2/2023
9. Volume
24,- EURO

GLOBAL RECYCLING

The Magazine for Business Opportunities & International Markets

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Recycling: There is Money in it – at all Stages

Brigitte Weber
Editor-in-Chief

Recycling is becoming increasingly relevant for the circular economy as an rising number of countries recognize its benefits for both economies and the climate. From collection, transport and sorting to recycling and recirculation based on the trade of secondary raw materials – companies involved in the recycling industry can make money. That applies also to the production sector. By using recycled materials and manufacturing products with the principle of design for recycling, the industry not only can achieve revenues, recycling also generates environmental benefits.

In May this year, the Bureau of International Recycling's (BIR) World Recycling Convention & Exhibition stressed the importance of the recycling sector, as the event was characterized by more than one as "milestone". The organizers registered 1,500 delegates (a sell-out and the largest ever attendance), the membership numbers are at a historic high of almost 1,000 (about 70 countries are represented through their national trade associations and individual companies), and the global federation of the recycling industries celebrated its 75th anniversary in Amsterdam where BIR was founded. But the focus at the event has been "on a modern, connected future which puts international recycling at the heart of the circular and global economy".

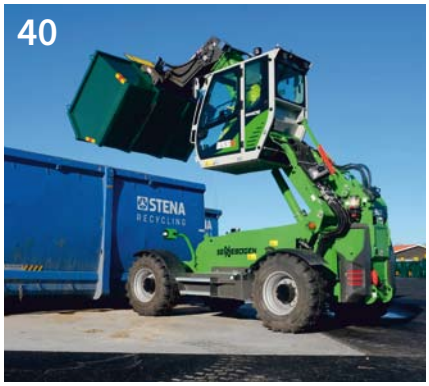
The importance of recycling is indicated, for instance, by the need for critical raw materials. According to a survey conducted by the Swedish Chalmers University of Technology and Swiss EMPA on behalf of the European Commission, as more and more electric cars are traveling on the roads of Europe, this is leading to an increase in the use of the critical metals required for components such as electric motors and electronics. "With the current raw material production levels there will not be enough of these metals in the future – not even if recycling increases," the university stated. The solution: more recycling as well as other measures to deal with the situation. At the meeting of the BIR International Environment Council, the security of supply regarding critical raw materials was an important topic (page 30). Globally, there are also initiatives: an extraction plant in Canada (Page 21) and a pilot recycling plant in Singapore (page 38), for example.

Circular economy is gaining ground in the construction sector as well. At the trade fair BAU 2023 in Munich, about 190,000 visitors informed themselves about the innovations and trends of the 2,260 exhibitors from 49 countries (page 31). And the European Recycling Industries' Confederation (EuRIC) has launched a new branch (page 32). The companies Sennebogen (page 40) and Kleemann (page 48) offer machines for recycling purposes, inter alia.

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



COLLABORATION TO DEVELOP CERTIFIED GLOBAL STANDARD FOR RECYCLING CREDITS

The new standard is intended to authenticate and incentivize recycling activity globally, enabling organizations to receive recycling credits and meet sustainability targets using the blockchain.

Following a landmark signing during the United Nations Environment Program's Second Session of the Intergovernmental Negotiating Committee on Plastic Pollution (INC-2) from 29 May to 2 June this year in Paris, BEEAH Group, the International Solid Waste Association (ISWA), and the management consultancy Roland Berger have entered a Memorandum of Understanding (MoU) to collaborate on a global standard for waste recycling. It has been endorsed by the UAE Ministry of Climate Change and Environment (MoCCaE). According to the announcement, the platform will create a global market-based incentive scheme and standard measure for recycling recognition and rewards, "which will bridge the gap between the global sustainability agenda and the private sector and push the transition towards a global circular economy". Developed using blockchain technology, the platform would aim to facilitate collaboration between jurisdictions and enable transparency across the waste management value chain.

The partnership is currently working out the standard's framework and technology. The platform is intended to be revealed at COP28 in Dubai (United Arab Emirates – UAE) between November 30 and December 12, 2023. The dedicated marketplace "will connect waste producers and waste management providers to create a virtuous loop. Organizations, which recycle waste with verified sustainable waste management providers receive Voluntary Recycling Credits (VRC)," the information says. Using the platform would enable them to track the recycling activities in a transparent and standardized process; furthermore, it would help to realize their sustainability targets.

Khaled Al Huraimel, Group CEO of BEEAH Group, pointed out that the future VRC platform would enable BEEAH to create new, sustainable efficiencies across businesses and industries for waste management. "This new recycling standard will make positive impact on sustainability targets within the UAE and globally. While incentivizing recycling and making large-scale impact on creating a circular economy, we are also innovating to add new value to organizations that are managing their waste sustainably, enabling them to offset emissions and track their contributions to the national sustainability agenda." According to the information, BEEAH Group is known for its zero-waste strategies and sustainability-driven technologies and set records for waste collection and landfill waste diversion in the Middle East. "The VRC standard is being developed ahead of COP28 in Dubai to help drive the UAE's climate ambitions and serve as a new global model to accelerate towards net-zero targets while creating a circular economy."

In March 2023, the International Panel on Climate Change (IPCC) highlighted that contributions from the waste management sector could result in the mitigation of 1.8 Gt (gigatons) of CO_2 emissions annually. As reported, this is possible through innovations across the waste management value chain and by limiting the usage of resources to manufacture virgin materials such as plastic.

- beeahgroup.com
- iswa.org
- rolandberger.com/en/

Photo: BEEAH

The MoU was signed by Firas Wahbeh (Chief Marketing Officer, BEEAH Group), Carlos RV Silva (President, ISWA), and Hani Tohme (Managing Partner at Roland Berger Dubai). The signing took place in the presence of Essa Abdulrahman Al Hashmi (Assistant Undersecretary, Sustainable Communities Sector, MoCCaE) and Rahma Alshamsi (Lead - Hard-to-Abate, Energy Transition Team, COP28 Committee, UAE Climate Envoy)

NEW ZEALAND'S TE RAUTAKI PARA / WASTE STRATEGY

In March this year, the New Zealand Ministry for the Environment published a new waste strategy for the country.

The document results from several initiatives including a consultation process, in which the New Zealanders could have their say on proposals to bring the country's recycling systems up to standard. Furthermore, the strategy had been prepared – inter alia – taking account of the government's decisions on waste and the circular economy, progress on individual projects across the waste work program, proposals to transform recycling, proposals for the new waste legislation, and the enhanced systems for managing investment to minimize waste. The same applied to emerging issues, including the rapidly growing interest in the potential of chemical recycling, waste-to-energy technologies and bio-economy and renewable energy possibilities.

The waste situation

In 2021, it was estimated that in Aotearoa (the current Māori-language name for New Zealand) the annually generated waste amounted to 17.49 million tons, of which an estimated volume of 12.59 million tons was sent to landfill. As per the Ministry for the Environment, this estimate includes waste disposed of in landfills, clean fills, and farm dumps. It would also include the materials recycled in New Zealand and those sent offshore for recycling.

Waste sent to "class 1" landfills (that accept household waste) had increased by 47 percent from 2,499,571 tons in 2009/2010 to 3,682,419 tons in 2018/2019, with per capita waste increasing from 580 kilograms to 740 kilograms per year. As reported by the ministry, there was a slight decrease in waste in "class 1" landfills in 2019 and 2020, with the decrease in 2020 mainly due to Covid-19. However, longer-term trends would suggest that the waste disposal rate would increase.

"Solid waste is not the only problem," Environment Minister David Parker wrote in the strategy document. "The way we produce, manage and dispose of things also generates emissions of greenhouse and other gases". In 2020, waste contributed to around four percent of the country's total greenhouse gas emissions and around nine percent of its biogenic methane emissions; 94 percent of these emissions were caused by decomposing organic material in landfills.

"Many of the products we use aren't built to be repaired, and, even when they are, it's often cheaper to throw them away and replace them, rather than source parts (if they're available)," the minister underlined. New Zealanders care about this and were rightly demanding change. "The waste sector agrees that change is needed and recognizes the opportunities from catching up with the world's best-performing countries." Therefore, the goal is to achieve the vision of Aotearoa New Zealand as a low-emission, low-waste society, embedding circular economy principles by 2050.

Photo: Bernd Hildebrandt / pixabay.com

The phases of getting rid of waste

In line with the strategy, there are three phases to achieve the planned circular economy:

- By 2030, New Zealand's systems are working well, and people's behavior is changing. More activity is circular, and the country produces less waste.
- By 2040, circular management of materials is normal, expected and well-supported. The amount of residual waste is low, while emissions and other environmental indicators are improving.
- By 2050, the country has reached its aim and is helping other countries make the change. While domestic systems are as circular as possible, New Zealand contributes to Pacific and international circular networks. The management of materials does not harm the environment.

Invest New Zealand

Invest New Zealand is managed by New Zealand Trade and Enterprise (NZTE), the New Zealand Government's international economic development agency. The members of the global investment team are focused "on building a vibrant investment market that is dedicated to supporting and growing a productive, sustainable and inclusive economy". They have a dual role: to help investors discover investment opportunities within New Zealand and connect local businesses with the knowledge and networks they need to raise capital and fund international growth.

nzte.govt.nz

Funding and investments

In order to enable the targeted change, eight objectives were formulated, which are to be realized by 2030.
Goal 1 involves new or improved systems for regulation, investment, planning and reporting, data collection, and more. Apparently, the waste disposal levy can generate significant funds to help achieve this strategy. "Other public funding is also made available for waste minimization initiatives from time to time," the Ministry for the Environment gave account. "Much of our work on establishing good underlying systems relates to ensuring we can effectively manage this funding and investment." The ministry had already redesigned the processes for its increased investment activity using the "Waste Minimisation Fund", "Plastics Innovation Fund" and Covid-19 recovery funding. The next step would be to align the central government investment framework to this strategy. Other priorities would include improving access to funding for Māori as well as attracting more investment partners and sources of capital, including other central and local government agencies and the private sector, to name but a few.

Another goal is getting the equipment and infrastructure in place that the country needs for a coherent, nationwide network of facilities for the collection and circular management of products and materials. The New Zealand Government provided funding for new and upgraded infrastructure in recent years, but further investments are necessary. According to the information provided by the strategy document, between two billion New Zealand Dollar (about 1.3 billion US-Dollar) and three billion New Zealand Dollar (nearly 1.9 billion US-Dollar) would be required by 2030. "The revenue generated by the expanded waste disposal levy provides a good start for the investment needed in circular resource infrastructure, but we cannot wait for the levy to generate that level of funding on its own," the ministry wrote. "Because the private sector participates extensively in the waste management sector, it is appropriate that it also invests in the solutions. In general, public funding should be used to fill gaps or kickstart facilities and services that the market struggles to provide; it should not displace private sector investment and activity."

Circular resource management is a growth area with significant scope for innovation, the ministry underlined. Opportunities would exist for iwi (the tribal entities of the Māori people) and other new investors to get involved and support new infrastructure, industries and jobs, locally and regionally. "Central Government will manage the investment

The strategy and te ao Māori

Circular economy thinking would share many underlying values with te ao Māori (the term denotes the Māori World), the authors of the strategy document informed. "At a practical level, both focus on not creating waste in the first place and cycles of continual regeneration." In te ao Māori the fundamental concept of whakapapa is closely linked and adds further richness. "Whakapapa can be broadly described as the kinship between all living things: past, present and future. Whakapapa not only exists between people but between people and the planet. That kinship creates connection, respect and responsibility."

Source: Ministry for the Environment Manatū Mō Te Taiao

of its levy funds to leverage funding from other sources and work with other Government investment vehicles, where appropriate."

Recovery Systems

A further aim is dedicated to recycling and involves creating a consistent recycling service across the country for materials. One of the priorities is to simplify material streams so more can be recycled. The government can support change in this area by:

- encouraging and funding research and innovation on better ways to use recyclable materials;
- setting design standards that control the composition of some products or packaging (this is included in the proposed new waste legislation);
- requiring manufacturers and suppliers to provide consumers with clear information on recyclability, so they can make informed choices when they buy things, which will create pressure for businesses to change;
- removing hard-to-recycle materials from the national economy.

Apart from strengthening the collection systems and services across the country and getting New Zealanders recycling correctly, the market demand for recycled materials is a priority in this area. "Currently, there are few or no takers for some recycled materials; for other materials the markets are volatile. However, in some cases (such as metal), the market is reasonably effective and stable," the ministry stated. That would be another area where everyone has a role. Customers at any stage of a supply chain could have an influence. "For example, businesses that manufacture things, or use packaging, can demand materials that contain more recycled content." In addition, the government could fund research and innovation, which supports markets and infrastructure that supply or use recycled material. The proposed new waste legislation would also give power to the government to require a proportion of recycled content in specified products.

Since waste management organizations are the primary investors in waste collection and processing infrastructure and facilities, they "need a reliable supply of material to recycle, affordable technology to process it, and a steady demand for what it produces". At present, "this balance is fragile, but the changes set out in this strategy should redress that balance over time". Finally, yet importantly, the New Zealand Government is looking for ways to recover any remaining value from residual waste that cannot be recycled and is destined for final disposal. "Although recovering value is near the bottom of the waste hierarchy and should not displace options further up, we will continue to have residual waste for some time. This is a challenging area that we must approach cautiously, but if we can use truly residual waste without harming the environment we should do so." The opinion forming regarding a balanced and consistent approach to recovering value from waste across government and industry strategies, policies and actions is not yet completed.

The New Zealand waste strategy: 🌐 environment.govt.nz/publications/te-rautaki-para-waste-strategy/

Tender Services

The Government Electronic Tender Service – GETS – is a free service designed to promote open, fair competition for New Zealand Government contract opportunities. New Zealand public sector agencies use GETS to advertise tenders and manage the tender process. Some agencies are mandated to use GETS for large tender opportunities, the website informs (🌐 procurement.govt.nz/suppliers/gets/). Suppliers need to register for GETS using an individual RealMe login. More tenders regarding New Zealand can be found here:
🌐 tendersontime.com/new-zealand-tenders/treatment-plant-tenders/
🌐 illion.tenderlink.com/tenders/waste-management-&-landfill/australasia/new-zealand/
🌐 globaltenders.com/new-zealand/

USA:

ALLIANCEBERNSTEIN LAUNCHES THREE NEW ACTIVE EQUITY ETFS

In March this year, AllianceBernstein Holding L.P. (AB) and AllianceBernstein L.P., a leading global investment management and research firm, announced the launch of three new active exchange-traded funds (ETFs) on the New York Stock Exchange (NYSE).

Global liquidity provider Citadel Securities would be the Lead Market Maker on these products, "bringing extensive industry experience and pricing expertise to AB's ETF suite".

"Drawing upon the success of our inaugural ETFs launched in 2022, this new suite of Equity ETFs demonstrates our commitment to delivering best-in-class investment strategies in adaptable and accessible vehicles for all investors," Global Head of ETFs and Portfolio Solutions Noel Archard was cited. "Our clients look to us for unique capital market insights across market cycles, and to introduce products that allow them to best manage their portfolios across evergreen investment themes like growth or income generation."

The new active ETFs include:

- The AB US Low Volatility Equity ETF [NYSE: LOWV] is an actively managed ETF whose objective is capital appreciation focusing on lower volatility compared to the broader US equity market.
- The AB US High Dividend ETF [NYSE: HIDV] is an actively managed ETF that seeks to provide current income as well as long-term growth of capital. In pursuing the fund's objective, AB utilizes a systematic approach to identify attractive US companies that pay dividends and have the potential for long-term capital generation. The fund may also invest in non-dividend paying companies.
- The AB Disruptors ETF [NYSE: FWD] is an actively managed ETF that seeks long-term capital growth by investing in a global portfolio of equity securities. In pursuing the fund's objective, AB seeks to invest in "disruptive" innovation leaders. The fund may invest in any sector or industry.

alliancebernstein.com/go/etfs

North Macedonia:

INVESTMENT GRANT TO BUILD A WASTEWATER TREATMENT PLANT

EIB Global, the arm of the European Investment Bank (EIB) for activities outside the European Union, has signed a 70 million Euro EU investment grant with the government of the Republic of North Macedonia to build a wastewater treatment plant in Skopje.

Signed on World Water Day in March, this is the largest EU investment grant allocated to the country under the Western Balkans Investment Framework (WBIF), EIB informed. This environmental project would be part of the European Commission's Economic and Investment Plan and the Green Agenda for the Western Balkans. It is being financed by EIB Global's 68 million Euro worth loan, complemented with funds from the European Bank for Reconstruction and Development, the government of North Macedonia, and EU grants channeled through the WBIF.

The EIB is one of the world's biggest public lenders in the sector. On average, it finances three billion Euro in water infrastructure annualy, focusing on water security and climate change adaptation. "Around 30 percent of EIB water projects are carried out outside the European Union, including in some of the world's poorest and most drought-stricken countries," the bank gave account. "Projects financed alongside regional partners connect cities and villages to clean water and sanitation, enable flood-resistant infrastructure, and encourage communities to recycle their water." In the Western Balkans, the EIB has provided "close to 750 million Euro for water and sewage infrastructure, improving inhabitants' access to drinking water and sanitation services". The European Investment Bank is looking for possibilities to expand its investments in this sector in line with the latest EU initiative "Global Gateway", aiming to mobilize up to 300 billion Euro for sustainable infrastructure projects worldwide.

eib.org/en/infocentre/contact/offices/index.htm

Study:

INVESTMENT GAP TO MEET EU'S PLASTICS RECYCLING TARGETS

In March, the European Investment Bank (EIB) published a new study titled "Cutting plastics pollution – Financial measures for a more circular value chain".

The authors have analyzed the inefficiencies of the plastics value chain and their solutions in the European Union. Furthermore, they examined ten root causes of the plastic waste problem and identified investment opportunities and policy measures "that will help address the world's growing plastic crisis". According to EIB, implementing a fully circular economy in plastics is essential in the face of the ever-increasing complexity of the underlying compounds. "In the global context, the European Union is performing comparatively well in addressing plastic waste pollution and has set itself ambitious targets under the European Strategy for Plastics," the authors stated. Nevertheless, they found out that an estimated investment gap of 6.7 to 8.6 billion Euro had to be closed to achieve Europe's pledged goal of placing on the EU market each year 10 million metric tons of plastic recyclates in final products by 2025. "Achieving these targets requires substantial investment and a reliable end market for the recycled content. The largest gaps in sorting and recycling are identified in EU cohesion regions, centered on Central and Eastern Europe and South-East Europe."

Given the complexities of the plastics value chain, many of the necessary improvements would require policy measures combined with targeted financial instruments. "Policy recommendations by the study include legislative measures to tackle difficult-to-recycle plastics packaging, restrictions on composite packaging (such as packaging combining paper and plastics) and imposing quotas on recycling while boosting public awareness campaigns."

The report, carried out by the Bank's Innovation & Digital Finance Advisory division under the InnovFin Advisory mandate from the European Commission, also comprises financial recommendations to address the problem of plastic waste pollution both within and outside the European Union. These would include loans to corporate and mid-cap companies, municipalities, and local authorities as well as support to research, development, and innovation activities, EIB emphasized.

About InnovFin

"InnovFin – EU Finance for Innovators" is a joint initiative launched by the European Investment Bank Group (European Investment Bank and European Investment Fund) in cooperation with the European Commission under Horizon 2020. It aims to facilitate and accelerate access to finance for innovative businesses and other innovative entities in Europe.

InnovFin Advisory assists eligible public and private counterparts to improve the bankability and investment readiness of large, complex, innovative projects that need substantial long-term investments.

eib.org/en/publications/20220248-cutting-plastics-pollution

AUSTRALASIAN WASTE & RECYCLING EXPO

July 26 – 27, 2023, Sydney (Australia)

Australasian Waste & Recycling Expo, the business event for the waste recycling and resource recovery sector, allows waste professionals to showcase their services, introduce new products, and reach potential customers. The event is awaited yearly by hard-to-reach decision-makers seeking product innovations and conducting business exchanges. The organizers of AWRE highlighted that the event facilitates industry connections 365 days a year through various digital channels. The digital content showcases industry trends, innovations, and technological advances demonstrating the Australian waste and recycling industry's advanced sustainability practices.

awre.com.au

NAVIGATION TOOL REGARDING PLASTIC RECYCLING

The European project TRANSFORM-CE, funded by Interreg North-West Europe, has presented a tool to transform single-use plastic into new products for a circular economy.

The Navigation Tool results from a three-year project, in which international partners from Belgium, Germany, the Netherlands and the United Kingdom collaborated to recycle high-value and low-value household plastic waste streams. It gives information on the TRANSFORM-CE project's findings, shares links to project reports and publications, gives the contact details of the project's partners for questions or collaboration, explains the technologies, and suggests uses for recycled plastics. TRANSFORM-CE uses two technologies: additive manufacturing

(AM) and intrusion-extrusion molding (IEM).

- AM shreds sorted plastic waste, which is then melted and extruded to produce long filaments. The filaments are then used in 3D printing to create objects layer by layer.
- In IEM, low-grade plastic waste is used to make lumps of plastic which are then melted and extruded into a hot plastic 'clay'. That is then pressed into molds to create new products. In the TRANSFORM-CE project, the Green Plastic Factory in the Netherlands is responsible for the process.

As reported, TRANSFORM-CE offers a business support package for companies interested in using recycled materials. "The technologies can be used to design and produce new products and to create circular business models."

The Navigation Tool can be found on the project homepage: nweurope.eu/projects/project-search/transform-ce-transforming-single-use-plastic-waste-into-additive-manufacturing-and-intrusion-extrusion-moulding-feedstocks-and-creating-a-new-circular-economy-model-for-nwe/#tab-9

Source: Interreg North-West Europe

CIRCULAR PLASTICS FUND WELCOMES NEW INVESTORS

In April this year, Infinity Recycling announced the successful closing of a new round of commitments to their Circular Plastics Fund.

The Luxembourg-registered Circular Plastics Fund (CPF) has an initial target size of 150 million Euros, which is an Article 9 "dark green" impact fund, under the EU's Sustainable Finance Disclosure Regulation. Its investments aim to accelerate the transition to a circular economy of plastics by scaling up advanced recycling technology companies that transform plastic waste streams into primary commodities used for producing new plastics. Infinity Recycling, based in the Netherlands, was established to create markets for end-of-life waste streams by investing in waste valorization technologies. Their first offering was the Circular Plastic Fund. It "catalyzes the world's transition to a closed-loop plastics economy in which residual polymer waste streams, representing over 85 percent of the global plastic waste, are converted into building blocks for the manufacturing of new plastics," the firm emphasized. "The Fund's strategy aims to significantly reduce the carbon footprint of the plastics economy and contribute to eliminating the world's plastic waste problem."

Since its first closing in February 2022, the Fund has made five investments. "Building on investor interest and deployment momentum, the Fund is well on its way to a final closing, projected for the second half of this year," Infinity Recycling informed.

infinity-recycling.com

ENHANCING THE QUALITY OF MECHANICALLY RECYCLED PLASTICS

Dow has developed a washing technology called EVOWASH. According to the company, it supports "high-quality mechanical recycling for the production of exceptional post-consumer-recycled (PCR) plastic resins that meet the expectations of customers – mainly those in the packaging industry – while minimizing the commercial risk and investment of resources to develop a robust mechanical recycling infrastructure". The product would allow advancing the quality of recycled plastic by working in four dimensions:

- Surface Cleaning: Up to twice as much adhesive removal compared to other technologies.
- Optical Quality: Improving their physical appearance in terms of colors, neutral tones, and luminosity. Moreover, further closing the gap between recycled and virgin packaging.
- Foam Management: Up to three times less dosage, which reduces product usage and thus cost-efficiency.
- Odor Control: Reducing undesired odors.

dow.com/en-us/brand/evowash.html

PLASTICS RECYCLING SHOW MIDDLE EAST & AFRICA 2023

September 5 – 7, 2023, Dubai (United Arab Emirates)

The goal of PRS ME&A is to provide attendees with up-to-date information and technological advancements in the rapidly evolving plastics recycling industry. The event will bring together industry leaders, innovators, and technology providers. It will also feature an exhibition showcasing the latest solutions and technologies available on the market. Furthermore, the conference will cover important topics such as the circular economy, regulations, challenges, opportunities, innovations, technologies, and trends in the plastics sector. International experts will share their insights and experiences, promoting a sustainable and environmentally friendly future.

prseventmea.com/prsmea2023/en/page/home

GLOBAL BLACK MASS RECYCLING MARKET SET TO SURGE

USA-based market research and consulting firm InsighAce Analytic has released a market assessment report on the global black mass recycling market. “Black mass” is the industry term used to describe a type of e-waste comprising crushed and shredded end-of-life batteries, which contains mixtures of metals including lithium, manganese, cobalt and nickel. According to InsighAce Analytic, this market is estimated to reach more than 51.22 billion US-Dollar by 2031, exhibiting a compound annual growth rate (CAGR) of 20.74 percent during the forecast period.

“Black mass recycling has a significant industry impact since it offers several economic and environmental advantages,” the company gave account. “Also, it has a considerable impact on end-use industries since it offers a variety of advantages that can boost their productivity, reduce their expenses, and give them a reliable source of essential metals.” The market for recycling black matter would be expanding on a global scale. “In the upcoming years, new trends are also anticipated to offer opportunities for the market to expand, including rising investments in recycling technologies, increased demand for second-life batteries, changes in business models caused by climate action, rising demand for lithium-ion batteries and raw materials throughout the value chain, and advancements in economic and environmental technologies.”

However, there are also challenges. The most difficult stage in the recycling process is the hydrometallurgical step. The non-uniform composition of dark matter is one issue. Depending on the battery’s usage history and the battery chemistry used by each manufacturer, various degraded compounds may be present, the market research company described the situation. The hydro-process had to be extremely reliable as a result. “Reaching battery grade qualification even with great effort is difficult, if not economically impossible. Yet, a lot of recycling process inventors assert that their recycled products may meet battery-grade criteria. This begs the obvious issue of why lithium has not yet been recycled into new batteries. Results obtained at the bench under ideal circumstances are simply not applicable to industrial-scale recycling. Hence, the factors mentioned above are acting as a challenge for the market’s growth.”

insightaceanalytic.com/customisation/1680

STUDY AND PILOTS FOR AFRICAN COUNTRIES UNDERWAY

A study and pilot to establish if a digital waste management solution could improve waste collection and recycling in Southern Africa, starting with Angola and Mozambique, is underway by Circular Action. The five-month-long study builds on Circular Action’s experience of waste management in developing countries and its project using the KOLEKT waste management app in Brazil, Vietnam, Mexico and Mozambique. This African study is funded by the European Union Africa RISE (Reform for Investment and Sustainable Economies) program, and involves National Waste Agency [NWA] Angola and AMOR Mozambique, where the study and pilot project are being carried out.

circular-action.com

ALPLAindustrial:

NEW BRAND FOR LARGE-VOLUME CONTAINERS

Photo: ALPLA

Since May, the internationally active ALPLA Group has been marketing all activities relating to large-volume plastic packaging for industrial and commercial use, such as buckets, canisters and their closure systems, under the ALPLAindustrial brand. According to ALPLA, one of the world's leading companies in the production and recycling of plastic packaging, more than a year after the takeover of Wolf Plastics, the firm is consolidating the portfolio of the subsidiary. "Since autumn 2021, the ALPLA Group has supplied major international customers from the food, chemical, and construction industries with high-quality plastic buckets, canisters, bottles, and closures through its subsidiary Wolf Plastics." It was now concentrating its line of products under the new ALPLAindustrial brand, intensifying its commitment to large-volume plastic packaging for industry and professional use. "The corporate identity of Wolf Plastics will change to ALPLAindustrial over the course of the year," the Austria-based company announced.

alpla.com/en

EUROPEAN INVESTMENT BANK SUPPORTS PORTUGUESE WASTE MANAGEMENT

The European Investment Bank (EIB) has granted a 100 million Euro loan to EGF, the company responsible for the treatment and recovery of urban waste in 174 municipalities in Portugal, to support waste management projects in the country. In March this year, the loan agreement was ratified in Lisbon. As stated, the committed financing will make it possible to increase and improve the selective collection of urban waste and the modernization of triage and organic recycling centers. Furthermore, it would provide a way to meet the targets of the recently announced National Strategic Plan for Urban Waste in Portugal (PERSU 2030). In addition, a significant part of the committed financing will benefit cohesion regions.

COLLABORATION TO REALIZE FUTURE TRUSTYRENYX PLANT

INEOS Styrolution America LLC and Norway-based Agilyx ASA have informed that they are advancing the development of a previously announced 100 tons per day TruStyrenyx chemical recycling facility in Channahon, Illinois. TruStyrenyx is a partnership between Agilyx and Dutch Technip Energies. The technology provides an all-in-one solution for the chemical recycling of polystyrene back into high-purity styrene monomer, which could be used to make new, food-grade plastic products or packaging. Under the agreement, both companies would collaborate with INEOS Styrolution "and together develop the design and engineering that will serve as the basis for constructing the chemical recycling facility". The group anticipates the completion of engineering in 2023, which will form the basis for a financial investment decision.

ineos-styrolution.com
agilyx.com
technipenergies.com/en

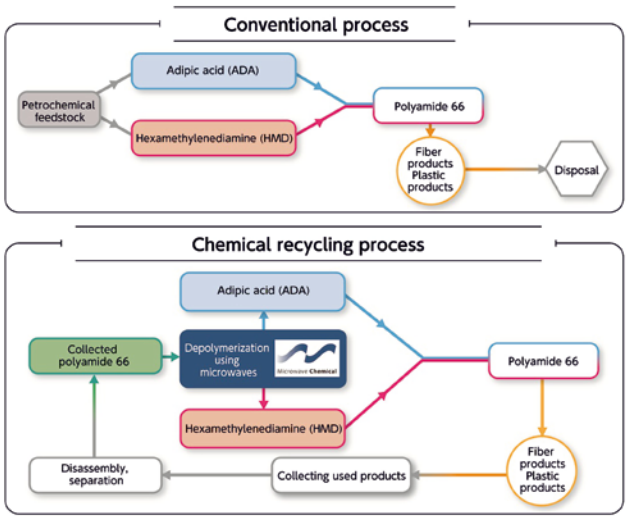
DEMONSTRATION PROJECT FOR CHEMICAL RECYCLING USING MICROWAVE-BASED TECHNOLOGY

In April this year, Japan-based companies Asahi Kasei and Microwave Chemical launched a joint demonstration project with the objective of commercializing a chemical recycling process for polyamide 66 using microwave technology.

As reported by a joint press release, in the demonstration, scraps from manufacturing and post-use waste material of PA66 for airbags and automobile parts are depolymerized. “The process utilizes microwaves to depolymerize PA66 and directly obtain the monomers hexamethylenediamine (HMD) and adipic acid (ADA), which is expected to be accomplished at high yield with low energy consumption. The monomers obtained can then be used to manufacture new PA66.”

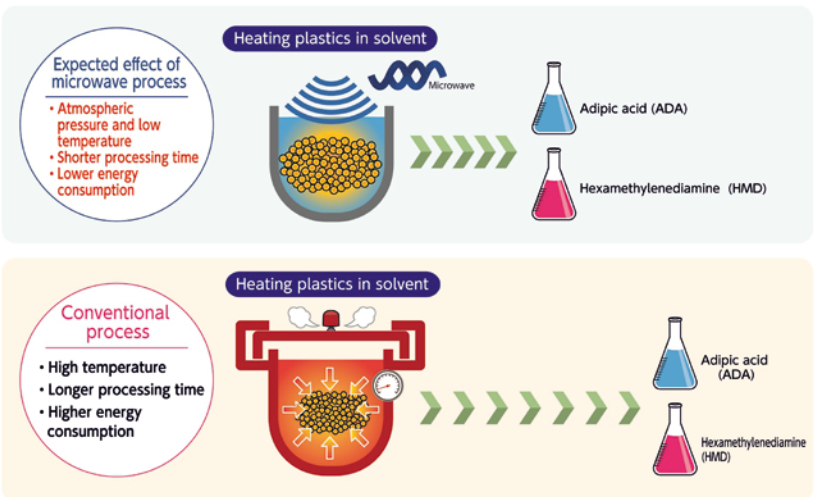
Asahi Kasei currently produces fossil fuel–derived HMD and ADA as intermediates to manufacture Leona PA66, an engineering plastic featuring heat resistance and rigidity. “PA66 is used in various applications, including plastic parts for automotive and electronic products, and yarn for airbag fabric, and its demand is expected to increase worldwide,” the companies informed. “As the world moves toward carbon neutrality, attention is increasingly focused on manufacturing processes for reducing greenhouse gas (GHG) emissions from chemical products derived from fossil fuels.” Microwave Chemical was promoting technological and business development to achieve carbon neutrality in the industrial sector focused on process development using microwaves, which can directly and selectively heat target substances with high energy efficiency. “For chemical recycling, Microwave Chemical is advancing its proprietary PlaWave technology platform for decomposing plastic using microwaves.”

Comparison of conventional polyamide 66 manufacturing process with chemical recycling



Through development combining Asahi Kasei’s experience in manufacturing HMD and ADA together with Microwave Chemical’s achievements in the industrialization of microwave technology, the two companies aim to commercialize a manufacturing process for PA66 that can reduce GHG emissions compared to the conventional manufacturing process. “Laboratory-scale studies that began in fiscal 2021 have confirmed the high-yield depolymerization of PA66 using microwaves, as well as the principle of the separation and purification process after depolymerization,” the collaboration partners underlined. Bench-scale equipment would now be assembled at Microwave Chemical’s Osaka Factory by the end of the fiscal year 2023

Chemical decomposition of polyamide 66 using microwave technology



Source: Asahi Kasei

(ending March 2024), and a small-scale demonstration trial using this equipment would be performed in the fiscal year 2024 to collect basic process data for commercialization.

Microwave Chemical's PlaWave technology platform for decomposing plastic using microwaves can depolymerize PA66 with low energy and obtain HMD and ADA monomers in high yield, the information said. The manufacturing process for PA66 with this technology is expected to reduce GHG emissions compared to the conventional PA66 manufacturing process. Further reducing GHG emissions may be achieved by using renewable energy for the power required to generate microwaves. By verifying the process in an integrated manner, the demonstration project would aim to enable resource circulation of PA66 for further reducing GHG emissions. "Moving forward, based on the results of the small-scale demonstration trial, a decision on the possibility of commercialization will be made by fiscal 2025 following detailed analysis. Concurrently with the small-scale demonstration trial, construction of a business model that involves the entire value chain in the chemical recycling of PA66 will be advanced, aiming to achieve a circular economy together with stakeholders in the PA66 value chain."

Asahi Kasei, by its own account, aims to be a global partner for its PA66 customers by providing optimal solutions for their carbon neutrality initiatives through studies of the practical application of material recycling and chemical recycling as well as trials for the commercialization of PA66 made using biomass-derived intermediates. Microwave Chemical is working to increase the scale of equipment and to make PlaWave more generally applicable to achieve the practical application of the chemical recycling of polymethyl methacrylate (PMMA, also called acrylic resin), automotive shredder residue (ASR), plastic containers and packaging, flexible polyurethane foam, and so on.

asahi-kasei.com
mwcc.jp/en

PureCycle:
PURIFICATION PLANT REACHES MECHANICAL COMPLETION

PureCycle Technologies, Inc. announced it reached mechanical completion of its first polypropylene purification plant in Ironton (Ohio, USA). In May, the company informed that it received formal certification of mechanical completion from the site's independent construction monitor. "The formal certification came three days after PureCycle submitted its documentation to the engineering company." The evaluation is required to achieve the first key milestone in connection with PureCycle's Ironton financings.

Photo: PureCycle

The Ironton facility was anticipated to commence in the second quarter of 2023, the company gave account. Once fully operational, it would be expected to produce 107 million pounds (more than 48 metric tons) of Ultra-Pure Recycled (UPR) resin annually, making high-quality recycled PP plastic more accessible at scale. PureCycle Technologies LLC., a subsidiary of PureCycle Technologies, Inc., holds a global license for the patented solvent-driven purification recycling technology, developed by The Procter & Gamble Company (P&G), "that is designed to transform polypropylene plastic waste (designated as No. 5 plastic) into a continuously renewable resource". The purification process would remove color, odor, and other impurities from No. 5 plastic waste "resulting in an ultra-pure recycled (UPR) plastic that can be recycled and reused multiple times".

purecycle.com

PRODUCING REFUSE-DERIVED FUEL IN MEXICO

Since waste, including industrial waste, is frequently disposed of in landfill sites in Mexico, the company Regenera, a Cemex subsidiary, currently concentrates on developing circular economy solutions. Here, the company trusts in Lindner's shredding experience, the provider pointed out.

Mexico is not only known to be the fifth largest country in the Americas, but with a population of around 129 million people, it ranks tenth worldwide and is the most densely populated Spanish-speaking country. Not least because of its large population, Mexico produces 100,000 tons of waste every day. Most of it is still landfilled – with dramatic consequences for the environment. Therefore, Regenera has committed itself to collecting and recovering waste and has established more than ten waste collection centers throughout Mexico. The focus, however, is not only on collecting but also on expertly recovering waste. While some types of waste can be successfully recycled, non-recyclables are used to produce high-quality refuse-derived fuel (RDF).

Producing refuse-derived fuel

At its flagship plant, the Monterrey waste recovery facility, Regenera relies on the experience of Lindner and its sales & service partner GTA Ambiental to help to produce refuse-derived fuel. "We chose Lindner because these shredders can be used and installed flexibly without any major changes to our facilities. We were also looking for robust machines capable of processing the different types of waste we receive, and, at the same time, an after-sales service team that ensures continuous plant operation," José Guillermo Díaz Arroyo, Director at Regenera was cited.

Photos: Lindner Recyclingtech

Reducing landfilling

From 2011 to December 2022, Regenera recovered more than 4.9 million metric tons of municipal solid, industrial and commercial waste, thereby notably reducing landfilling. The resulting refuse-derived fuel is produced specifically for energy recovery in cement plants and must meet high-quality standards. These vital criteria include density, energy and moisture content, and particle size – a challenge Lindner's technology and GTA Ambiental can handle. By producing high-calorific refuse-derived fuels Regenera also actively contributes to reducing the carbon footprint. By 2050, Cemex, the parent company, aims to neutralize these emissions, which is also the focus of the Future in Action initiative, a sustainability program founded by the firm. The objective is to play a pioneering role in climate protection within this industry.

cemex.com/products-solutions/regenera
lindner.com

NEW RECYCLING PLANT IN VIETNAM

Alba Group Asia and VietCycle intend to develop the largest food-grade PET/HDPE plastic recycling plant in Vietnam.

For that purpose, Alba Group Asia, one of the leading providers of waste management and recycling solutions with German origin, and VietCycle, a firm with more than 20 years of experience in waste collection and plastic recycling in Vietnam, have signed a cooperation agreement.

Both companies plan to develop a facility, which will have an estimated capital expenditure (CAPEX) of up to 50 million US-Dollar and a capacity of up to 48,000 tons/year. In the plant, advanced technology would be used to produce food-grade PET/HDPE resin to meet international standards set by the EU and adopted by many multinational corporations. The first phase of operations is expected to start in 2024/25.

Photo: Alba Group Asia

Dr. Axel Schweitzer (Chairman and Shareholder of ALBA Group Asia), Dr. Simon Kreye (Deputy German Ambassador), Tobias Huinink (Business Director Asia ALBA Group Asia), Nguyen Van Tuan (Director of VietCycle), Hoang Van Thuc (General Director of the Department of Pollution Control, Ministry of Natural Resources and Environment), Hoang Duc Vuong (Chairman of VietCycle Joint Stock Company), f.l.

The partnership would enable the expansion of VietCycle's network, "which will rapidly increase the number of informal waste collectors across Vietnam. Gender equality and social inclusion in the plastics recycling sector are among the key goals that the partnership is aiming to achieve", a joint press release said. "Besides the promising business partnership, its economic effects, and the substantial contribution to Vietnam's effort to combat climate change, the expansion will allow both Alba and VietCycle to reach out to more disadvantaged collectors and improve their lives by providing them with training and social insurance benefits. For this purpose, the Alba Berlin Academy Asia, which was founded by the Berlin basketball club and is already active in ten countries, is to be integrated to combine existing offers with its school, sports, and training program."

alba.com
vietcycle.vn

TADWEER AND POLYGREEN HAVE SET AMBITIOUS GOALS

In May this year, Tadweer (Abu Dhabi Waste Management Company) has entered into a strategic partnership with internationally active Greek company Polygreen. Through a Memorandum of Understanding (MoU), the two organizations will collaborate to explore opportunities to achieve zero waste, circular economy and sustainability in the United Arab Emirates (UAE), Greece, and beyond. "In addition to exchanging knowledge and best practices, they will collaborate on high-profile global events such as COP28, UN events, and Delphi Economic Forum," the information said. "The partnership will also explore harnessing Polygreen's 'Just Go Zero' model in Abu Dhabi, which focuses on engaging with local stakeholders to achieve zero waste in the Emirate." According to Polygreen, the MoU follows the agreement signed last year between the UAE and Greece. It would center on establishing an investment framework worth four billion Euros between Abu Dhabi-based investment and holding company ADQ and the Hellenic Development Bank (HDB), the national development bank of Greece, and the Hellenic Development Bank of Investments (HDBI).

Estonia:

NEW MAGNET FACTORY

International company Neo Performance Materials (NPM), which owns Estonia-based rear earth metals maker Silmet, intends to construct a magnet factory and R&D center in Narva. According to the Estonian Investment Agency, the company is set to invest 81.25 million Euro, and Estonia will add 18.75 million Euro through the Just Transition Fund. “The facility is believed to transform the region’s economy, providing jobs and paving the way to a clean energy transition.”

The Canada-based investor expects the construction launch of the planned magnet facility in Ida Viru County in 2023 and the onset of manufacturing operations in 2025. Once in operation, the European magnet plant is seen as a key component of NPM’s rapidly advancing “Magnets-to-Mine” vertical integration strategy.

The first phase of the planned facility would be designed to produce approximately 2,000 tons/year of sintered rare earth permanent magnet block, NPM announced. The plan is to integrate recycling into its operations to maximize the circular economics of the plant.

The company has been in advanced commercial discussions for several years with multiple magnet customers in Europe. That indicates a level of demand for sintered rare earth magnets that far exceeds the planned phase 1 production capacity. Therefore, the company is considering plans to increase the facility’s capacity to 5,000 tons/year in a phase 2 expansion, depending upon market conditions and other factors.

According to media reports, the plant will also be Estonia’s first climate-proofing project. Inogen Alliance Associate DGE’s Estonian partner Hendrikson was set to provide climate-proofing services. Inogen Alliance is a global network with dozens of independent local businesses and over 5,000 consultants worldwide.

neomaterials.com

MAXIMUM ALUMINIUM PURITY FOR THE CIRCULAR ECONOMY

In order to conserve resources, we need to reuse raw materials as often as possible. That requires recycling material flows that have the highest and most consistent quality possible. It is only with efficient sorting technology that resources can be continually recycled. The STEINERT XSS T uses X-ray transmission (or XRT for short) to reliably achieve extremely high purity levels when recycling aluminum. EVO 5.0 is the latest evolutionary stage. Customers explain here why they are so impressed with the equipment. More and more companies are looking to save resources and expand their use of secondary raw materials. STEINERT has long been an important partner to metal recycling firms. Its technology for dry density separation has been successfully established for several years now. The systems are based on x-ray transmission and are designed especially for separating heavy and light metals in metal processing. The STEINERT XSS T produces extremely pure aluminum. The sorting equipment's detection rates are so precise that it can achieve an aluminum purity of 99.8 percent.

A STEINERT XSS T EVO 5.0 at Scanmetals produces ultra-pure aluminum. Heavy metals are sorted out

The software and design of the STEINERT XSS T EVO 5.0 sorting system make it particularly durable and robust

Sorting from incinerator bottom ash residue

The Scanmetals group of companies has three sites in Europe where it produces non-ferrous metals out of incinerator bottom ash (IBA) from waste incineration plants. The cleaned and separated metal fractions are sold around the globe to primary and secondary smelters, refineries, foundries and mills.

The Danish company gets all its sorting solutions for non-ferrous metals from STEINERT. The owner, Ejvind Pedersen, likes the fact that this centralized method of procurement saves time, allowing him to concentrate on developing innovative recycling ideas. Pedersen compares the efficiency and reliability of STEINERT with that of German automotive manufacturers. He stresses the confidence that his production staff has in the equipment and how easy the technical components are to operate.

Photos: STEINERT

It's about more than price alone

The Stena Recycling group of companies has a network of 178 recycling plants in Europe and employs more than 3,500 people. Every year, Stena recycles over six million tons of complex waste materials. The Stena Nordic Recycling Center handles 500,000 tons of complex materials annually, saving 870,000 tons of emissions.

Jesper Fournaise, Outbound Sales Manager at Stena Recycling S/A, is responsible for the production and sale of aluminium. "We're the green gods," is how Fournaise describes his team. By this, he means that scrap is converted into recyclable material that is fed back into the production cycle.

According to Fournaise, for a long while, it has not just been about the sales price of a metal: "Our customers, the smelters, save CO_2 by using secondary raw materials and sorting is one of the most important primary stages. Because we strive for qualities similar to those of primary aluminum, we opted for sorting technology from Steinert. Steinert simply delivers the exact values we need."

steinertglobal.com

MICROSOFT CLIMATE INNOVATION FUND INVESTED IN AMP ROBOTICS

New capital to fuel the ongoing transformation of recycling with AI and automation.

USA-based AMP Robotics Corp., a company in artificial intelligence (AI), robotics, and infrastructure for the waste and recycling industry, has received financing from Microsoft's Climate Innovation Fund. According to the developer of AI-enabled solutions, this latest investment brings AMP's Series C round – led by Congruent Ventures and Wellington Management – to a total of more than 90 million US-Dollar.

With its Series C funding, AMP is scaling its operations, including deploying technology solutions to retrofit existing recycling infrastructure and expanding new infrastructure based on its application of AI-powered automation. The company recently unveiled a compact, AI-enabled automated sortation solution – AMP Cortex-C – along with an integrated, standalone facility offering for waste management companies. These developments follow the launch of AMP Vortex to tackle film contamination and improve the recovery of film and flexible packaging.

AMP's AI platform identified nearly 75 billion objects in 2022 alone, the company informed in May this year. In addition to developing AI-enabled solutions, it also designs, builds out, operates, and services new facilities powered by its application of AI for material identification and advanced automation for waste industry customers. "With hundreds of deployments across North America, Asia, and Europe, AMP's technology recovers plastics, paper, and metals from municipal collection, precious commodities from electronic scrap, high-value materials from construction and demolition debris, and valuable feedstocks from organic material," the firm underlined.

amprobotics.com

Photo: AMP Robotics

Gopher Resource:

DEVELOPMENT WORK WITH PARTNERS

North American recycling company Gopher Resource has joined a multi-year collaborative consortium working to find new ways to reduce waste and recover more usable materials in metal processing.

The initiative – funded by the U.S. Department of Defense (DOD) – aims to support a more resilient and sustainable domestic supply chain by investing in next-generation metal recycling technologies. As reported, the effort is part of the "Materials Recovery Technologies for Defense Supply Resiliency (MRT-DSR) run through Army Research Labs (ARL), supporting President Biden's 2021 Executive Order on America's Supply Chains". The consortium consists of five industry members and seven U.S. and international universities. "Gopher Resource will leverage its expertise to facilitate seven projects focused on greenhouse gas (GHG) reduction, critical metals recovery, and waste valorization/minimization," the company informed. These efforts would support the nearshoring of the country's supply chain by developing recycling technologies for recovering critical metals with improved environmental standards.

To date, the consortium has received over 15 million US-Dollar in congressional funding from a 25 million US-Dollar ceiling, with more than five million US-Dollar secured for the projects Gopher Resource will be facilitating. The first project, already underway, is using advanced heat transfer technology from the solar energy industry to recover waste heat during the recycling process, making it more energy efficient. "This is an industry first for the novel technique and Gopher Resource is working with partners to commercialize this technology." For the second project, the company is working with the University of Minnesota Natural Resource Research Institute, and a group of local partners to study the use of charcoal from biomass as an alternative to fossil fuels. The project's goal is to create a sustainable supply chain that would reduce the company's Scope 1 CO_2 net impact by up to 30 percent and eventually scale to allow other recyclers to reduce their GHG impact. Future projects that the firm would be facilitating "will focus on advancing the fundamentals of critical metals recovery and waste valorization/minimization, including finding new product uses for slag and recovering acid from batteries."

Foto: GR-Archive

When the work is finished, "we expect that these technologies will be available to the commercial market and will play an important role in developing a low-carbon and diverse economy," Dr. Joseph Grogan, chief technology officer at Gopher Resource, was quoted.

gopherresource.com

GLOBAL SECOND-LIFE EV BATTERIES MARKET

Batteries with a second life are those whose lifespan has ended but can still be utilized in stationary systems in conjunction with renewable energy sources like wind and solar.

After six to eight years, lithium batteries used in EVs still have more than two-thirds of their usable energy storage, the American consulting company Custom Market Insights informed.

Old electric vehicle batteries could provide an additional five to eight years of service in a different application, depending on their condition. "Effective recycling or recovery of vital elements from spent batteries is a requirement for EV battery second life". According to a market research study published by Custom Market Insights, the demand analysis of the global second-life EV batteries market size & share revenue was valued at approximately 255 million US-Dollar in 2021. The outlook is positive. As underlined, the market is expected to reach around 92,000 million US-Dollar by 2030, at a CAGR (compound annual growth rate) of 45.2 percent between 2022 and 2030.

custommarketinsights.com/report/second-life-ev-batteries-market/

Canada:

CRITICAL MINERAL EXTRACTION PLANT UNDER CONSTRUCTION

Canadian company Lithion Recycling which now operates under the name Lithion Technologies has announced the construction of its first commercial critical mineral extraction plant in Canada. The commission of the facility is set for fall 2023.

According to Lithion, the plant will process over 15,000 tons of lithium-ion batteries annually, sourced from electric, hybrid, plug-in hybrid vehicles and non-conforming materials from cells and battery manufacturing to produce the company's critical minerals concentrate. "The plant is strategically located just outside Montreal to enable easy procurement of batteries and non-conforming materials from Canada and the United States while benefiting from its proximity to Quebec's growing battery industry," Lithion gave account. "The construction was made possible by the financial support of the Quebec Government, via Investissement Québec and the Fonds d'électrification et de changements climatiques, IMM Investment Global, Fondaction, and General Motors." As underlined, the new plant in St-Bruno-de-Montarville will be followed by the construction of a hydrometallurgy facility, which will separate the concentrate into its components to produce battery-grade lithium, cobalt, and nickel. "This second facility's commissioning is scheduled for 2026, following an upcoming financing round and site selection." Lithion has developed a process to recover strategic materials from end-of-life lithium-ion batteries and non-conforming materials from battery production. The applied technologies would allow for recovering up to 95 percent of battery components so that they could be reused by battery manufacturers to ensure circularity, the information said. "This innovation enables a sustainable energy transition and the achievement of society's decarbonization objectives by reducing the demand for natural resource extraction through the use of sustainable technologies and processes." Lithion's goal is the global deployment, through strategic partnerships and licensing, of 25 plants by 2035.

lithiontechnologies.com

MCDONALD'S PORTUGAL RECYCLES OLD CREW UNIFORMS INTO REUSABLE BAGS

Last year, the restaurant chain in Portugal debuted brand-new crew uniforms for more than 9,500 employees. But there was the question of what to do with the old uniforms – more than 18,000 – across the country.

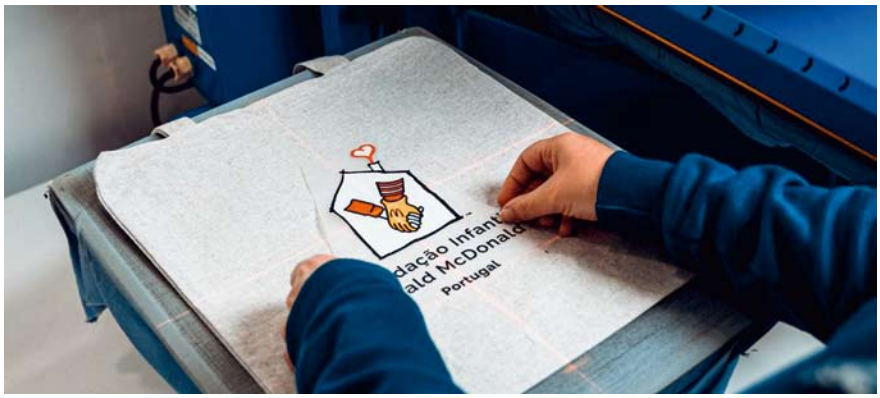


Photo: McDonald's Corporation

The company had the idea to give the garments a new life by transforming them into reusable tote bags. As reported, the recycling process involved several key players from across McDonald's Portugal's supply chain. Logistics partner HAVI collected more than 18,000 old uniforms from restaurants throughout the country while Recutex – Reclaimed Textiles transformed the clothing through various stages, including sorting the materials and spinning new fabric without introducing any dyes. Finally, HR Group – the partner responsible for producing the new uniforms – created reusable tote bags. 5,500 of these products were packed with comfort kits and delivered to families and their children staying at seven hospitals across Portugal. Continuing the momentum in 2023, McDonald's Portugal extended the recycling project – this time as a pilot merchandising campaign for MyMcDonald's Rewards.

HOW CIRCULAR IS SCANDANAVIA'S WASTE RECYCLING INDUSTRY?

Scandinavia – especially Norway, Sweden and Finland – made the headline in recycling. "Norway Leading the Way in Plastic Recycling", "The Swedish Recycling Revolution" or "Finland Aims to Bid Farewell to Rubbish Dumps" showed that something is going on in the north. But are these records in Nordic waste handling sustainable? Are the investments in recycling up to now so effective that they allow us to relax?

NORWAY

On target

In Norway, the course is set. A paper published by Norwegian Retailer's Environment Fund and others bears the title "Achieving Circularity" and says that the nation's industry needs to remove avoidable, single-use and hard-to-recycle plastic from the market, should join with governments to help finance improved waste collection and sorting and is asked to "invest in material and business model innovation". The national government could help "to ensure more economical recycling to attract private sector investment", whereas the industrial and financial sector "need to map out the waste system to identify recycling stream opportunities and invest in missing technologies locally".

Batteries: sustainable handling

The call was heard. Since 2021, when Norway became the first country in the world in which half of all new cars sold

Photo: Trygve / stock.adobe.com

were electric, it heavily invests in battery recycling. The aluminum producer Norsk Hydro joined the Swedish battery manufacturer Northvolt for a recycling joint venture called Hydro-Volt to operate the first battery recycling plant in Norway and received five million US-Dollar funding. Other companies like Norwegian metal producer Elkem, Vianode, Morrow Batteries, Freyr and Corvus Energy are said to be investing in sustainable battery production too; the research project "Sustainable Materials for the Battery Value Chain" was funded with about 9.8 million Euros by the Norwegian government's Green Platform initiative. According to the Investment-magazine "Business Norway", "it is obvious why Norway is becoming a world leader in battery recycling".

CO_2 neutral concrete

But Norway's industry is interested in managing several other materials. Høine, for example – an active contributor to the "Call for Re-use" in construction – is an Oslo-based company creating a market for recycled tiles in Norway by exclusively offering hand-sorted, CE-marked Danish quality tiles. Høine-CEO Jorunn Tyssø envisages a potential of recycled bricks totaling nearly half a million US-Dollar per year. But unfortunately, re-use in Norway has, so far, been hindered by a too strict interpretation of the regulations. Meanwhile, the government has simplified the rules for re-use and laid the foundations for a greener and more circular construction industry.

To create value from waste, the Norwegian startup Saferock aims to produce fully CO_2 neutral concrete by employing by-products. The geopolymer concrete is a type of inorganic polymers consisting of minerals, typically stemming from waste streams from mining industries and power plants. Saferock has raised 3.8 million US-Dollar to finance the first piloting factory. The new factory will use waste materials from the Titania factory in Sokndal. Saferock will receive 1.2 million US-Dollar in grants from Enova, a state enterprise owned by the Ministry of Climate and Environment and mainly financed by the proceeds from the "Fund for Climate, Renewable Energy and Energy Transition".

Fishing nets and paper: recycled

Snøhetta is based in Hemnesberget, Northern Norway. Together with furniture manufacturer Nordic Comfort Products (NCP), the company has developed a chair with a body made from 100 percent recycled plastic from the local fish farming industry in the North of Norway and a subframe made from recycled steel. The "Resurface Table" edited by Norwegian Trash AS is also made from marine waste from the Norwegian fishing industry; the project is receiving funding from the Norwegian Research Council to give a second life to plastic products in the form of furniture.

According to "Business Norway", the paper recycling plant run by Norsk Gjenvinning and technology company Bulk Handling Systems can recycle paper at 99.5 percent material purity that can compete with virgin raw materials. The NG Group manages 2.5 million tons of waste per year, at a recycling and recovery rate of 98 percent, of which 60 percent is recovered as new raw materials. The system was laid out to process 20 tons per hour, and three shifts to process approximately 120,000 tons annually.

Investing in harbor and ship recycling

Not to be forgotten amongst the circular oriented companies is Scanship AS, that was awarded a total of about 1.8 million for the building of a new plant to further commercialize its patented pyrolysis technology for chemical recycling of plastic waste. Worth mentioning is also Norway's first AI-powered robotic sorting station supplied by ZenRobotics featuring robotic arms that will perform up to 6,000 picks per hour to sort several fractions from industrial waste with a total capacity of 150,000 tons per year. By the way: Norway's deposit return scheme is the world's recycling role model and one of the most efficient, says recycling technique producer Tomra. Last but not least: Circular Norway, together with the consultancy company Vill Energi, not only assisted Narvik harbor with circular investment in developing a circular ecosystem and action plans for circular projects until 2040. Moreover, Norway has also expressed interest in investing in Bangladesh's ship recycling business, which has already set a February 2023 target to modernize and green all of the country's shipbreaking facilities, Invest Bangladesh signaled in 2020.

Circularity starting up

The Circularity Startup Index run by the Ellen Mac Arthur Foundation shows, amongst others, Packoorang presenting reusable packaging for different industries made of recy-

Promoting knowledge input, CIRCit – the Circular Economy Integration in the Nordic Industry for enhanced sustainability and competitiveness – wants to develop and deliver science-based tools and approaches.

cled polyester. Grin wants to develop smart, cost-effective, and safe return and collection systems. And Empower uses digitization, cloud-data and block chain technology to store and facilitate seamless information sharing about plastic waste and map waste flows.

Developing a circular economy

In this spirit, the Norwegian Center for Circular Economy – a development center for industry, business and public enterprises, which sees business opportunities in the circular economy and the green shift – is willing to "contribute to increased value creation and growth for companies, long-term competitiveness and the achievement of important climate and environmental goals". It wants to help develop new, circular business models for new value chains and markets for waste and side streams and new technology for increased circular economy and material recycling. Likewise, the Norwegian government declares in its "strategy for developing a green, circular economy" the purpose "to support the Norwegian industrial sector in making use of opportunities to enhance its green competitiveness in a circular economy". To use legislation and targeted initiatives to enhance circularity in building construction and operation. And "to make use of local and regional resources and industry structures throughout the country in developing a circular economy".

SWEDEN

Reputation in decarbonization

The latest Circularity Report gives Sweden the best marks: "Sweden's reputation as a global leader in decarbonization is well known: it's the first country in the world to introduce carbon pricing, and currently boasts the highest carbon price – both factors that have contributed to its relatively low-emissions society." And according to the journalistic platform Innovation Origins, Sweden plans to spend 13.8 billion Swedish Krona (1.3 billion Euro) on energy transition of which 270 million Euro are destined for the industrial sector, 500 million Euro for climate change, 375 million Euro for energy savings in the building sector and 140 million Euro investment in railroads.

Not only plastic recycling ...

Therefore, the Swedish industry is investing. Last year, Swedish Plastic Recycling (Svensk Plaståtervinning), for instance, started investing one billion Swedish Krona (96 million US-Dollar) in building "the world's largest and most modern facility for plastic recycling" called Site Zero. The Swedish Environmental Protection Agency (Naturvårdsverket) contributed funding of just over 180 million Swedish Krona (17 million US-Dollar) via its climate investment aid program known as Klimatklivet. Until its estimated completion in 2025, the facility will have a reception capacity of 200,000 tons of plastic packaging per year and is said to be climate neutral with zero emissions. In 2021, the European Investment Bank (EIB) signed a loan agreement of up to 311 million Swedish Krona (30 million US-Dollar) with textile producer Renewcell to "boost circularity in the fashion industry". Renewcell will produce Circulose, one or even the only commercially available textile-to-textile recycled material of virgin equivalent quality. For 2024, Renewcell and the Chinese viscose manufacturer Tangshan Sanyou announced a partnership for producing viscose fibers made from 100 percent recycled textiles in commercial quantities.

... but also efficient battery treatment

Stena Recycling and Stena Technoworld have created an efficient industrial facility for recycling more material from the industry, hundreds of cars and other waste from the society. The so-called Stena Nordic Recycling Center – together with Swedish car dismantlers – is sure to achieve the EU's requirement for 95 percent recycling rates for scrapped cars, "without having to send materials long distances for further processing". In 2022, Stena Recycling announced the establishment of seven new battery centers across Europe, where industrial batteries will be safely collected, discharged, and dismantled. More than that, the company even received a 70.7 million Swedish Krona (7.6 million US-Dollar) investment from the government power regulator Swedish Energy Agency to build a 10,000 tons-per-year lithium-ion battery recycling plant.

The aim: Recycle 95 percent of a lithium-ion battery used in electric vehicles and treat batteries from smart devices, power tools, domestic appliances and other electronic products. A project benefiting from the Swedish transition funds was called Hybrit (Hydrogen Breakthrough Ironmaking Technology). The consortium of the SSAB steel producer, the LKAB mining company and the state energy company Vattenfall has set themselves the goal of reducing iron ore by using fossil-free hydrogen and thus receiving sustainable steel by producing water as a residual.

Some ambitious policies

And then there is Nefco, in its own words "an international financial institution that finances the initial scale-up of Nordic green solutions on international markets", founded in 1990 by the five Nordic countries and taking "concrete actions to accelerate the green transition aligned". Nefco confirms that Sweden has "some of the most ambitious green-economy policies in the world" and certifies it as an "origin country of a great number of sustainable growth

companies and technologies". Nefco's portfolio in Sweden includes several other circular solutions. For example, the textile company Coloreel developed a technology for automated on-demand coloring of single recycled polyester threads. Scandinavian Enviro Systems recovers valuable resources from waste tires by patented pyrolysis processing. Elonroad designed a charging technology for electric cars. NOAQ Flood Protection delivers water-retarding barriers instead of sandbags. A company named Baseload generates electricity from waste as well as geothermal heat and expands its knowledge of energy production globally.

Private investment in decarbonizing

According to the Innovation Origins platform, Sweden is investing the corona millions primarily in projects such as manufacturing green steel and recycling batteries and accumulators. And there is some more private investment in decarbonizing the country. The Verdane Foundation, for example, provides donations, financial support and makes selective investments focusing on climate change, such as Bower and Katapult Ocean: Bower is a deposit solution for all packages or products running a "world-unique position-based scanning technology", while Katapult Ocean's portfolio companies are representing "the vanguard of impact ocean tech and the greatest opportunity for investment".

Blq Fund is an early-stage venture capital fund, investing in operating in tech and innovation and focusing on start-up companies and entrepreneurs in tech companies. Almi Invest, in its own words, provides venture capital for early-stage, emerging companies with high growth potential and a scalable business concept presented in the four main sectors technology, life science, industry and cleantech. And finally, Circular Sweden must be named: a corporate forum that aims to drive technological development, consumer behavior and policy forward in circular design, sustainable consumption, increased access to and utilization of recycled materials, and circular value chains. Among its members that have the opportunity to influence material flows or who are engaged in ambitious efforts to implement circularity are Coca-Cola Europacific Partners, Electrolux, H&M, Houdini, IKEA, NCC, White Arkitekter and the Recycling Industries.

In good condition

With the different funding and an official Swedish policy backing the deployment, Sweden's recycling management, seems to be in good condition. It sends less than one percent of its waste to landfills. And the nonprofit online magazine "Reasons to be Cheerful" balances "that between recycled solid waste and composted organic matter, Sweden recycles nearly half of what it throws away".

FINLAND

World's first national CE road map

Under the leadership of the Finnish Innovation Fund called Sitra, Finland, in 2016, prepared a national road map to a circular economy – the world's first one. A newer version updates Finland's plans to reform its economic model to ensure successful sustainability and aims at reaching four strategic cross-sectoral goals. It envisages the renewal of the foundations of competitiveness and an economic growth strategy. Moreover, it punts on transfer to low-carbon energy including its efficient use. Furthermore, it underlines that natural resources should be regarded as scarcities. And it relies on everyday decisions and choices as a driving force for change.

A golden opportunity

In October 2021, Finland received 2.1 billion Euro in grants from the European Commission to realize its recovery and resilience plan and to support the implementation of the intended crucial investment and reform measures. Some will be distributed by the Business Finland – a Finnish public-sector organization offering innovation funding and internationalization services. That – says the online-magazine "Baltic Industry" – will "accelerate the re-use and recycling of industrial by-products and waste streams (e.g. bio economy) as well as other key materials (e.g. plastics, textiles, packaging, electrical and electronic equipment, construction and demolition materials)". Sitra, the Finnish Innovation Fund, is sure that "rather than offering products, the foundation for earnings will be services, the recycling of products and intelligence-based digital solutions. Finland has a golden opportunity to become a pioneer and shift the focus of competitiveness to a carbon-neutral circular economy and low-emission solutions."

A pilot factory for leather waste

Recycling, at any rate, has found its way in a range of industrial branches. The textile sector delivers the best example. Finland-based Spinnova has developed breakthrough technology for making textile fiber of wood or waste, such as leather, textile or agricultural waste, without harmful chemicals. Together with KT Trading, the company was building a pilot factory in 2021 for fiber production out of leather waste, a material that can easily be repaired or is entirely biodegradable and recyclable.

The production process is said to create zero waste and side streams or microplastics as well as to avoid harmful chemicals, and its CO_2 emissions and water use are minimal. Meanwhile, Spinnova has received several awards, and

the German sportswear giant Adidas invested 3.6 million US-Dollar in the textile-recycling firm.

For a nationwide textile recycling

In 2022, the PCAW reported that Lounais-Suomen Jätehuolto (LSJH) received a "circular economy investment aid for building a full-scale end-of-life textile refinement plant". LSJH runs post-consumer textile collection and recycling points in Southwest Finland. Its new responsibility comprises sorting into different material types to be reused or mechanically processed into recycling fiber. And Espoo-based Infinited Fiber not only invested heavily in a commercial-scale factory for a recycling technology to produce a cotton-like premium quality textile fiber called Infinna. The enterprise also initiated the New Cotton Project – an EU consortium project together with partners like Adidas, Aalto University, Fashion for Good, Frankenhuis, H&M group, Inovfil, Kipas Textiles, REvolve Waste, Rise, Tekstina and Xamk. The aim: Collect, sort, regenerate and later re-collect textile waste into Infinited Fiber's cellulose-based textile fibers for different types of fabrics for clothing. The New Cotton Project has received 6.7 million Euro in funding from the European Union's Horizon 2020 program. According to the Professional Clothing Industry Association Worldwide, Finland could get "the first country in the world where post-consumer textiles are obtained nationwide for reuse and recycling".

Treatment of batteries and paper

Energy supplier Fortum sees its role in finding solutions for its customers' environmental and waste challenges to enable the circularity of materials. The company is engaged in the recycling of plastic, ash, metal and batteries: "Our low-CO_2 battery recycling solution makes it possible to recycle over 80 percent of the battery, and 95 percent of the valuable metals contained in the battery's black mass can be put back into circulation." In 2021, Fortum decided to invest 24 million Euro in a new state-of-the-art hydrometallurgical plant to start in the second quarter of 2023. With this expansion of the recycling capacity, the company "will help to ease the raw materials gap the European automotive industry is facing".

The three paper machines of the Sappi Kirkniemi Mill produce 750,000 tons per annum of high-quality coated mechanical paper tailored to high-quality publishing and advertising end uses and 300,000 tons per annum of bleached mechanical pulp for its consumption. In 2021, the company invested in reducing the mill's direct fossil greenhouse gas emissions by about 90 percent – equal to 230,000 tons of carbon dioxide annually. By the completion in early 2023 and following Sappi Europe's decarbonization roadmap, biomass will then be used as a fuel type instead of coal.

Engaged in glass

Concerning collecting and recycling packaging and flat glass and producing form glass from by-products, Uusioaines Oy is called the "leading player in Finland". It is characterized by "long-standing relationships with recyclable glass suppliers and a well-functioning processing plant with experienced professionals". This evaluation derives from Finland-based investment company Partnera Oy and state-owned Finnish Industry Investment Oy. Already in 2018, both companies transacted 19.8 million Euro to Uusioaines, while MCF Corporate Finance helped to "facilitate the deal with a proven track record in circular economy transaction".

Leading in steel- and aluminum-recycling

Kuusakoski calls itself "Northern Europe's leading recycling services company", based on competence with materials, recycling and environmental technology. It aims to "restore value to waste material by collecting, processing, and upgrading it into a new raw material". Lately, the company planned a 25 million Euro investment in a carbon-free steel recycling plant in Veitsiluoto to increase the company's annual recycling capacity of metal-containing waste by 150 thousand tons, or 25 percent.

In February 2023, Kuusakoski announced the building of a new composite plant for shredding and treating "composites safely and effectively" in Southern Finland with a total value of four million Euro. In the same month, the company published the plan to invest 25 million Euro in a new production line at the company's recycling plant in Heinola, so that – for example – "the production of recycled aluminum will, for the first time, exceed that of primary aluminum". And in October 2022, seven million Euro were provided for a facility to effectively process copper and aluminum-containing cables and wires and separate the metals. According to Kuusakoski, these and other measures are "part of

Photo: Presona

the multi-year investment program which aims to increase capacity, enhance material yield and deliver cleaner end products – recycled raw materials".

Start-ups in packaging material

The Circular Startup Index of the Ellen MacArthur Foundation on Finland contains Spinnova and comprises RePack with its reusable and returnable packaging services for e-commerce. Kamupak's mission is to reduce the world's waste load with a digital deposit system for reusable take-away packaging. Plafco Fibertech Oy provides processing technology to transfer paper to all cellulosic composite – with a material that is fully biodegradable, bio-based and can be recycled in existing paper loops.

SCANDINAVIA

One of its general faults: Incineration

In 2019, Eunomia, which called itself an independent consultancy for sustainability, published an "Analysis of Nordic regulatory framework and its effect on waste prevention and recycling in the region". The study offered data on treatment routes and recycling rates of the before-mentioned Scandinavian countries. So, it showed that Norway's total waste generation and recycling rate of waste remained relatively unchanged since 2008 between 50 and 55 percent, but stagnated in recent years and even decreased slightly between 2016 and 2017. Although being "a world leader in the development and application of recycling and sorting technologies", the country incinerated and used thermally about 100,000 tons i.e. 40 percent of its household waste. For Sweden, the study determined a recycling rate since 2006 in the high 40s, followed by a stagnating quota between 45 and 50 percent since 2008 and 48.9 percent in 2016. The landfilling volume was reduced from former 1.5 million tons to zero, but incineration needed permanently more than two million tons – roundabout half – of the household waste. The Swedish Waste Management Association in 2020 spoke of nearly 50 percent being turned into energy. Since 2000, Finland's dry recycling tonnage amounted to between 60.000 and 80.000 tons, while the incineration volume rose from about 10,000 to 150,000 tons – reaching nearly half of all household waste.

Norway: Harsh competition for incineration

"Norway leads the way in turning waste to energy", "The Guardian" wrote in 2014. And added that the land "is importing as much rubbish as it can get its hands on". Since the ban on landfills from 2009, the country invested in modern waste-to-energy incineration plants. The Klemetsrud incineration plant in Oslo turns waste into heat for 60,000 homes in about 340,000 households. In 2010, Sweden and Norway went "in harsh competition for the incineration of waste", WtERT Germany gave account. In 2015, Sweden began with "building a lot of waste incinerators, and they are now competing in the Norwegian market", the Deutsche Welle cited Jannicke Gerner Bjerkås from the Klemetsrud plant. Consequently, hundreds of large trucks carried Norwegian waste to Sweden. Following data from Statistics Norway, the national waste incineration sank from 1,683,000 tons in 2017 to 1,470,000 tons in 2021. In 2021, Fortum, running the Klemetsrud plant, published plans to make it the world's first waste-to-energy plant with full-scale CCS-technology.

Sweden: Overcapacity for incineration

Concerning Sweden, Hanna Salmenperä not only found out that between 2018 and 2023 the Swedish import of waste for incineration "increased substantially", but also stated that the country "currently has overcapacity for incineration". Another source underlines that nearly half of the country's non-recycled waste is burned and transferred to power or heat. The Zero Waste Europe organization criticizes that the "increased focus on incineration over the years has brought about stagnation in recycling rates since 2006" and the recycling average of 33 percent of total municipal solid waste is still a way away from the European Commission's common EU MSW recycling target of 65 percent by 2030.

Finland: Mixed waste exported

In an investigation of "different pathways to a recycling society", conducted by Hanna Salmenperä from the Finnish Environment Institute, the author determined that there is still some need for more incineration capacity, as mixed waste is exported for energy recovery to neighboring countries. According to Eunomia, there were nine waste incineration plants in operation in 2015, burning municipal waste and waste from other sources. Additionally, Finland runs 25 plants licensed for co-incineration for separated wastes from industry, commerce and municipalities. And 73 power plants used industrial by-products and wastes from in-company circulation in addition to conventional fuels, not to forget one high-temperature incineration plant for hazardous waste.

Recycling must be increased

It was only consequent that Eunomia published an article postulating "Nordic region must increase recycling". The proposals in detail included: more attractive economics of recycling, dramatic increase in recycling collection coverage from households and businesses, leverage of additional

taxation measures and significant shift away from incineration towards recycling. The consultancy, with a view on the new EU target of 65 percent by 2035, pleaded for an increase in recycling between 16 to 32 percent.

Broad support to a shift

No doubt that Scandinavia is highly interested in a transition to a circular economy; science, technology and stakeholder offer support. The Nordic Working Group for Circular Economy (NCE) – a merger of the Nordic Waste Group (NAG) and the Working Group for Sustainable Consumption and Production (HKP) – was set up in 2019. The group's priorities want to improve work on product design and communicate products' environmental characteristics in the market. The Nordic Circular Economy Playbook wants to enable circular business advantage and circular business models to reach "new levels of efficiency through technology and digitalization".

Promoting knowledge input, CIRCit – the Circular Economy Integration in the Nordic Industry for enhanced sustainability and competitiveness – wants to develop and deliver science-based tools and approaches. The scientific research project defines itself as "a promising approach towards maximizing value by increasing resource productivity, enhancing energy efficiency, lowering resource consumption and decreasing waste" to establish the Nordic Industry "as a benchmark in the field". Another program for "Nordic Green Growth Research and Innovation" saw the funding of 6.2 million Euro through NordForsk, Nordic Innovation and Nordic Energy Research. The Nordic Sustainable Construction program's purpose is to establish the Nordic Region as a leader in sustainable and competitive construction and facilitate the green transition in the Nordic construction industry.

Photo: Kristina Černá / pixabay.com

Circularity gaps of more than 96 percent

It will take much more effort to make the Nordic economy circular. At least for Norway and Sweden, Circularity Gap Reports have been published that prove a national circularity rate of 2.4 percent for the first and 3.4 percent for the second country. Both are below the global average of 8.6 percent leaving circularity gaps of more than 97 and 96 percent.

"Norway consumes 235 million tons of materials – metals, fossil fuels, biomass and minerals – to fuel its societal needs each year. 97.6 percent of these materials are never cycled back into the economy", the report released in 2022 recapitulates. The private sector – subsidized by the national government – can contribute to a better economic recycling. The "Achieving Circularity" paper explains, that this could be realized through benefit schemes for recycling plants. Through financial incentives for the use of recycled content. Through disincentives for the use of virgin material. Or through disincentives for the inset of plastic into waste-to-energy-incineration.

The other report substantiated the circularity rate with the fact that the vast majority of resources Sweden uses to satisfy its needs and wants come from virgin sources. The paper comprises of elements including 40 percent stocked material like buildings and infrastructure and around 36 percent of materials like biomass with the potential for end-of-life recycling. Non-circular flows such as fossil fuels and non-renewable inputs represent approximately 20 percent of the gap.

Enough work

So, there is enough work to make Sweden's economy circular or – to say it with the words of the national strategy – in "becoming the world's first fossil-free nation in the world". That – says the Circularity Report on Sweden – could be reached by shifting to a circular housing and infrastructure sector (material consumption reduced by 8.2 percent), by cultivating a more wholesome food system (material consumption reduced by 7.3 percent), by backing material efficiency and new business models in the manufacturing sector (material consumption reduced by 5.3 percent), by reshaping the extractive industries like mining, quarrying, biomass extraction and fishing (material consumption reduced by 3.4 percent), by driving clean mobility forward (material consumption reduced by 3.5 percent) and by designing conscious consumables (material consumption reduced by 4.5 percent).

ALUMINUM CASTING MARKET TO HIT 171 BILLION US-DOLLAR BY 2033

Market research company Fact.MR offers a new report on the "Aluminum Casting Market", which is expected to grow from its current value of 93.5 billion US-Dollar in 2023 to 171 billion US-Dollar by the end of 2033. According to Fact.MR, the demand for aluminum castings would grow at a robust CAGR of 6.2 percent over the following ten years.

"The automotive industry is embracing the use of large aluminum castings or mega castings in vehicle structures," Fact.MR gave account. "This shift is driven by a desire to reduce production costs and vehicle weight while providing the same level of performance and safety. That could significantly benefit the automotive market in the years to come as lighter and more affordable vehicles become available."

Aluminum is known for its lightweight nature and high strength-to-weight ratio. It is widely used in various industries, such as automotive, aerospace, and consumer goods, where lightweight materials are essential for fuel efficiency, improved performance, and enhanced productivity. Continuous advancements in casting technologies, such as computer-aided design (CAD), simulation software, and automated processes, have significantly improved the efficiency and quality of aluminum castings, the provider of the report wrote. "These advancements enable complex designs, precise tolerances, and reduced lead times, making aluminum castings more attractive to industries that demand high-performance components." Furthermore, aluminum is a highly recyclable material with a low melting point, making it energy-efficient to recycle compared to primary production. The focus on sustainable practices and environmental regulations would drive the demand for aluminum castings as they offer a recyclable and eco-friendly alternative to other materials.

factmr.com/connectus/sample?flag=RC&rep_id=2462

BIR World Recycling Convention & Exhibition in Amsterdam:

CRITICAL RAW MATERIALS – SECURITY OF SUPPLY IS A "HOT TOPIC"

At the meeting of the BIR International Environment Council, IEC Chairman Olivier François of the Galloo recycling company stated that a "huge quantity of metals" – including many designated as "critical" – would be required to meet energy transition objectives; as a result, security of supply had become a hot topic. Two guest speakers focused on this issue.

USA: Actions to be taken

According to Robin Wiener, President of the Institute of Scrap Recycling Industries (ISRI), the USA imports more than 50 percent of its consumption of 43 of the 50 critical minerals identified on a United States Geological Survey list. Aluminum, nickel and zinc are already featured on this list, and copper producers have petitioned for the inclusion of copper. Furthermore, the USA has no domestic production for at least 14 of the listed minerals.

The three main pillars of the US critical minerals strategy were to diversify domestic sources, to develop alternatives and to minimize waste and increase supply through more efficient processing, manufacturing and recycling. These objectives would be backed by investment in R&D and by incentives for private industry to move the strategy forward, delegates in Amsterdam were told. The significant financial commitment would include three billion US-Dollar in refining battery materials (lithium, cobalt, nickel and graphite) as well as battery recycling facilities and innovation.

Robin Wiener emphasized that the strategy was clearly not US-centric as it also promoted increasing trade and co-operation with allies and partners (named "friend shoring") to reduce the USA's dependence on sources that could be disrupted. For example, there are traditional Free Trade Agreements with 20 countries, including Canada and Mexico, and a limited agreement on these materials with Japan.

In addition, critical mineral agreement negotiations with the EU were ongoing. The focus on critical minerals represented "a transformational point for our global industry", Robin Wiener underlined. "We need to be a part of this discussion and not get left behind. We should develop a strategy of how we work together."

EU: Proposal on critical raw materials

Emmanuel Katrakis, Secretary General of the European Recycling Industries' Confederation (EuRIC) informed the IEC meeting that the European Commission has proposed a set of actions under the Critical Raw Materials Act to safeguard the EU's access to a secure, affordable and sustainable supply. By 2030, the EU intents to be "not dependent on a single third country for more than 65 percent of its supply of any strategic raw material".

Another target identified by the Commission is for recycling capacity to be sufficient to produce "at least 15 percent" of the EU's annual consumption of each strategic raw material. As pointed out by Emmanuel Katrakis, "for most of them we are far, far, far from that." Now that policymakers had recognized recyclers as "key players", it was necessary to build an understanding that many critical raw materials were not being recycled at present because companies would be risking bankruptcy. As had been introduced in the USA, he added, "we need a financial pillar that is missing today".

Informed about the situation regarding critical raw materials: Robin Wiener, Olivier François and Emmanuel Katrakis

Photo: BIR

CIRCULAR ECONOMY IN THE CONSTRUCTION SECTOR

In April this year, following a four-year break, BAU, one of the world's leading trade fairs for architecture, materials and systems, was back.

About 190,000 visitors informed themselves at the Messe München exhibition center about the innovations and trends of the 2,260 exhibitors (2019: 2,250) from 49 countries (2019: 45 countries). Halfway through the trade fair, visitor numbers almost reached the 2019 level. However, token strikes at German airports and in the regional and long-distance public transport system curbed the positive trend. According to the organizers, BAU, nevertheless, delivered a very successful result despite these general conditions.

One area of focus at the exhibition was the latest developments for sustainable and recyclable building materials. The topics of circular economy and urban mining were also on the agenda in the presentation program. The goal of the circular economy is to plan and build in a way that results in as little waste as possible, whereby materials are reused rather than disposed of, Messe München underlined.

At BAU 2023, exhibitors offered reusable products under the label "Re-Used" and the return of used products. These will then be prepared, declared as used and re-sold. Trading organizations, where regional and local builders' merchants come together to procure products in large quantities and on favorable terms, are also saving resources. Here, purchasing is based on actual demand and specifically considers local manufacturers.

Proof, certifications, databases

There is also increasing demand for proof of the sustainability of products and building materials as part of the bidding process. However, manufacturers often find this difficult in the thicket of standards and regulations, the exhibition corporation stated. "The basis is provided by Environmental Product Declarations (EPDs), which are issued by the Institut Bauen und Umwelt (IBU), for example. They contain information about the environmental impact of building materials, construction products and building components. Product or material databases that list recyclable products are relatively new. There, manufacturers can upload their products and, if necessary, have them evaluated immediately. The product information, in turn, flows into the sustainability assessments of entire buildings, which various organizations (DGNB, BNB, BREEAM and LEED) carry out and award certifications for."

Urban mining: Great potential for secondary raw materials

The term "urban mining" refers to removing materials that have already been built in urban areas to be reused. There is great potential for secondary raw materials. "According to the German Environment Agency, an old building with ten residential units will deliver an average of 1,500 tons of material for reuse," the organizers of the trade fair underlined. "Figures published in 2010 indicate that the material in existing buildings and infrastructure adds up to 28 billion tons. In future, there will be material passports to document what is installed and where."

Recycling primarily for road construction and earthworks

"It is true that more than 90 percent of the building materials that result from the processing of mineral construction and demolition waste are recycled; however, only 20 percent of that goes to asphalt and concrete production," Messe München reported. The majority would end up as recyclate in road construction and earthworks, "not in building construction, which requires high-quality raw materials". An additional problem would be that the recycling potential of traditional building materials such as concrete, metal, glass, brick, plastic or plaster has not yet been adequately researched for many application areas. "One of the many issues is correctly separating materials and construction prod-

Photo: Messe München

ucts that are often glued or screwed together. This is an indispensable prerequisite for returning materials to technical or biological cycles and must therefore be taken into account during the planning phase."

Up until now, wood is the only material to have established itself as a renewable raw material. One in four detached and duplex houses in Germany is constructed from wood. That is not the case with flax, bamboo, clay, hemp or straw: Although these materials are considered to be the building materials of the future, they are not yet ready to play a major role in architecture or replace conventional building materials, the exhibition corporation described the current situation. "When it comes to tensile and compressive strength, concrete and steel will continue to dominate, at least in the near future."

■ The next edition of BAU will be held from January 13 to 17, 2025, at the Munich exhibition grounds.

bau-muenchen.com/en/

Construction and Demolition Waste:
EURIC LAUNCHED NEW BRANCH

The European Recycling Industries' Confederation (EuRIC) has officially launched its construction and demolition branch. Aiming to represent European recyclers' interests, the new division would evaluate and contribute to implementating the EU's Green Deal and Industrial Strategy by promoting a circular economy approach, the umbrella organization for the recycling industries in Europe announced in May.

Accounting for ten percent of the total value added in the EU economy, the construction sector would drive economic growth, employing around 25 million people and representing some five million companies, mostly SMEs (small and medium-sized enterprises), EuRIC underlined. "However, it is also one of the most resource-intensive sectors, generating 30 percent of the EU's annual waste and 9.4 percent of its total carbon footprint, according to the European Commission. For European recyclers, it is a key sector for achieving the EU's climate neutrality objective, and it requires a more sustainable use of construction materials, which cannot be achieved without increased recycling." EuRIC's construction and demolition branch "is launched at a time where construction and demolition waste as a stream is under intense scrutiny by policymakers at EU and Member State level", Emmanuel Katrakis, secretary general of the organization, was quoted. Therefore, the branch would advocate for the full application of circular economy principles in the construction sector by incentivizing the use of circular construction materials and leveling the playing field with extracted raw materials. "In addition, advocacy will be focusing on the setting up of a proper EU regulatory framework that boosts the use of C&D waste in the construction sector and beyond, green procurement, standardization that supports the use of circular materials and products, comprehensive end-of-waste criteria or mandatory recycled content in construction products."

Photo: O. Kürth

Huge volumes

In the European Union alone, about 450 to 500 million tons of construction and demolition waste (CDW) are generated annually. According to the European Commission, this quantity accounts for more than a third (35 percent) of all waste generated in the EU and contains a wide variety of materials such as concrete, bricks, wood, glass, metals and plastic, including hazardous materials like asbestos.

As reported by Statista, the recovery rate of CDW in the European Union (EU-27) was 88 percent in 2018. "EU countries were set a recovery target of 70 percent by 2020 under the 2008 Waste Framework Directive, which was defined as including all recycling and other recovery operations such as backfilling. Although most countries have already achieved this target, backfilling or on low-grade recovery accounts for a large share of several EU Member States recovery rates."

euric.org
environment.ec.europa.eu/topics/waste-and-recycling/construction-and-demolition-waste_en

ELECTRIC ARC FURNACES MARKET TO GROW

According to Transparency Market Research Inc., the "Global Electric Arc Furnaces Market", which stood at 800.0 million US-Dollar in 2022, is projected to reach 1.3 billion US-Dollar by 2031. The global industry is anticipated to expand at a CAGR (compound annual growth rate) of 5.7 percent between 2023 and 2031.

As stated by the USA-headquartered research company, the market value of electric arc furnaces is increasing due to the growing demand for steel, driven by factors such as infrastructure development, urbanization, and industrialization. Electric arc furnaces play a crucial role in steel production by melting scrap metal and transforming it into steel.

"The advantages of electric arc furnaces are another significant factor contributing to the market growth," Transparency Market Research underlined. Compared to oxygen-based converters, the benefits of these furnaces would include flexibility in raw material selection, lower energy consumption, reduced greenhouse gas emissions, and the ability to produce specialty steels. "These factors make electric arc furnaces an attractive choice for steel manufacturers, contributing to market growth." The market prospects had been driven by environmental regulations and sustainability. Electric arc furnaces are considered more environmentally friendly compared to conventional steelmaking methods. They emit fewer pollutants and greenhouse gases, leading to reducing environmental footprint.

Photo: Peter H / pixabay.com

The focus on sustainability and compliance with environmental regulations is expected to drive the adoption of electric arc furnaces, thereby boosting market growth.

transparencymarketresearch.com/sample/sample.php?flag=S&rep_id=74183

Wealth in Waste:

INDIA'S POTENTIAL TO LEAD CIRCULAR TEXTILE SOURCING

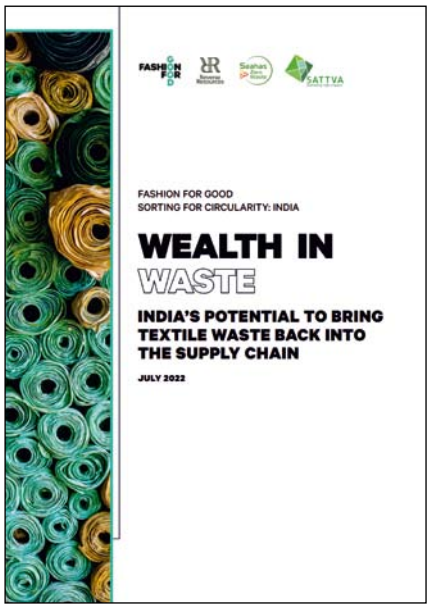
According to the Dutch organization Fashion for Good, the study "Wealth in Waste: India's Potential to Bring Textile Waste Back into the Supply Chain" – released in July last year – is the most comprehensive analysis of the Indian textile waste landscape.

"India is in a unique position to leverage existing infrastructure and resources to emerge as a leader in capturing waste, implementing new sorting and recycling technologies, and reintroducing its textile waste back into the global market, securing its role as the leading circular sourcing region," the press release said. Commissioned by Fashion for Good as part of the "Sorting for Circularity; India Project", the study was conducted in collaboration with Sattva Consulting, Saahas Zero Waste and Reverse Resources, "specialist organizations in strategic impact, waste, resource and data management, and the scaling of textile recycling infrastructures".

The report would attempt to fill the data gaps in the textile waste landscape in India to enable an effective transition towards circularity, the Netherlands-based organization informed. "By building a better understanding across three key streams, domestic post-consumer waste, pre-consumer waste, and imported waste, and by mapping stakeholders, geographical flows and recognizing challenges in the current infrastructure, the study aims to help ecosystem players to orchestrate actions and devise solutions and mediate accordingly."

Opportunity for Indian players

Up to 7,800 kilotons of textile waste is accumulated in India annually. An estimated share of 51 percent originates from Indian consumers: post-consumer waste, with factory waste and offcuts. The volume of pre-consumer waste amounts to 42 percent, followed by imported waste that contributes a further seven percent. India's textile waste accounts for 8.5 percent of the global total, the information said.



"Only 59 percent of the textile waste in India finds its way back into the textile industry through reuse and recycling, with a mere fraction making it back into the global supply chain."

As reported by Fashion for Good, a lack of strict regulation, informal, and in some cases non-existent traceability systems, excessive cost competitiveness and limited technological infrastructure to process certain types of waste has limited the potential of circular value chains so far. "Detailing the bottlenecks in the current processing of waste, the study identifies materials that can be ranked according to their best potential through a waste value hierarchy framework as well as actions that can push the materials up the hierarchy in the future." Outlining the potential for collaborative and systemic interventions to fortify circularity in the Indian textile waste industry and reintroduce it into the supply chain, the study would present a three-step approach to driving this transition: enabling visibility and ac-

Good Fashion Fund

The Good Fashion Fund (GFF) is an investment fund focused solely on driving the implementation of innovative solutions in the fashion industry. "Currently, apparel supply chains are plagued by negative environmental and social impacts. While sustainable solutions exist today, there is a lack of capital available to scale these technologies within the supply chain," one can read on the homepage of Fashion for Good. "The Fund was created to address this gap – connecting the most promising technologies to the industry, to collaboratively tackle its challenges." The Good Fashion Fund would invest in the adoption of high impact and disruptive technologies and circular innovations in the textile & apparel production industry in Asia (India, Bangladesh, Vietnam).

goodfashionfund.com

Source: Fashion for Good

cess to waste, harnessing the recycling potential of India, and establishing systems, infrastructure and regulations for waste management.

"Wealth in Waste: India's Potential to Bring Textile Waste Back into the Supply Chain" was presented and launched in New Delhi in July 2022, during an industry-focused event in collaboration with Apparel Export Promotion Council (AEPC), Fashion for Good gave account. The event brought together key players and changemakers from across the value chain to present the study, and featured a panel discussion with industry leaders from Birla Cellulose, PVH Corp. and AEPC to discuss the findings and actions for the industry to implement.

The study "Sorting for Circularity; India Project"

The "Sorting for Circularity; India Project" is initiated by Fashion for Good and was launched in November 2021. The project is supported by project partners: Laudes Foundation as a catalytic funder, PVH Corp., Adidas, Levi Strauss & Co, TESCO, Primark, Arvind Limited, Birla Cellulose and Welspun India, and technology partner Reverse Resources.

As underlined, "Sorting for Circularity" is a framework conceived by the Dutch organization, with the aim to (re)capture textile waste, expedite the implementation of game-changing technologies, and drive circularity within the fashion value chain. Insights from the Fashion for Good and Aii (apparel impact institute) collaborative report "Unlocking the Trillion Dollar Fashion Decarbonization Opportunity", which charts a trajectory for the industry to meet its net-zero ambition by 2050, would highlight the potential and significant impact on carbon emissions in the industry through material efficiency, extended and re-use of waste. "Building on these insights, Fashion for Good's scope of work encompasses several, industry-wide, pre-competitive projects such as the Full Circle Textiles Projects – focusing on the recycling of man-made cellulosic fibers and polyester, amongst others, which tie into the net-zero ambition, and the greater goal of this project to close the loop on textile waste and reducing the industry's environmental impact."

reports.fashionforgood.com/report/sorting-for-circularity-india-wealth-in-waste/
fashionforgood.com

About Fashion for Good

With C&A Foundation as a founding partner, and building on its co-founder William McDonough's philosophy of Cradle-to-Cradle, Fashion for Good was established as a global, collaborative innovation platform to tackle the problems faced by the fashion industry.

The platform works directly alongside the most promising Innovators, bringing them together with market players – i.e. brands, retailers and manufacturers – in order to make it easier for them to work together effectively, bridge the innovation gap and bring these innovations to the mainstream.

NEW TEXTILE RECYCLING AND AIRLAY LINE IN GUATEMALA

International technology group Andritz has delivered, installed, and commissioned a mechanical textile recycling line and an airlay line at Novafiber's nonwovens production mill in Palín, Guatemala. Since December last year, both lines have been successfully operating at one of the leading companies in Guatemala for producing nonwovens from post-industrial textile waste for both the local market and export.

As reported by Andritz, the recycling line – the second tearing line the manufacturer supplied to Novafiber – processes post-industrial textile waste from Central America. The recycled fibers would feed the Flexiloft airlay line, which produces nonwoven products for the bedding and furniture industries. "The production process ensures complete material use as a state-of-the-art edge trim recycling system returns any waste directly to the tearing and/or airlay line," Andritz emphasized. This combination of tearing and airlay lines would allow Novafiber to process large amounts of post-industrial garments, controlling the supply chain from raw material to the final product.

Novafiber CEO and Head of Production together with Andritz technicians and project manager in front of the newly installed 6-cylinder EXEL line

Photo: Andritz

andritz.com

Australia:

TASKFORCE INTENDS TO RESTORE SOFT PLASTICS RECYCLING

After the collapse of the country-wide recycling scheme for soft plastic waste from any source suspended in November 2022, a task force is working on a solution.

The Soft Plastics Taskforce, made up of major Australian supermarket retailers Aldi, Coles and Woolworths, has released a roadmap to restart, outlining the steps needed to launch a new supermarket collection scheme. Accoring to the three supermarket retailers in March, the work group has to develop an interim solution to restore community access to soft plastic recycling. Under the current plan, an initial in-store collection pilot was anticipated to launch in select stores in late 2023, provided that the existing soft plastic stockpiles of the previous program could be cleared beforehand. The new program would then be gradually rolled out nationwide next year.

However, there are still obstacles to overcome. “At present, it would not be possible to recycle the volume of household soft plastics collected in a supermarket program using domestic infrastructure,” the information said. “Accordingly, the task force has plotted out the projected gradual increase in Australian soft plastic recycling capacity over the next year, as new operators launch and existing processors expand.” From late 2023, the operational team would “meet the newly available processing capacity with a staged re-introduction of in-store collections so that the volume of incoming household soft plastics does not exceed the amount that can be recycled”.

Restoring public trust in soft plastic recycling is paramount, the information said. The task force would reintroduce soft plastic collection when it can be confident that it will be properly recycled. “We owe it to consumers to get this right. The best way to accelerate nationwide access to soft plastic recycling is through continued investment in recycling facilities to bring forward existing plans to expand domestic capacity.”

Should new domestic processing capacity be taken up by the estimated 12,000 tons of stockpiled material for at least a year, the recommencement

The situation

The REDcycle program was suspended in November 2022 after it became known that the company, founded in 2011 as an independent commercial business, had been stockpiling collected soft plastics for an unknown period due to insufficient processing capacity. The collection had included household soft plastic waste from any source (not only supermarkets), grocery packaging, e-commerce parcels and items from a wide range of retailers and FMCG (Fast Moving Consumer Goods) brands deposited for recycling. More than 270 consumer brands in Australia had paid the firm to collect the soft plastics deposited for recycling.

Coles made an application to the Australian Competition and Consumer Commission (ACCC) for urgent authorization on behalf of Coles, Woolworths and Aldi to enable a joint roundtable of supermarkets to collaborate on interim solutions to the suspension of REDcycle’s soft plastic recycling services. The first meeting of the Soft Plastics Taskforce was in early December last year, following an interim authorization from the ACCC the week prior. The Federal Department of Climate Change, Energy, the Environment and Water chair meetings.

Regarding the not recycled plastic volumes, Coles and Woolworths have made an offer to REDcycle to take control of its stockpiled soft plastic and provide safe storage of the material while recycling solutions are explored, which was accepted.

Foto: Landratsamt Kitzingen studio zudem / abfallbild.de

of in-store collections would be delayed. “Accordingly, Coles and Woolworths intend to work through options to export the stockpiles to trusted recycling facilities overseas with the necessary transparency, traceability and government approvals. This would allow access to advanced recycling beyond Australia’s existing domestic capabilities.” The task force hopes to engage other retailers, e-commerce platforms and consumer brands that generate soft plastics to contribute to developing the new in-store collection program.

Collection trial

As per the information, the National Plastics Recycling Scheme (NPRS) outlines a new curbside model to collect more household soft plastics. The Australian Food and Grocery Council have developed it with funding support from the Australian Federal Government’s National Product Stewardship Investment Fund. The scheme is based on a model, which would see food and grocery manufacturers pay a levy to support recycling the soft plastics they create. It is currently being trialed in select areas. “The Victorian Government has announced a future statewide rollout of curbside soft plastic recycling, pending the success of the current NPRS trial.”

WATER AND WASTEWATER TECHNOLOGY EXPORTS FROM GERMANY

As the elixir of life par excellence, the importance of water in our daily lives is undeniable. Therefore, clean water for everyone is one of the United Nations’ 17 sustainability goals. However, to achieve this goal state-of-the-art technology is indispensable. Thus, it is hardly surprising that the mechanical and plant engineering sector reports that innovative and efficient water and wastewater technology was in greater demand worldwide than ever before in 2022.

Although manufacturers of components and systems for water treatment, wastewater, and sludge treatment in Germany were also confronted with considerable political and economic uncertainties, the previous record level of exports in 2021 was once again exceeded. Compared with 2021, exports in 2022 rose by just under one percent to around 1.2 billion euros.

EU-27: Even more important

48 percent of all exports of water and wastewater technology from Germany were exported to the other EU states. In 2022, the share of these exports increased by four percent to an export volume of 571 million euros. The position of the EU-27 as the most important customer region for domestic manufacturers thus increased once again last year.

For the equally important customer regions of Other Europe (down 3.6 percent), East Asia (down 9.8 percent) and North America (up 7.3 percent), exports each changed in the single-digit percentage range.

For the smaller customer regions, the rates of change were in double digits. The most significant positive changes were in Latin America (up 34.7 percent) and Central and South Asia (up 26.3 percent). The sharpest declines were recorded in North Africa (down 38.1 percent) and Southeast Asia (down 23.1 percent).

Photo: bernhard kuehnholzer / pixabay.com

Four of the ten most important export markets up

Of the ten most important individual markets for water and wastewater technology from Germany, four markets developed positively and six (in some cases only very slightly) negatively in 2022. Unchanged, France led the ranking of the three most important export markets with 87 million euros (minus 2.9 percent), followed by the USA (84.5 million Euro; up 6.9 percent) and Poland (73.9 million Euro; down 6.4 percent). China, still the most important market in 2020, lost further importance as a market last year (minus 19.3 percent) and ranked only 6th among the most important sales markets behind the Netherlands and the United Kingdom. The highest percentage growth in exports from Germany was recorded by the Netherlands with a plus of 47.8 percent.

As in previous years, German suppliers of water and wastewater technology succeeded in offsetting significant declines in exports to individual regions or markets (China, for example) with equally significant increases in other regions or markets.

vdma.org

Singapore:

PILOT RECYCLING PLANT TO TACKLE BATTERY WASTE WITH FRUIT PEELS

Following a successful proof-of-concept to recycle spent lithium-ion batteries using reagent extracted from fruit peel waste, Nanyang Technological University, Singapore (NTU Singapore) is collaborating with Singaporean company Se-cure Waste Management Pte Ltd (SWM) to scale up the technology in a pilot plant.

According to the university, the pilot battery recycling plant has the capacity to process up to 2,000 liters of spent shredded battery mixed with fruit peel derived solvents for extraction of electrode materials such as cobalt, lithium, nickel, and manganese. "The scientists from the NTU Singapore-CEA Alliance for Research in Circular Economy (SCARCE), who developed the technology of using fruit peel waste to tackle battery waste, is also looking at using other types of biomass waste."

As reported, a key feature of the pilot plant is its modular design. Apparently, it allows it to be easily configured for optimal reaction conditions to extract different types of metal. Located at Neythal Road off Pioneer Road North in Singapore, the pilot plant has been operational since the last quarter of 2022. "Over the course of this year, the NTU and SWM team will work to optimize processes that maximize the extraction yield of valuable metals from battery waste for reuse at pre-commercial scale", NTU gave account. They would also evaluate the plant's technical performance and economic viability with the goal of commercializing the technology.

Using biomass waste to replace strong chemicals

In 2020, an NTU team led by Associate Professor Dalton Tay and Professor Madhavi Srinivasan successfully extracted over 90 percent (in weight) of the precious metals found in processed lithium-ion battery waste in the lab using orange peel waste and made new batteries with these recovered metals.

"This method of using fruit peel waste in place of conventional strong chemicals and acids to extract precious metals from battery waste is called hydro-organic-metallurgy", the Singaporean university informed. "The scientists have since successfully replicated their success in the lab using other types of fruit peel waste – such as the peel of pineapples, pears, and lemons – before working with local e-waste recycling company Se-cure Waste Management (SWM) to scale up this technology." In this new pilot plant the process starts with SWM shredding and crushing spent lithium-ion batteries to form a crushed material, from which plastics and metals like copper, aluminum, and iron are separated. On average, the company processes 18 tons of spent lithium-ion batteries daily.

The final product, called black mass, contains cobalt, lithium, nickel, and manganese. The black mass is poured into the pilot plant and dissolved in chemical concoctions derived from fruit peel waste that has been oven-dried and ground into powder. These concoctions, which the scientists have filed a patent for, are designed to leach out precious metals over low heat.

The precious metals are then precipitated into metal salts that can then be used to assemble new lithium-ion batteries.

ntu.edu.sg

Following a successful proof-of-concept to recycle spent lithium-ion batteries using reagents extracted from fruit peel waste, NTU Singapore is partnering with Se-cure Waste Management Pte Ltd (SWM), a Singapore battery recycling and processing company, to scale up the technology in a pilot plant

Photo: NTU Singapore

LITHIUM CARBONATE FROM GEOTHERMAL BRINES

According to Watercycle Technologies Ltd, a UK tech company focused on mineral extraction and water treatment systems, it has, for the first time, successfully produced lithium carbonate from naturally occurring geothermal brines in the North East of England.

Photo: Watercycle Technologies

"This represents a major step forward in the UK's ambitions to produce a domestic supply of lithium to power the domestic energy transition and the UK Government's goals of achieving net zero," the company underlined. As reported, it applied its proprietary Direct Lithium Extraction & Crystallization process (DLEC) to successfully produced lithium carbonate crystals from brines extracted from Weardale Lithium Limited's existing geothermal boreholes at Eastgate, in County Durham.

"The DLEC process selectively removes lithium ions from complex brines using mixed matrix hollow fiber adsorption membranes followed by concentration, polishing and crystallization stages," Watercycle Technologies described the technique. "It is a low-impact, low-carbon and low-water usage method of extracting lithium from brines, which Weardale intends to augment using power from renewable energy sources." Being an end-to-end solution would enable resource owners to extract the highest possible value from a resource. "By working with an end-to-end technology provider, it is not necessary to negotiate multiple contracts with several companies that only offer one part of the process. In addition, it negates the need to ship lithium concentrates for refinement elsewhere. Shipping concentrates (comprised largely of water) is expensive and increases the travel miles of the product."

Lithium is necessary for the production of electric vehicle batteries. In order to accelerate the adoption of electric vehicles and meet net-zero targets, the UK needs a secure supply of lithium "as there is currently no commercial lithium production or refining in the UK or Europe," the firm emphasized. "Consequently, this is a significant milestone as it advances the possibility of producing domestic lithium and, in turn, advancing an integrated battery-supply chain industrial hub in the North East of England." The success so far would enable Weardale Lithium Limited to progress its step-wise plans for scaling up trials of lithium extraction using the technique of Watercycle Technologies, supporting and enabling the investment decision for the construction and operation of a pilot demonstration plant for test-scale production of lithium. The modular pilot demonstration facility is planned to be located on the brownfield, former cement works at Eastgate. The commercial production's aim is to extract approximately 10,000 tons of lithium carbonate annually.

watercycletechnologies.com

THE GLOBAL NUMBER OF SHREDDERS

The international Shredder industry is growing. According to the latest "World Shredder List" presented at the recent World Recycling Convention & Exhibition of the BIR (Bureau of International Recycling), the number has grown to 1,181. 334 Shredders of 1000 HP or more are located in the USA and 257 in the EU Member States and European Free Trade Association (EFTA) countries. In the Americas, Asia and Africa, 590 shredders are in operation, including 340 in China and 110 in Japan. One year previous, the quantity had reached 1164, including 334 in the USA, 327 in China and 253 in the EU/EFTA region.

NEW RECYCLING CENTER IN SWEDEN RELIES ON TELEHANDLER

In Vara, on the Västgötaslätten plain, the new and highly modern Heljeved Recycling Center has opened, receiving waste from private households in the municipality. The facility, operated by Avfall & Återvinning Skaraborg, covers an area of 30,000 m², the equivalent of four football fields. As a result, a traffic-safe, sustainable and flexible recycling center has been created that meets current and future needs.

Great advantage: the elevated cab provides an optimal view of the containers or truck bed

Recycling center with an intelligent and efficient concept

A simple and clear loop runs through the facility where customers drive along a two-lane U-shaped road with around 20 containers for sorting different types of waste. The plant's machines can work safely and undisturbed on the other side of the containers, separated from the customers but still at ground level. The fact that the sorting area is laid out on one level, limited only by painted lines and containers, not only provides good accessibility, but also makes it easy to adapt to the season and needs, with up to 30 containers for different waste fractions. Also, if the requirements change in the future, major layout adjustments can be made without any problems.

The recycling center in Heljeved has invested in smaller types of waste containers that customers can easily fill from the front, with additional help from the facility staff to sort correctly. For emptying the containers, the company chose the SENNEBOGEN 355 E telehandler. With the size and strength of a wheel loader and the long reach of a telehandler, the machine is ideal for multifunctional use. The 355 E is also equipped with an elevating cab, which provides the best possible view of the shovel and ensures safer and more precise work.

Avfall & Återvinning Skaraborg deploys five 355 E telehandlers in its recycling centres

Sanna, machine operator at Avfall & Återvinning Skaraborg, and Thommy Nilsson, OP System salesperson

Photos: SENNEBOGEN Maschinenfabrik GmbH

Multifunctional and flexible machine simplifies daily work at the recycling yard

The 355 E impresses with a stacking height of 8.5 metres

"Three years ago, I saw one of OP Systems' ads for the 355 E and thought it seemed to suit us," says Leif Lindqvist, Operations Manager for Recycling Centres West. "We previously had telehandlers for emptying containers etc., and they did their job in terms of reach, but the problem was that you couldn't see the working area when emptying or loading a truck, for example. With the lifted cab of the 355 E, you can see down into the container or truck bed, which is a big advantage. It is also flexible and can turn around in a heartbeat. It's just the right size." Sanna, the machine's operator, also agrees that the height-adjustable cab is a great relief in everyday work: "We used to sit underneath the shovel and tried to get a view of the working area, for example, when emptying containers." Before that, Sanna worked with a wheel loader but finds the 355 E much more flexible and maneuverable.

Besides emptying containers, the 355 E is used for several other tasks, such as moving materials (waste wood, garden compost, etc.) and keeping the area tidy. For this, the 355 E has several different attachments, such as a bulk bucket, a planer bucket, a hydraulic pallet fork and a sweeping attachment. The first 355 E was ordered in 2020, and today Avfall & Återvinning Skaraborg has five SENNEBOGEN 355 E telehandlers working safely and efficiently on recycling jobs at various waste centers in Skaraborg. In total, Avfall & Återvinning Skaraborg has 21 facilities and manages 13 of Skaraborg's 15 recycling centers, thus serving almost all of the county's municipalities. In Heljeved, four persons work daily to help people with the recycling process. "For us, it is important that we provide a good service and that customers feel welcome", says Leif Lindqvist. "The goal is to sort as much as possible and thus minimize residual waste, which is a win-win for everyone in the long run."

sennebogen.com

STRONG NEED FOR PIPE CRUSHERS

According to this latest study by Fact.MR, a provider of market research and competitive intelligence, the global pipe crusher market is expected to reach a value of 1.34 billion US-Dollar by 2033, demonstrating a compound annual growth rate of 5.1 percent over the next ten years. In 2023, the market is valued at 817.64 million US-Dollar. A pipe crusher – also known as a pipe shredder or pipe granulator – is an industrial machine designed to break down or crush various types of pipes into smaller pieces. These machines are commonly used in recycling facilities, construction sites, and other industries where pipes need to be processed for recycling or disposal.

One of the key benefits of automation in pipe crushers is improved operational efficiency, Fact.MR underlined. "Automated systems can streamline the entire crushing process, eliminating manual interventions and reducing human error. With automated feeding systems, pipes can be loaded into the crusher seamlessly, ensuring a continuous and uninterrupted operation. This not only increases the overall throughput but also minimizes downtime and enhances productivity."

factmr.com/connectus/sample?flag=RC&rep_id=8593

TOMRA LAUNCHES AUTOSORT™ PULSE WITH DYNAMIC LIBS TECHNOLOGY

Global sensor-based sorting technology provider, TOMRA Recycling Sorting, introduces a new machine featuring dynamic laser-induced breakdown spectroscopy (LIBS). Designed for high throughput sorting of aluminum alloys, AUTOSORT™ PULSE redefines industry standards.

AUTOSORT™ PULSE

Leveraging decades of experience in the metal recycling industry, the company celebrates the introduction of AUTOSORT™ PULSE to the market. Equipped with dynamic LIBS technology the new sorting system gives recyclers the means to sort aluminum by alloy classes and produce furnace-ready products for demanding applications.

Next-level alloy sorting

AUTOSORT™ PULSE combines leading-edge technology in one machine, enabling high-throughput production of green aluminum. Featuring the patented, dynamic LIBS technology, it delivers outstanding performance in the separation of, for example, 5xxx and 6xxx aluminum alloys. The machine's 3D object scanning detects each object regardless of its size and surface while multiple single-point scans enable sharper detection of materials in any condition. Thanks to its AI-based object singulation feature, even overlapping and adjacent objects can be accurately separated to maximize yield.

Conventional sorting machines like x-ray fluorescence (XRF) or standard LIBS technologies are limited in maintaining industry-level throughputs when sorting aluminum alloys.

AUTOSORT™ PULSE has a combination of the most innovative technologies, leading to peak precision and high-purity sorting results. Multiple material tests have demonstrated that purity levels of more than 95 percent can be achieved.

High volume processing

With a bulk infeed system and a processing capacity between 3 - 7 tons/hour, operators can create high volumes of recycled content, meeting industrial standards. Its relatively compact equipment footprint integrates an extensive set of technologies and a conveyor belt, making it easy to install without the need for additional, complicated material handling equipment. Furthermore, the machine's design

Sorted aluminum alloys

Photos: Tomra

protects workers from any potentially harmful or penetrating light emissions.

Matthias Winkler, Product Manager at TOMRA Recycling Sorting, states: ”We have a long-standing legacy in the metals segment and our finger is on the pulse of the market. Based on our extensive in-house knowledge, we have now extended our product portfolio with AUTOSORT™ PULSE. Customers testing the machine are impressed by its results and the operational benefits it brings.”

Data-driven results

AUTOSORT™ PULSE can be equipped with the cloud-based data platform TOMRA Insight that allows for a data-driven optimization of sorting processes through near-live monitoring. As critical sorting data is available anywhere and anytime, operators can anticipate operational issues and future maintenance requirements and be in control of the entire sorting line.

Supporting net-zero

Aluminum is a very versatile material that is a highly demanded commodity. In Europe alone, demand is expected to grow by 40 percent from 2018 - 2050.(*) At the same time, the aluminum industry is undertaking considerable decarbonization efforts to reach worldwide climate goals.

To bridge the gap between supply and demand and support the transition to a climate-neutral society, the industry resorts to recycled aluminum as recycling aluminum is 95 percent less energy-intense compared to primary production. Moreover, it prolongs the lifecycle of existing materials.

Terence Keyworth, Segment Manager Metals at TOMRA Recycling Sorting, states: “Our intensive and long-term collaboration with some of the world’s largest scrap recyclers and aluminum producers is the foundation of our development process. With our metal sorting units, we provide the technological force in driving the aluminum sector’s net-zero transition as it delivers high-quality alloy scrap fractions for producing low-carbon aluminum.”

tomra.com

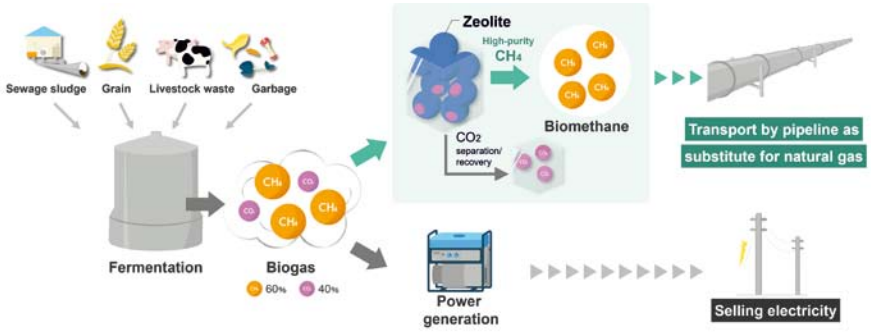
*) European Aluminum Vision 2050; 2. European Aluminum Circular Economy Action Plan, 2020

Japan:

TESTING OF BIOGAS PURIFICATION SYSTEM AT SEWAGE TREATMENT PLANT

Japanese company Asahi Kasei and Kurashiki City (Okayama prefecture, Japan) intend to hold a trial to evaluate and demonstrate the performance of a biogas purification system at the Kojima sewage treatment plant in the city.

The installation of the system was scheduled for May this year. The start of operation is planned for the end of 2023.



Graphic: Asahi Kasei

The flow of biogas; high-purity methane refinement is conducted mainly in Europe

Furthermore, the Mizushima Works of Asahi Kasei's production center and Kurashiki City concluded a comprehensive partnership agreement for realizing carbon neutrality in society. Advancing the demonstration trial for decarbonization is one of the provisions of the partnership.

Biogas from, inter alia, sewage sludge and garbage consists of approximately 60 percent methane and 40 percent CO_2. According to Asahi Kasei, the biogas purification system refines high-purity methane gas (biomethane) by removing CO_2 from biogas utilizing the company's newly developed adsorbent, K-GIS zeolite. "Unlike conventional adsorbents, which adsorb methane together with CO_2, K-GIS zeolite adsorbs almost no methane," the Japanese corporation gave account. "This enables the system to efficiently separate and recover high-purity methane while recovering high-purity CO_2." As reported, in Kurashiki City, electricity is generated using biogas derived from sewage sludge. The system would use a portion of this biogas for the demonstration trial.

"If biomethane production using the system is combined with carbon capture and utilization or storage (CCUS), the cycle would be carbon negative," Asahi Kasei stated. The system's commercialization is expected around 2025 or 2026 following additional trials in countries or regions where biogas purification is performed. "The technology will also be applied to CO_2 separation and recovery from gases other than biogas."

asahi-kasei.com

CHEMICAL RECYCLING EUROPE

September 21 – 22, 2023, Brussels (Belgium)

The Chemical Recycling Europe Forum 2023 is an opportunity for industry experts, plastics value chain representatives, academic professionals, NGOs, research institutes, and national and European authorities to gather and discuss the latest developments in the chemical recycling industry. The members of Chemical Recycling Europe share a common goal: Closing the loop for the plastics industry by offering the technology to chemically recycle all plastic waste back into its original components and/or other value-added materials, the organizers said. Established in 2019, Chemical Recycling Europe (ChemRecEurope) aims to promote and implement the use of chemical recycling solutions to benefit the economy and society. The organization represents the interests of the European sector to the public and European institutions. Moreover, it emphasizes that chemical recycling technologies are critical to promoting a more sustainable and circular economy in Europe.

chemicalrecyclingeurope.eu/post/chemical-recycling-europe-forum-2023-save-the-date

ERIEZ MAGNETIC SEPARATORS ARE HELPING THE GROWING GLASS INDUSTRY REMOVE IMPURITIES

High-intensity magnetic separation equipment from Eriez is gaining recognition among glass manufacturers for its ability to remove tramp metal particulates from the mixing and blending of raw ingredients such as silica, soda ash and limestone before the melting process in a furnace.

"The glass industry needs effective magnetic separators to eliminate metallic, magnetic and non-magnetic impurities during the glass-making process," says Tom Saccamozzone, Project Manager-Heavy Industries at Eriez. He explains, "magnetic and metal contamination not removed from the raw material causes visual and structural defects in finished glass products."

Eriez magnetic separators are designed to remove or recover metals from three types of magnetic materials used to purify glass: ferromagnetic, paramagnetic, and diamagnetic, according to Saccamozzone. In the process of making silicate glass, for example, multiple Eriez magnetic separators are used to recover trapped metals mixed in with the sand along with other raw materials. "Unwanted tramp metals are removed using Eriez ceramic drums, different types of ceramic traps and suspended magnets," Saccamozzone notes. "Typically, using these separators reduces the number of large pieces of ferrous, like nuts, bolts and mill scale."

The combination of Eriez High Intensity Rare Earth Roll Magnetic Separators, Dry Vibrating Magnetic Filters and Rare Earth Drums are magnetic separators of choice for the paramagnetic circuit, according to Saccamozzone. "Eriez has supplied high-strength magnets to purify sand below 100 parts per million. These magnetic separators are used while making high-purity sand and other minerals used in specialty glass," he says. Eriez Eddy Current Separators are utilized to repel highly conductive materials such as aluminum, brass, and copper in the diamagnetic circuit. The company has supplied Eddy Current Separators in this industry to repel the aluminum and brass out of the cullet prior to introducing the cullet into the furnace. "This not only cleans the cullet, but it also ensures the brass and other pieces from the molds do not make their way into the furnace, causing damaging results. This could lead to the destruction of the wall of the furnace and cause a costly shutdown," Saccamozzone says.

eriez.com

TORQUE LIMITER FOR DIRECT DRIVES

The series ECPB from German manufacturer ENEMAC is a combination of a torque limiter with a clamping hub and a metal bellows coupling to avoid expensive damages through overload in the drive chain of recycling machines. The metal bellows ensure axial, angular and lateral offset compensation between the input and output shaft.

Available for disengagement torques between 0.5 Nm and 9,000 Nm, in 19 different sizes, the coupling with bellows is versatile. The clamping hub of the metal bellows coupling can accommodate bores between five and 130 millimeters (mm), the clamping hub in the safety part is available for shaft diameters between five and 120 mm. The metal bellows can compensate axial misalignments up to three mm, lateral up to 1.4 mm and angular up to 1 °.

The clamping hub, which is attached on both sides and is easy to assemble, connects the shaft and coupling free of clearance and with a positive fit. There is another version with an additional feather key groove on customer's request. The quick and easy clamping by means of clamping hubs makes it easier for the fitter to install and remove the torque limiter and thus ensures short downtimes during system maintenance.

ENEMAC also offers this safety coupling as a corrosion-resistant variant ECPB_KS for demanding environments. For this purpose, the main components of the torque limiter are nitro-carburized or gas-nitrided and then oxidized. The built-in disc springs are coated, and the bearings' small components are made of stainless steel. That makes the coupling type suitable for many outdoor applications and wherever moisture could become problematic.

enemac.de/en/

Foto: ENEMAC

PANIZZOLO RECYCLING PLANTS FOR METAL WASTE TREATMENT

Panizzolo recycling offers a refining plant for the recovery of the metallic fraction from mixed waste that allows to obtain a high level of purity of the secondary raw material. The refining plant offers high efficiency on large quantities and flexibility, allowing you to modulate the plants started up based on market changes and always be ready for any eventuality. The refining plant has various benefits and competitive advantages compared to the current products on the market.

Panizzolo Refining Plant

To address the large quantities of copper-rich metals, aluminum, and brass that are destined for landfills or exported due to the high presence of inert materials within them, Panizzolo has developed increasingly efficient treatment plants over time, capable of recovering even the smallest amounts of metal in-line.

The solutions offered by Panizzolo are the Master Refining Plant and the Refining Islands:

1) The Master Refining Plant is flexible and designed for the processing of large batches of material or a continuous standard of mixed waste input. Its in-line setup enables processing in a single production cycle, optimizing energy consumption and maximizing the result of the processed waste.
2) The Refining Islands consist of separation and refining treatment modules that allow the customer to optimize energy expenditure, reduce the impact of machine downtime on the plant, and distribute the processing cycle over different timeframes. All of this promotes higher profitability for small waste batches. The design of specific treatment groups that are independent of each other maximizes metal recovery from mixed and highly abrasive waste, offering the possibility of step-by-step processing based on customer needs in terms of production, quality, and quantity. Compared to the Master Refining Plant, the Refining Islands also optimize space more effectively, both logistically and from a production standpoint.

Panizzolo's refining plant and islands are equipped with technologies and software developed to maximize the profitability of mixed waste treatment, reduce management and personnel costs, and ensure the elimination of non-marketable by-products. Both solutions allow for the processing of mixed waste fractions containing steel and abrasive inert materials, while also recovering even the smallest metallic fractions, resulting in high-quality granules of copper, aluminum, brass, and steel, all the way to complete sorting by commercial type.

The main strengths of Panizzolo's refining plants are:

- **Application Fields**
  The Panizzolo refining plant is designed to treat materials that are usually difficult to process, such as mixed metal fluff, car fluff, or WEEE fluff.
- **Prevents Production Downtime**
  Thanks to Panizzolo's patented plant elements, the treatment of highly abrasive materials is effective and prevents situations that could cause machine downtime.
- **Flexibility and Efficiency**
  All plant elements have multiple adjustments that allow for quick and easy changes in the type of waste input.
- **End-of-Waste Cycle**
  Also, thanks to Panizzolo's patented elements, even materials that are

Photos: Panizzolo

typically difficult to treat are refined, offering excellent output in terms of purity and classifying them as secondary raw materials.

The Panizzolo refining plant maximizes the valorization of mixed waste treatment, bringing great benefits to the environment.

Important components of the plant include:

- **Refining Hammer Mills**
  The valorization of metallic granules is carried out by mills with specific Panizzolo hammers with fusion armor, ensuring component longevity, uniform wear, and higher performance in volume reduction while maintaining consistent metal quality in the output.
- **Dedicated Separation Systems**
  The plant employs easily implementable modular technologies managed by a control software for simple maintenance.
- **Density Separation Tables**
  Panizzolo density separation tables are low-energy-consumption machines with an easy and quick access during periodic maintenance, resulting in significant time savings.

Output Material Quality

The technological qualities of the Refining Plant and Refining Islands allow for the processing of mixed materials containing abrasive inert substances, which are notoriously difficult to treat and valorize, and over time could reduce the effectiveness of the processing. Through continuous research and development of its refining plants, Panizzolo has created solutions capable of separating even smaller quantities of waste materials such as plastics and inert substances, ensuring that the vast majority of non-marketable by-products are eliminated at the end of the treatment cycle. This results in obtaining only clean metal granules that can be classified as secondary raw materials.

panizzolo.com

ROKBAK RA40S AT INDONESIAN NICKEL MINE

On an island on the edge of the Pacific Ocean – 2,000 kilometers northeast of Java – a trio of Rokbak haulers "RA40" operate across a 45,065-hectare mining site. At this remote location in North Maluku, Indonesia, the haulers operate up and down steep inclines, through mud, dirt, grit and gravel, for close to 24 hours a day.

Required to move around 450 tons of biomass and quarry materials in a single day, each RA40 will record approximately 6,000 operating hours per year, Rokbak pointed out. The haulers were tasked with removing overburden and providing mine development support for securing high-demand nickel. "Every full-capacity payload sees each RA40 transport overburden two kilometers to a project access road and biomass dump for disposal."

The three Rokbak haulers were acquired by company PT Hillcon, one of the well-known firms in construction, mining, property and heavy equipment industries in Indonesia. "Since its beginnings in 1995, the company has completed hundreds of projects across the archipelago in coal and nickel operations," the manufacturer of the haulers informed. "Its current occupation in the world-class nickel deposit of Weda Bay, in North Maluku, is a five-year process that began in September 2021. It will last until Q4 2026, by which time it will have produced an estimated four million tons of nickel."

rokbak.com

Hillcon's operators like the visibility and comfort that the RA40 provides

Photo: Rokbak

Steinexpo 2023:

KLEEMANN PRESENTS SUSTAINABLE SOLUTIONS FOR QUARRYING AND RECYCLING

At this year's Steinexpo, Kleemann showcases innovative mobile crushing and screening plants and the SPECTIVE operating concept from its comprehensive product portfolio. A wheel loader from John Deere will also be on show for the first time at Steinexpo. The trade fair appearance will focus on cost-effectiveness, operability and sustainability.

The Kleemann MSS 802(i) EVO impresses as a scalper in natural rock and recycling

Powerful: Quarrying and Recycling

With the MOBIREX MR 130(i) PRO impact crusher Kleemann presents the latest member of the PRO line. The machine is used as a primary and secondary crusher and combines output, precision and sustainability. Thanks to its all-electric drive concept with the option of an external power supply and operation with zero local emissions, the plant guarantees low energy consumption. The optional large double-deck post screening unit permits the production of two classified final grain sizes. The MR 130(i) PRO covers a wide application range in natural stone and recycling. With its heavy rotor and powerful 250 kW electric drive, the crushing unit guarantees a very high and stable throughput. A continuous crusher load is guaranteed by the Continuous Feed System (CFS).

SPECTIVE operating concept

The innovative operating concept SPECTIVE includes various components that are ideally tuned to one another. Apart from the intuitive touch panel and different radio remote controls, the digital application SPECTIVE CONNECT, supports the work site digitalization. All relevant process information and reporting are now displayed on the smartphone without having to leave the feeding device. Moreover, the "Smart Job Configurator" tool supports the operator in choosing the correct machine settings, facilitates day-to-day work and ensures even greater cost-effectiveness.

Kleemann screening range extended

The new MOBISCREEN MSS 802(i) EVO has been designed as a powerful mobile scalper for changing challenges in different applications. With its clever plant design and flexible conversion options, it guarantees an optimum material flow in natural stone and recycling applications. The large range of screen media and the simple setting of the screen parameters allow the MSS 802(i) EVO to easily adapt to new operating conditions. If a fine final product is to be screened from particularly coarse feed material, the machine can be quickly converted from three to two final grain sizes. Further advantages of the plant include its simple operability thanks to its intuitive control system, easy access to all relevant machine components and its drive concept with the option of an external power supply for operation with zero local emissions and therefore environmentally friendly work.

The John Deere wheel loader 744 P-Tier will be on show for the first time at Steinexpo. It combines top performance with power and is the ideal loader for the powerful Kleemann scalper. With the 824 P-Tier another John Deere wheel loader will demonstrate its skills in the demo area.

Specially designed for the quarry

Kleemann offers various size classes for the quarry. With the MOBICAT MC 120(i) PRO a jaw crusher from the PRO line is showcased at Steinexpo, which impresses with high performance capacity, very good accessibility and its all-electric E-DRIVE drive concept. The mobile cone crusher MOBICONE MCO 90(i) EVO2 is known for its high degree of flexibility and easy transport. The optional double-deck post screening unit, which enables the classification of up to two final grain sizes, is new to the plant. The operation of both machines is intuitive thanks to the SPECTIVE operating concept. They can also be equipped with SPECTIVE CONNECT.

wirtgen-group.com

Photo: WIRTGEN GROUP

Plastic Recycling:

COST EFFICIENCY IN MELT FILTRATION

Recyclates of the highest quality are a highly sought-after commodity in the plastics processing industry. In line with demand, stricter requirements are also being placed on the productivity of the recycling systems.

German-based company Ettlinger, the center of competence for recycling in the MAAG Group, offers a solution for providing corresponding product quantities for the recyclable material cycle. According to the manufacturer, its flagship is the powerful high-performance melt filter ERF 1000. “When processing easy-flowing materials, for example, for injection molding applications, its four rotating, perforated drums can filter up to ten tons of plastic melt per hour,” the company informed. “The system’s benefits include continuous operation in a stable process at consistent pressure and long operating times without filter changes.” The very low melt loss in the range of a few percent and the possibility of changing each drum individually and without interrupting production also would contribute to the cost efficiency of the ERF 1000. If throughputs lower than those provided by the ERF 1000 are sufficient, the ERF 350 (up to more than 3,000 kilograms/hour) and ERF 500 (up to 6,000 kilograms/hour) offer alternatives to meet such requirements. “All three sizes are designed for energy efficiency and are suitable for filtering common thermoplastics, including soft PVC,” the company said. “The proportion of contaminates such as paper, aluminum, wood, elastomers (rubber or silicone) or high-melting polymer composites can be up to 16 percent.” ERF melt filters can, in principle, be used in any extrusion line – either single or twin-screw and irrespective of the type of pelletizing system or other downstream unit.

Recycling of PE, PE-HD and PP are among the most common industrial applications of the ERF 1000 continuous melt filter

Photo: Ettlinger

maag.com/ettlinger/

MAGUIRE EXPANDED WEIGH SCALE BLENDERS SERIES

According to US-based manufacturer Maguire, growing demand for the use of post-consumer content, surcharges on virgin resign, and global legislative policy proposals and adoptions are being enforced around the globe. “These new challenges have plastics processors looking for economical solutions to incorporate additional materials, more diverse materials and changing material content in their final product,” Maguire emphasized. The WSB Series of blenders would allow flexibility to handle up to six major components such as multiple PCRs, Virgin or Regrind. The new Maguire Weigh Scale Blender (WSB) 600 Series has a throughput range up to 2,500 pound/hour (1.13 ton/hour) and is suitable for injection, extrusion, blow molding, and central blending applications, the company informed. It would add another model to Maguire’s robust line of Weigh Scale Blenders, “which already includes over 150 configurations suited to every process and application requirement.”

Photo: Maguire

www.maguire.com

STEINEXPO 2023

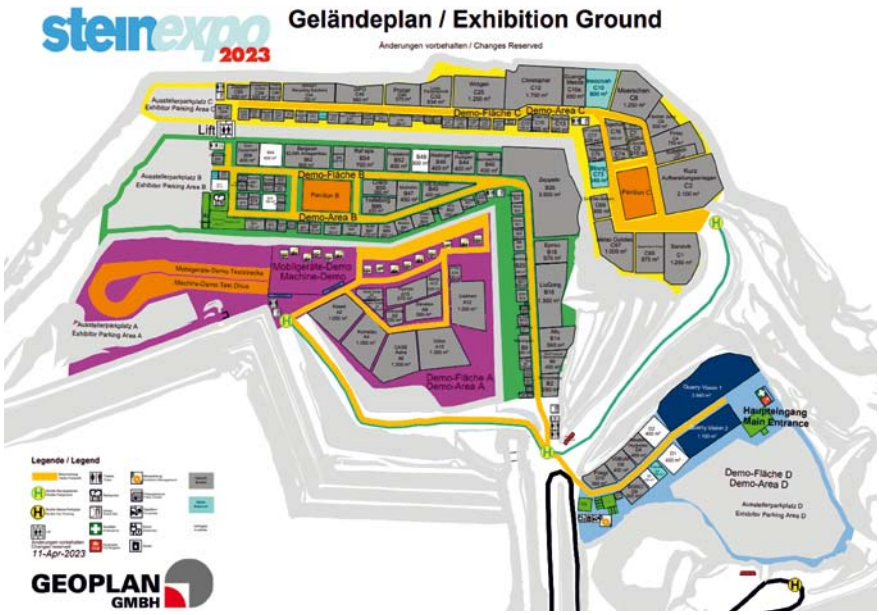
August 23 – 26, 2023, Homberg (Germany)

When the 11th steinexpo demonstration fair opens its doors on 23 August 2023, trade visitors can explore a much wider selection of information than usual, the organizers announced. This time, all visitors would experience a much greater involvement in the daily routine of the event. “From mid-August, the set-up and, of course, the trade fair itself will be recorded by a permanent videocam with live transmission. This will give people interested in the trade fair as well as participants an equal opportunity to experience the fair in advance and, naturally, while it is taking place.”

As usual, the live demo area will feature moderated live joint demonstrations by major construction machinery brands. The “stadium atmosphere” would allow spectators in the stands to experience the performance of the loading and transport equipment being used in real-life conditions, the organizers underline. This year, a 45 spare meters LED wall on which the live action of the massive machines at work are shown – with special features being zoomed in on and explained in detail – would complete the presentations and demonstrations.

The trade fair is held in a three-year cycle. Using live demonstrations against the backdrop of a stone quarry, manufacturers and dealers of building and processing machinery, utility and heavy vehicles as well as plants for the extraction and material treatment put their performance capabilities on display. The recycling of mineral building materials represents another focus point. Geoplan GmbH, Iffezheim, organizes the steinexpo.

steinexpo.eu



Source: Geoplan

CENTRAL ASIA PLAST WORLD

September 28 – 30, 2023, Almaty (Kazakhstan)

Messe Düsseldorf, the organizer of K, the plastic and rubber industry trade fair, has expanded its international portfolio to include a trade fair in Central Asia – Central Asia Plast World. The event is being held for the 15th time by local organizer Central Asia Trade Exhibitions. With 65 exhibitors from 13 countries and 2,700 trade visitors, Central Asia Plast World is an important business platform for plastics and rubber in Central Asia, providing an extensive range of products and services, including plant and machinery, raw and auxiliary materials, recycling, as well as semi-finished products and technical parts.

k-globalgate.com/en/Global_Portfolio/Central_Asia_Plast_World/Central_Asia_Plast_World_-_Facts_Figures

POLLUTEC

October 10 – 13, 2023, Lyon (France)

Over four days, professionals will present innovative solutions to address urgent issues such as biodiversity depletion, pollution, climate change, and energy management. Pollutec fosters a collaborative environment for knowledge-sharing and problem-solving among communities and other economic actors. Pollutec also offers a comprehensive program that includes conferences, keynotes, workshops, and demonstrations exploring environmental sector innovation and market trends. It serves as a hub for business opportunities for the French and global export markets. Its 11 exhibition areas provide a platform for pollution prevention and treatment equipment, technologies, and services while promoting sustainable development and environmental preservation. Furthermore, Pollutec brings together stakeholders of the ecological transition and boosts their connections, including solution providers, leaders, start-ups, managers, decision-makers, project leaders, investors, elected representatives, etc.

pollutec.com/en-gb.html

Photo: UXO / Pollutec

WASTE EXPO BRASIL

October 3 – 5, 2023, São Paulo (Brazil)

Expo Brasil 2023 will unite local and global companies dedicated to recycling, public cleaning, solid waste management, and waste to energy. During the three days of the exhibition, companies will have the opportunity to showcase their products and services face-to-face to hundreds of interested and qualified individuals. Furthermore, exhibitors will be able to display a full range of equipment for recycling and MSW management, including machines and vehicles.

wasteexpo.com.br/index.php/en/

ECOMONDO

November 7 – 10, 2023, Rimini (Italy)

Ecomondo, as the organizers clarified, is the place for industry, stakeholders, policymakers, opinion leaders and local authorities to meet and talk. It brings together and systemizes the key elements that define the development strategies of the European Union's environmental policy. The international event in Europe and the Mediterranean basin focuses on technologies, services and industrial solutions in the green and circular economy sectors, as it encompasses a wide range of fields, including water management, waste disposal, textiles, bioenergy, soil management and protection, transport, agriculture, and sustainable cities. The exhibition will serve as a platform to discuss various topics related to the National Recovery and Resilience Plan (PNRR), circular economy in industrial supply chains, and the ecological regeneration of soil, hydrosphere, coastlines, and cities. In addition to the main event, there will be both virtual and in-person meetings aimed at providing opportunities to address these issues.

en.ecomondo.com

GLOBAL RECYCLING – The Magazine for Business Opportunities & International Markets

9. Volume 2023
ISSN-Print 2365-7928, ISSN-Internet 2365-7936

Publisher:
MSV Mediaservice & Verlag GmbH
Münchner Str. 48, D-82239 Alling GT Biburg, GERMANY
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Advertisement Price List No. 40 currently valid.

Media Planner 2023: global-recycling.info/media-kit

Publication Frequency:
The magazine appears three times a year. If the magazine cannot appear due to force majeure, such as a strike, this shall not give rise to any claims against the publishing house. Attributed contributions do not necessarily represent the opinion of the editors. For unsolicited sent-in manuscripts and photo material the publishing house does not assume any liability.

Printers:
StieberDruck GmbH, 97922 Lauda-Königshofen

Closing for the Next Issue:
3/2023 – 07.09.2023 (Release Date: 06.10.2023)
Topics: Paper and Plastic Recycling, Textile Recycling, Water Treatment, Organic Waste, Recycling Technology, Waste Management (Ecomondo-/Pollutec-Special)

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MOBISCREEN MSS 802 EVO

MSS 802 EVO

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