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10th October - 15th October, 2022

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Recycling and Trade

Brigitte Weber
Editor-in-Chief

In June this year, at the meeting of the Basel Convention, environmental groups claimed that new rules restricting plastic trade are being ignored. According to a press release, the Basel Action Network (BAN) and member organizations of the Break Free from Plastic movement (BFFP) charged the exporting countries "with failing to uphold the agreements to control plastic waste exports made at the Basel Convention in 2019, which came into force on January 1, 2021".

However, export restrictions have a problematical reverse side with global impact. This was underlined by Antoine Stilo at the meeting of the International Environment Council during the BIR World Recycling Convention & Exhibition in May. The Policy Officer at the European Recycling Industries' Confederation (EuRIC) warned that the draft of the EU Waste Shipment Regulation revision – in its current form – would lead to crumbling prices, job losses and many companies going out of the market because it is not profitable anymore. "It's bad for the circular economy, bad for the recycling industry, bad for recycling, bad for greenhouse gas emissions and bad for environmental protection," he was quoted by BIR. As reported, he expressed particular concern at the lack of distinction made between green-listed and other wastes, resulting in non-OECD countries wanting to receive the former would be saddled with "a very burdensome administrative procedure". The apparent political will to retain materials within Europe "could have dramatic economic consequences for European recyclers" given that, without exports beyond the EU, "we don't have a compensating demand within Europe", he was cited.

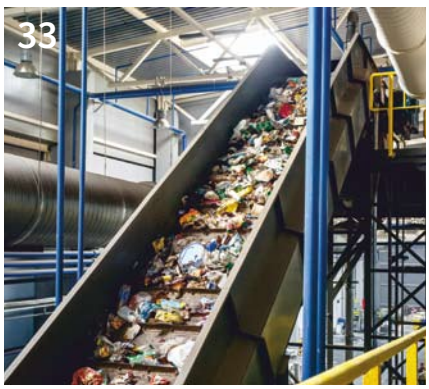
BIR President Tom Bird shares his opinion. During the meeting of the world recycling organization's latest General Assembly, he highlighted the potentially "disastrous" consequences of proposals for a significantly stricter EU Waste Shipment Regulation, which would directly affect not only Europe's exporters but also importing businesses around the globe. "This is not just a European problem," he underlined according to BIR. "Global free trade in recycled raw materials is essential for a truly global circular economy," he said and urged the attendees "to become involved in this debate, to promote the truth about our industry's exceptional skills and to challenge misconceptions about what we do."

International trade of secondary materials is important. Regarding plastics, recyclers are struggling to source sufficient feedstock (page 3), but the present and future market situation is quite promising (pages 5 to 7) and provides many business chances, also owing to the progressing digitization (page 20). There are further opportunities: Vietnam is on the way to a circular economy (page 24) and Rwanda is a forerunner in e-waste recycling (page 27).

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

Yours
Brigitte Weber (weber@msvgmbh.eu)

Cover Photo: PHD Marketing Limited



Keyword Plastics: RECYCLERS‘ PLEASURES AND PAINS

At the recent World Recycling Convention & Exhibition of the Bureau of International Recycling (BIR), held in May in Barcelona (Spain), the huge demand for recycled plastics was the focus of the meeting of the world recycling association’s Plastics Committee.

Although plastics recyclers are enjoying the benefits of “massive demand and extremely high prices”, they are struggling to source sufficient feedstock to enable them to cope with this “undoubted boom time”, the global federation of recycling industries cited board member Max Craipeau of Hong Kong-based Greencore Resources Ltd in chairing this meeting. As big brands want to use more recycled content in their products due to circular economy and sustainability, the recyclate market is currently quite tight.

According to BIR, an initiative intended to enhance global flows of quality recycled plastics was described by guest speaker Doug Woodring. The new Rebound Plastic Exchange, for which he is lead expert, “is scheduled to go live in late August” and will seek to serve as a transparent global trading platform aimed at facilitating movements of bales, pellets and flakes based on “certification, verification and trust”. By implementing standardized facility inspection protocols and using well-known, global certification bodies, the exchange would look to build confidence in this trade, he pointed out. At the same time it would drive the innovation and investment required to boost circularity and propel the current global plastics recycling rate beyond its lowly 10 percent.

Identifying lack of feedstock as the main challenge, Doug Woodring contended that investment of 56 billion US-Dol-

Photo: TOMRA

The Future Rebound Plastic Exchange

The mission of the UAE-based new trading platform for recycled plastic, established by International Holding Company (IHC), is to facilitate the movement of quality assured feedstock across borders in a regulatory compliant way. It aims to "increase plastic recycling while addressing a global environmental challenge through an economically beneficial business model". Currently the Rebound Plastic Exchange is scheduled to open for trading end of August this year. "Beta testing of the site will take place during August 2022, and the exchange is offering select buyers and sellers the opportunity to trade for free." More information for interested individuals: www.reboundplasticexchange.com. According to the information, like existing trading platforms the Rebound Plastic Exchange (RPX) is creating a similar trading solution for plastics. "By using a common global language through our specification sheets, both developed and developing countries will benefit from the facilitation, which RPX will provide, thus building confidence in trades while complying with regulations and international standards such as the Basel Convention." Buyers and sellers would need to register and become members of RPX in order to transact trades on the platform. Initially, the platform will be including some 15 of the most common traded plastic materials. "These specifications have been developed in consultation with experts in the sector based on national and international trends on markets, price, quality, equipment and processes. The purpose of this suite of specifications is to provide companies greater clarity on product quality while also providing regulatory guidance; with respect to conformity of a shipment with applicable legal requirements in the country of export, the country of import and any transit countries."

lar is required in the plastics processing infrastructure over the next five years, rising to 400 billion US-Dollar by 2040. "Many, many big brands now finally are trying to get more recycled content into their products," he was quoted by the world recycling association. As reported, this is proving to be "a giant challenge" because the necessary supply chains were not in place and "you cannot find the feedstock". According to the guest speaker, the market for recycled material is forecast to grow around 30 percent from 2020 levels to 45.6 billion US-Dollar by 2025. "This is a very great opportunity for those of you in the recycling industry," he declared, cited by BIR. But until the necessary infrastructure investments had been made, the annual shortfall of recycled material would be a minimum of six million tons.

Dr Steve Wong of Fukutomi Recycling Limited, who is also Executive President of the China Sustainable Plastics Association, identified an urgent need for more investment in the upstream collection, sorting, grinding and washing infrastructure. In the Far East, he maintained, "most factories operate at less than 20 percent of their capacities". Noting the Rebound Plastic Exchange's focus on achieving consistency in inspection and quality, Sally Houghton of The Plastic Recycling Corporation of California insisted: "We need standardization at the collection level as well." And Natalia Cruz of Spain-based Ferromolins SL welcomed the exchange initiative as "a very useful tool" for all of those businesses involved in the search for solutions to circular economy challenges. On the issue of supply, Max Craipeau also identified hugely increased shipping costs as "really restricting the flow of material globally", BIR reported.

Whereas a 40-foot container heading from Asia to Europe or the USA two years ago would have cost around 2,500 US-Dollar, the outlay was now nearer 15,000 US-Dollar. Among the other pressures on the plastics recycling sector, he listed the impacts of the Ukraine conflict, high energy prices, inflation and lack of labor.

www.bir.org

GLOBAL WASTE RECYCLING SERVICES MARKET PROJECTED TO GROW

MarketInsightsReports.com – which provides market research reports and industry analysis – offers a report on global waste recycling services.

According to the study published by market research company LP Information Inc., the worth of this market was projected to increase from 376,010 million US-Dollar in 2020 to 391,860 million US-Dollar by 2026, Market Insight Reports informed. This analysis would present "a comprehensive overview, market shares, and growth opportunities of waste recycling services market by product type, application, key players and key regions and countries."

www.marketinsightsreports.com/reports/02255764294/global-waste-recycling-services-market-growth-status-and-outlook-2021-2026

Promising Market Situation:

OPPORTUNITIES, OPPORTUNITIES ...

There are several market reports, which predict a positive outlook.

According to US-based Vantage Market Research, the Global Plastic Waste Management Market, which was valued at 33.5 billion US-Dollar in the year 2021, is forecasted to reach 39.7 billion US-Dollar by the year 2028 and is expected to grow exhibiting a compound annual growth rate (CAGR) of 2.9 percent during the forecast period.

Growing consumption of plastics has generated huge amounts of waste in recent years, the firm stated. The increasing awareness programs initiated by government bodies were helping manufacturers to use biodegradable plastics and reduce unnecessary plastic consumption. "The demand for plastics is increasing rapidly, according to global plastic consumption, 367 metric tons of waste was generated in 2020, and 82 percent ended in waste," the company wrote. About 40 percent of plastic materials worldwide were used to stock and package finished products from different factories. "Plastics had a significant contribution in creating a sustainable, proper, hygienic, cost-effective, energy-efficient, and environmentally friendly packaging system that can keep the environment clean, but this is insufficient without maximizing plastic recycling and treatment plants. This is hindering the market growth."

A more optimistic outlook regarding the value of the Plastic Recycling Market provided India-based Market Data Centre. As reported, this global market size is projected to grow from 46.1 billion US-Dollar in 2022 to 72.6 billion US-Dollar by 2030, at a CAGR of 8.6 percent during the forecast period (2022-2030). North America is expected to hold a considerable share in the global market, the firm informed. Asia-Pacific is anticipated to grow at a faster pace.

"The growing number of plastic recycling market players across regions is expected to drive market growth further. Moreover, increasing investments by prominent vendors in product capabilities and business expansion is expected to fuel the market during the study period. Many market players are finding lucrative opportunities in emerging economies like China and India, where the large populations are coupled with innovations in numerous industries."

The Global Circular Polymers Market was analyzed by Dubai-based Fact.MR. The company found that this market is projected to expand at a CAGR of around 9.1 percent and reach a valuation of 163.9 billion US-Dollar by 2032, attributed to factors such as growing demand for recyclable polymers in the packaging and construction sectors. "Consumers around the globe are placing a higher value on sustainable materials than conventional plastic, resulting in a shift in the notion of recyclable products," the market research firm gave account. "Over the years, this has driven the demand for recyclable polymer products across geographies." Backward supply chain integration from manufacturers to feedstock material suppliers would assist them in improving quality, enhancing their profit margins, and gaining a competitive edge. "This will allow corporations to use proprietary technology to produce higher-grade recyclable polymers, thereby improving the quality of polymers at a lower cost."

Photo: Andi Karg

As underlined, plastics is accounting for eight percent of the global yearly fossil fuel production. "Many companies are attempting to make a variety of products out of plastic trash, and biofuel is one of the most promising products from plastic waste," Fact.MR suggested. "Biofuel is an engine alternative fuel. The method of catalytic pyrolysis is used to transform waste plastic into biofuel, with dry wood and ash powder as the major catalysts. Catalyst addition improves conversion and fuel quality." Turning waste plastic into 65 percent usable liquid hydrocarbon fuels while generating no emissions is the idea in place. It would also deal with dangerous plastic trash and lower the imports of crude oil. "Plastic fuel and its many blends emit far less carbon monoxide and unburned hydrocarbons than diesel fuel; however, emissions are higher for nitrogen oxide. Large-scale manufacture of plastic fuel from various plastics can be economically profitable."

www.vantagemarketresearch.com/plastic-waste-management-market-1605/request-sample

www.marketdatacentre.com/sample/13985

www.factmr.com/report/circular-polymers-market

RECYCLED PLASTIC MARKET REPORT

As reported by Indian-based market research firm Prescient & Strategic Intelligence, the global recycled plastic market size is expected to be worth about 124,314 million US-Dollar by 2030.

In 2021, the market stood at an estimated revenue of around 59,777 million US-Dollar in 2021, "which is projected to advance at a CAGR of 8.5 percent during 2021–2030". The growth of the industry was primarily attributed to the surging focus on reducing plastic waste volumes, supportive government policies and initiatives to increase the adoption of recycled products; and growing consciousness of energy savings, the firm explained.

The revenue generation from plastics recycled from packaging materials is expected to grow with over eight percent CAGR during the forecast period in the market. "This can be attributed to the relative ease of recycling packaging materials generated from

bottles, films, pouches, and wraps; high demand for reprocessed products; and ease of commercial adoption of mechanical recycling for packaging waste."

The Asia-Pacific (APAC) region, which – depending on context – generally includes East Asia, Oceania, the Russian Far East, South Asia, and Southeast Asia, is estimated to have accounted for the largest revenue share of 52.3 percent in the recycled plastic market in 2021. As underlined, this part of the world has a "high capacity for producing recycled plastics, owing to high-volume imports of plastic waste and availability of domestic waste, and low labor costs, which allow for easier operation of labor-intensive allied operations, such as collection, cleaning, and sorting". These factors had assisted in the development of low-to-high reprocessing facilities in several countries in the region, such as China, Thailand, Malaysia, Indonesia, Vietnam, and India.

However, the European market is expected to grow at a CAGR of over 10 percent in terms of revenue. "This can be attributed to the development of domestic recycling facilities, government initiatives for resurging local manufacturing, and environmental sustainability targets aimed at integrating recycled products across the packaging supply chain," the company informed.

www.psmarketresearch.com/market-analysis/plastic-recycling-market

Foto: Harald Heinritz / abfallbild.de

GROWING PLASTIC MARKET

The "Plastic Films & Sheets Global Market" report has been added to the offering of ResearchAndMarkets.com.

According to the information, the global plastic films & sheets market size is projected to reach 155.1 billion US-Dollar by 2026 – from 123.8 billion US-Dollar in 2021 – at a CAGR (compound annual growth rate) of 4.6 percent during the forecast period. In this market, linear low-density polyethylene (LLDPE) accounts for the largest share of the total market. However, the demand for Polyamide (PA) film type

is projected to increase at a faster rate in the near future, the company gave account. This market would be driven "by its clear and printable thermoplastic nature and other properties such as high melting point, exceptional strength and toughness, and good oxygen barrier. It is also scratch, puncture, and flex-crack resistant and does not dissolve or absorb grease, oil, and acidic food."

Based on application, the plastic films and sheets market is segmented into packaging and non-packaging. The packaging segment accounts for the

Photo: Harald Heinritz / abfallbild.de

largest market share and is categorized into food (the largest share in this market), pharmaceutical and medical, consumer goods, industrial, and other packaging applications, which include tobacco, personal care, and home care packaging. The non-packaging segment includes agriculture, construction, medical and healthcare, and other non-packaging applications such as electronics, automotive, and industrial. Agriculture is the largest application of plastic films and sheets in this segment.

As reported, the Asia-Pacific region (APAC) is the largest market for plastic films and sheets. The report forecasts that the market share "is primarily attributed to increasing demand for plastic films and sheets in emerging economies, such as India, China, Indonesia, Malaysia, Vietnam, Singapore, and Thailand, in the region". Moreover, growth in population, increasing urbanization rate, changing trends, and expanding disposable income were driving the consumption of food, particularly, packaged foods.

In addition, growth in industrialization, increasing demand due to changing demographics, and government initiatives to attract business investments in various industries including packaging, construction, pharmaceuticals, industrial, and electronics are also driving the market for plastic films and sheets in the region, Research and Markets underlined.

https://www.researchandmarkets.com/reports/5567753/plastic-films-and-sheets-market-by-material-type

GREENGROUP RAISES FINANCING IN RECYCLING SECTOR

Backed by private equity investor Abris, one of the largest integrated recycling groups in Central Europe raises 127 million Euro to accelerate its regional expansion.

Abris Capital Partners has supported Romania-based GreenGroup in a 127 million Euro (about 133.800 million US-Dollar) fundraising to accelerate its growth and support the surging demand for recycling and sustainable products in the region. The financing will allow GreenGroup "to build on the successful growth already delivered since Abris' entry and accelerate its plans to scale up its operations across the region, developing unique solutions to recycle previously discarded materials and to penetrate new segments". The funding would allow the group to quadruple its rPET capacity to 28,000 tons and almost double its glass and WEEE recycling capacities to reach 150,000 tons and 73,000 tons respectively. In addition, the group intends to expand into electrical motor recycling, and residual derived fuel production, as well as invest in various environmental, social, and governance (ESG) programs including several photovoltaic projects.

Abris first invested in GreenGroup in 2016, acquiring majority control of the Romanian integrated recycling group. Since then, the business has expanded rapidly and now has the capacity to process 280,000 tons of waste per year, including PET, electronic equipment, lamps, batteries and glass, at 10 production facilities across Romania, Slovakia and Lithuania. In addition to its organic growth, the Romanian company has pursued an ambitious M&A strategy across all its divisions in Central Europe. The group expanded at the end of 2019 into Slovakia and Lithuania, where it operates two modern PET recycling facilities. Moreover, in 2020 Abris acquired a 100 percent stake in Eltex Recycling, one of the leading industrial waste management players in Romania, allowing GreenGroup to take one more step toward a circular economy model.

www.green-group-europe.com/en
www.abris-capital.com

Photo: GreenGroup

NEW FUND TO SCALE BREAKTHROUGH CIRCULAR SOLUTIONS

Managed by Demeter and Cycle Capital, the impact investing Circular Innovation Fund (CIF) aims at scaling growth-stage circular innovations.

Cycle Capital and Demeter, two cleantech-focused capital managers, announced one day ahead of Earth Day in April the first close for the new 160 million US-Dollar (about 150 million Euro) Circular Innovation Fund with the participation of anchor investor L'Oréal. The French multinational cosmetics and beauty company is contributing 50 million Euro through its "L'Oréal for the Future" sustainability program. The fund also benefits from a broad range of investors including, strategic investor Axens, family offices including Haltra and Claridge, as well as private investors and the managers, the information says.

According to L'Oréal, the new fund "will support start-ups and companies across North America, Europe and Asia, which are developing circular use of resources across various sectors, including new materials from the bioeconomy, circular solutions for packaging, recycling & waste, logistics, eco-efficient processes". As an impact-investing fund, it would utilize a robust, reliable, and innovative impact measurement methodology that integrates due diligence and continuous monitoring of critical non-financial KPIs (key performance indicators) including greenhouse gas emissions reductions, resource use and diversity over the investment horizons of portfolio companies.

As reported by the fund managers Cycle Capital and Demeter, CIF is classified as Article 9 under the EU's Sustainable Finance Disclosure Regulation. "The fund managers' compensation is also aligned on the achievement of a selection of pre-determined impact goals."

Consecutive to the first close, CIF would announce indirect investment in two early-stage funds focused on circular innovation – U.S.-based Closed Loop Venture Fund II and European Circular Bioeconomy Fund (ECBF).

- "Founded in 2014, Closed Loop Partners is a New York-based investment firm, comprised of venture capital, growth equity, private equity and catalytic capital, as well as an innovation center focused on building the circular economy. The firm's venture capital arm, Closed Loop Ventures Group, was launched in 2017 with one of the first venture funds dedicated to investing in disruptive, early-stage companies developing breakthrough solutions to accelerate the transition to the circular economy. In 2021, the Group launched its second venture fund to build on this strategy. To date, the team has made 30+ investments across both funds, targeting strong, early-stage venture returns.
- ECBF is the first venture fund exclusively dedicated to investing in growth-stage companies in the European bioeconomy, including the circular bioeconomy. The fund aims to make sustainable investments in our future and speed up the shift from a fossil-based to a bio-based economy. Thus, ECBF backs up businesses with high potential for innovation, favorable returns, and sustainable impact."

As reported, the Circular Innovation Fund would also sponsor a global acceleration program through a partnership with Cycle Momentum. "The program will offer support for start-ups at the Seed/Series A stage with cohorts across Europe, North America and Asia over three years". CIF's investment team was actively evaluating a rich pipeline of investment opportunities and welcomes inquiries and collaboration with entrepreneurs and co-investors.

About the Circular Innovation Fund

CIF is a global growth stage venture capital fund focused solely on circular innovation. It is a joint venture between leading cleantech capital managers – Montreal-based Cycle Capital and Paris-based Demeter. The fund invests in growth-stage companies from North America, Europe and Asia developing breakthrough new materials, circular packaging, recycling and waste innovations, logistics, as well as eco-efficient processes & design, and circular business models.

- www.circularinnovationfund.com
- www.cyclecapital.com
- www.demeter-im.com
- www.loreal.com

Photo: OpenClipart-Vectors / pixabay.com

Intended:

THE REGULATION OF EUROPEAN GREEN BOND STANDARD

Green bonds play an increasingly important role in financing assets needed for the low-carbon transition. However, there is no uniform green bond standard within the EU. The new European Green Bond Standard wants to ensure that European companies can benefit from green financing and that investors will find the green investments they wish.

Photo: Hans Braxmeier / pixabay.com

In May, the members of the European Parliament in the Economic and Monetary Affairs Committee adopted their negotiation position on the regulation of European green bonds. The text introduced numerous changes to the EU Commission's proposal and was approved by the majority of the committee. The proposal seeks to better regulate the entire green bond market, rather than only establishing the European Green Bond label (EuGB), and reduce so-called "green washing", a press release informed.

For all bonds marketed as green, transparency requirements are introduced, including being aligned with the taxonomy legislation on the use of proceeds derived from the bond issuance. According to the European Parliament, this would allow investors to compare EUGBs with other existing green bonds. "In addition, all those issuing green bonds must have safeguards in place to ensure they do not harm people or planet."

The proposal also requires that all EuGBs have verified transition plans. "The text also ensures that all issuers of green bonds have processes in place to identify and limit the principal adverse impacts of their activity." Furthermore, it prohibits all issuers from countries on the EU's grey- or black-list of tax havens from issuing EuGBs. As reported, supervision is strengthened in various ways. For example, provisions are included to ensure that the authorities could ban companies from issuing EUGBs if they fail to follow the rules. "The adopted text also ensures stronger market pressure to comply with the rules by ensuring investors have legal recourse if the issuer's failure to comply leads to the depreciation of a green bond," the Parliament wrote. Now, negotiations with the member states have to take place.

BIR World Recycling Convention & Exhibition:

SCRAP BECOMES INCREASINGLY IMPORTANT

According to the Bureau of International Recycling (BIR), the consumption of secondary material rose by 6.4 percent to 503.437 million tons. The steel scrap usage figures represent verified data for 79.7 percent of global steelmaking in 2021.

Every year on the occasion of the BIR World Recycling Convention in spring, Rolf Willeke, Statistics Advisor of the organization's Ferrous Division, presents the "World Steel Recycling in Figures" for a whole year. Despite the pandemic, 2021 witnessed a higher steel scrap usage in most countries and regions.

According to the statistics, global crude steel production totaled 1.952 billion tons in 2021, up 3.8 percent from the previous year. Global oxygen furnace production was almost unchanged at 1.381 billion tons whereas the electric furnace production intensified by 14.4 percent to 563 million tons, Rolf Willeke referred to worldsteel's information. There were also increases in the global production of both blast furnace iron (+1.2 percent to 1.346 billion tons) and DRI (+9.9 percent to 114.5 million tons).

As reported, China's crude steel production decreased in 2021 by three percent to 1.033 billion tons, reducing the country's share of global production from 56.6 percent in 2020 to 53 percent in 2021. In contrast, enhanced crude steel production was registered in 2021 by the EU-27 (+15.4 percent to 152.575 million tons), Japan (+15.8 percent to 96.334 million tons), the USA (+18 percent to 85.791 million tons), and Turkey (+12.7 percent to 40.360 million tons), to name but a few.

Higher steel scrap usage

According to the statistics compiled by Rolf Willeke and Daniela Entzian, the BIR Ferrous Division's Deputy Statistics Advisor, the steel scrap consumption in China (226.21 million tons) was 2.8 percent lower than in 2020, although the country remained the world's largest user.

Conversely, the EU-27 recorded a growth of 16.7 percent (to 87.853 million tons) in steel scrap consumption in 2021. The proportion of steel scrap used in the EU-27's crude steel production climbed to 57.6 percent in 2021.

The USA realized an increase in steel scrap usage of 18.3 percent to 59.4 million tons. The proportion of steel scrap used in US crude steel production improved to 69.2 percent. Steel scrap usage increased also in Turkey (+15.7 percent to 34.813 million tons); the utilization rate improved to 86.1 percent. The 2021 statistics revealed, too, an increase in Japan's steel scrap usage (+19 percent to 34.727 million tons).

Imports and Exports

Last year brought an 11.4 percent year-on-year increase in Turkey's overseas steel scrap purchases to 24.992 million tons, thus confirming the country as the world's foremost steel scrap importer, the statistics advisors informed. The EU-27 took over as the world's second-largest steel scrap importer in 2021 (+31.1 percent to 5.367 million tons). The world's third-largest steel scrap importer last year was the USA (+17.1 percent to 5.262 million tons). Global external steel scrap trade amounted to 109.6 million tons last year (+9.7 percent compared to 2020).

The EU-27 was the world's leading steel scrap exporter and intensified its outbound shipments by 11.5 percent to 19.460 million tons; the internal steel scrap exports in the EU countries totaled 29.328 million tons in 2021 (+14.5 percent compared to 2020). Last year also brought an increase in US overseas steel scrap shipments of 6.1 percent to 17.906 million tons. As reported, most of the world's leading steel scrap exporters are major net steel scrap exporters: last year's export surplus was, for example, 14.1 million tons for the EU-27 and 12.6 million tons for the USA.

Photo: O. Kürth

www.bir.org

RWANDA TO HOST THE WORLD CIRCULAR ECONOMY FORUM 2022

For the first time ever, this year's World Circular Economy Forum will take place in Africa. WCEF2022 will be organized jointly by the Republic of Rwanda, the African Circular Economy Alliance (ACEA) and The Finnish Innovation Fund Sitra, with international partners. The main event will be hosted by Rwanda, one of ACEA's founding members. The forum will explore major themes relevant to Africa's development, in which circularity could play a big role. The themes to address include climate and nature, youth, infrastructure, entrepreneurship and innovation, as well as trade and value chains. WCEF2022 will also present some of the world's best circular economy solutions, the organizers announced. It will examine how businesses from Africa and elsewhere can seize new opportunities and gain a competitive advantage in the transition to low-carbon and climate-resilient economies. The forum is expected to take place in Kigali in early October and online.

www.sitra.fi/en/projects/wcef/#events

USA:

NOVELIS BUILDS AN ADVANCED RECYCLING CENTER

The investment is to support North American automotive customers and reduce carbon emissions. International American aluminum company Novelis Inc. is building a "highly advanced recycling center" for automotive in Guthrie (Kentucky). With an annual casting capacity of 240,000 tons of sheet ingot, the facility (investment: 365 million US-Dollar) is expected to reduce the company's carbon emissions by more than one million tons each year, a press release said.

According to Novelis, the new recycling center is expected to be operational in 2024. It would be equipped with industry-leading processes and capabilities, including advanced shredding and sorting technology, "as well as energy-efficient innovations to support the company's sustainability goal to reduce energy intensity by 10 percent by 2026 and be net carbon neutral by 2050 or sooner".

www.novelis.com

GHANA: A WASTEWATER TREATMENT PLANT IN KUMASI

In 2019, the Hungarian Pureco-Unit Consortium started its first major investment on the African continent in Kumasi, Ghana. The facility, dedicated to the city's untreated wastewater, was designed and built under the name "Septopure technology". As reported by Pureco Group, the wastewater treatment plant put into operation last year is a "significant milestone for both the Hungarian and Ghanaian sides, as this is the country's first water industry development using Hungarian technology". The Hungarian-Ghanaian project, realized for one of Ghana's largest private enterprises, Jospong Group of Companies, was developed and implemented entirely on a bespoke basis, based on local needs.

"In addition to the technical design and implementation, it was important from the outset that the local colleagues were provided with all the necessary support they needed to run the system independently at a high standard," Pureco underlined. To this end, the Hungarian unit organized a training program for ten Ghanaian engineers held online due to the Covid-19 pandemic.

www.pureco.hu

THE UTILITY OF WASTE TO ENERGY

Globally there is an increased focus on renewable energy sources, replacing the existing coal-fired power plants with clean fuel power plants that can help reduce the carbon footprint.

Renewables Energy Industry comprises of non-thermal (such as Hydro, Solar Photovoltaic (PV) and Wind) and thermal energy sources (such as Bio-Power, Waste to Energy (WtE), Waste Heat, Concentrated Solar Thermal Power and Geothermal Power) Waste-to-energy (WtE) refers to a variety of treatment technologies that convert waste to electricity, heat, fuel or other usable materials, as well as a range of residues. There are several primary waste streams in urban areas. Municipal Solid Waste (MSW) is one of the primary waste streams that are disposed of in municipal landfills followed by Commercial and Industrial Waste (CIW).

Thermal WtE utilizes energy value in waste to generate electricity and/or heat. In Europe alone, WtE could prevent the production of up to 50 million tons of CO_2 emissions that would otherwise be generated by burning fossil fuels, published by MDPI, an international open access journal, in an article on sustainability.

Thermal treatment of waste is an environmentally acceptable alternative method. Thermal WtE, also known as incineration with energy recovery, is a major waste treatment method in some developed countries and by far the most widely adopted technology that dominates the global WtE market.

The Refuse Derived Fuel (RDF) based power production involves separating, sorting, drying and compressing the combustible portion of the waste, resulting in a product which can be used as a feedstock for any of the thermal processes, or combusted in an industrial application. Triveni Turbines installed its 1st Waste-to-Energy (WtE) steam turbine plant commissioned in Germany.

Given its energy intensive production operations, a German-based globally reputed paper manufactured reached out to Triveni Turbines for a refuse-derived fuel (RDF) based power plant.

Photos: Triveni Turbines

Solution

- Delivered 1*15.6 MWe extraction condensing steam turbine generator (STG) unit and auxiliaries
- The STG unit was designed for thermal energy use in paper drying process
- The STG unit was crafted to generate electrical energy to run the paper plant and to secure the energy needs of the neighbouring communities

Benefits

- The excess heat from the paper drying process is fed through a district heating pipeline to heat the outdoor swimming pool run by the municipality

Impact

(Through sourcing raw materials i.e. waste from neighbouring communities)

- 32 million cubic metres – saving of natural gas and primary energy
- 55,000 tons – reduction in CO_2 emission per year

Triveni Turbines provides steam turbine solutions that use low pressure steam generated through the extraction turbine for heating application by producing both heat and electric power (CHP). The cost of power generated through this process is 14-15 % lesser compared to the cost of power generated through Independent Power plants (IPPs) where the customer is benefited by generating only electric power.

Investments into Thermal renewable based power projects continue to be strong, with large orders finalized in Europe. For example, in the beginning of the year 2022, the company picked one of the largest orders from the globally reputed waste-to-energy producer based in France, for a 1*29.5 MW turbine, which is 20 kilometers from the Eiffel Tower, Paris.

Triveni Turbines Triveni plays a vital role in supplying steam turbines for the waste-to-energy based Independent Power Plants (IPPs) that work under continuous base load operations and varied grid conditions. The company have installed STGs for MSW based IPPs in India, Europe, Thailand, and South Korea.

Triveni Turbines continues its efforts to keep the planet clean and increase energy production by installing steam turbines. These turbines operate within MSW plants and help their main function of disposing of the municipal solid waste.

www.triveniturbines.com

SUCCESS FOR RUBICON

In 2021, US-based Rubicon – a digital marketplace for waste and recycling, and provider of software-based solutions for businesses and governments worldwide – achieved a revenue of 583 million US-Dollar.

In April this year, Rubicon Technologies LLC published the financial and operational results for the fiscal year 2021: Full-year GAAP (generally accepted accounting principles) revenue in 2021 was 583 million US-Dollar, eight percent higher than 2020 revenue. As reported, year-on-year growth was supported by expansions within the company's existing customer base and by new customer wins. The 2021 annualized recurring revenue (ARR) totaled 659 million US-Dollar as of December 31, 2021, and was 28 percent higher compared with the previous year. Annualized recurring net revenue totaled 58 million US-Dollar, an increase of 35 percent compared to 2020.

In December last year, Rubicon announced a business combination with founder SPAC, a publicly traded special purpose acquisition company. The combined company is expected to be listed on the New York Stock Exchange upon completion of the transaction, which – in April this year – was anticipated to occur in the second quarter of 2022 subject to approval by the founder's shareholders and other customary closing conditions. The company will continue to be based in Kentucky.

Recent business highlights of Rubicon include: In April, the firm announced a two-year, nationwide extension agreement with home goods retailer, Tuesday Morning. The agreement will cover the company's entire portfolio of nearly 500 locations in the United States as Rubicon seeks to continue to increase waste diversion from landfills, consolidate service, and provide enhanced account management across Tuesday Morning's portfolio of stores.

In March, the Kentucky-based business entered into a three-year smart city contract with the City of Houston (Texas) to improve residential waste and recycling services for the city's more than 2.3 million residents.

In February this year, Rubicon reported a multi-year agreement with SRS Distribution, Inc., one of the fastest-growing distributors of exterior building and outdoor living products in the United States, to provide scalable waste, recycling, and sustainability solutions in support of the company's environmental and business goals.

Also in February, the provider of software-based solutions informed that its pilot program with Japanese conglomerate, Odakyu Electric Railway Co., has successfully transitioned into a long-term, nationwide technology licensing agreement focused on supporting the Japanese waste and recycling industry as it moves towards a more integrated circular economy.

At the beginning of this year, Rubicon completed the acquisition of CIVIX LLC, a routing software and solutions company based in Germany. The acquisition expands and enhances the routing capabilities of the company's "RUBICONSmartCity" and "RUBICONPro" offerings, and helps drive its growth into additional international markets. As part of the acquisition, the President of CIVIX, Dr. Paul Patterson, and his team have joined the new owner.

www.rubicon.com

EY GLOBAL JOINS ALLIANCE TO END PLASTIC WASTE

Multinational professional services network Ernst & Young Global Limited, doing business as EY, has joined the Alliance to End Plastic Waste.

According to the UK-based company, EY experience across chemicals, manufacturing, supply chain and finance, would help the alliance – an industry-founded and funded non-governmental and non-profit organization based in Singapore – develop more effective environmental, social and governance (ESG) measurement criteria for its work on the ground, which will help it "to catalyze funding for alliance-led projects". Clear and consistent metrics would form the foundation of sustainable, commercially viable business models that can be scaled for greater impact. Along with its global network of members and partners, the Alliance to End Plastic Waste has built a portfolio of over 35 ongoing projects in 29 countries to support the transition to a circular economy for plastics. The focus is on testing and accelerating solutions to improve the collection, sorting, processing, and recycling of plastic waste – because three billion people worldwide still do not have access to proper waste management services. "EY work will contribute to developing innovative and self-sustaining infrastructure systems that can be owned and operated by the communities they benefit," the worldwide active network gave account. www.ey.com/en_gl

Access Management to Waste Bins:

GARBAGE COLLECTION UNDER CONTROL

According to Sensoneo, the provider of smart waste management technologies, the new solution ensures that only authorized citizens can use the bins and facilitates the implementation of Pay-as-you-throw (PAYT) within apartment houses and high-rise buildings.

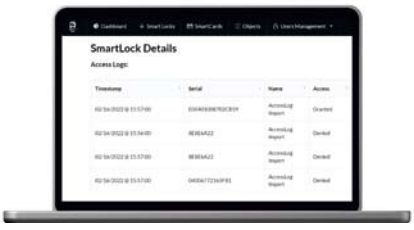
It is installed in the town of Dubnica, Slovakia. "Complaints about 'waste tourists' within housing estates areas who use the availability of containers to dump their waste have been very frequent. We want to make sure that our citizens pay only for the waste they generate. That is why we initiated proper recording and tracking of containers' usage," commented Mrs. Beniakova, the Head of Dubnica's environment department, where they successfully deployed the solution.

As stated by Slovak-based Sensoneo, public availability of waste bins does not always mean the bins are available for everyone. "However, fencing or locking bins in cages is not always an option – especially if the visual aspect is important for the customer. Sensoneo's Bin Access Management solution does not disturb the visual of the waste containers or their surroundings."

Control who accesses the waste containers

The new product uses a resilient yet subtle electronic lock mounted into the containers to secure the opening of the lid by scanning a digital key – chip or a card. "Chip/card accesses are allocated remotely via an online platform, where an authorized employee updates them in real-time. A household can gain access to multiple containers or stands with a single chip." The Bin Access Management solution would use NBIoT (Narrowband Internet of things) and/or Cat-M network (also known as LTE-M) for data transfer. In addition, it could easily be integrated via API (application programming interface) into current customers' systems. Otherwise, customers were welcome to use the solution's platform.

"The demand for a reliable solution for managing access to containers has been a very frequent request of our customers. Despite that we considered the market as sufficient in terms of the offer, the insights clearly proved there is an opportunity for an easy-to-deploy versatile solution that would answer the question of the gradual shutdown of the GPRS networks," Sensoneo's CEO Martin Basila reported. "The solution is primarily dedicated to (semi-) underground bins; however, it can be easily customized to other types of bins and containers thanks to a variable mounting kit."



Real-time overview of the access log

Besides access management, the online platform would also provide an overview of bins and stands openings. "As a result, the city has accurate information on how many times a particular household has opened the container within a selected period and obtains a reliable basis for the potential deployment of PAYT," the provider underlined. "Remote digital management of access to bins also represents a great opportunity for collection companies, especially if they manage recyclables and valuable commodities. Access to selected containers can be limited to selected drivers and workers. As the platform offers an instant online overview of who and when accessed bins, collection companies can prevent potential fraud and misuse."

www.sensoneo.com

Photos: Sensoneo

Recelerate:

JOINT VENTURE OF BOREALIS AND RECLAY GROUP

Formed of the waste management expertise of Reclay and the recycling capabilities of Borealis, Recelerate would grow from existing shared strengths across European markets, the two companies announced in a joint press release.

Austrian chemical company Borealis – an international provider of polyolefins, base chemicals, and fertilizers – and the German Reclay Group – an internationally oriented service provider in the field of extended producer responsibility (EPR) – have established a new, jointly-founded entity: Recelerate GmbH. The new organization's mission is to redesign the critical steps of the plastics sorting and recycling system for post-consumer lightweight packaging (LWP) to speed up circularity. The aim is to meet the rising market demand for high-quality recyclates for plastic applications.

"Recelerate will play a critical connector role in the plastic value chain, connecting downstream and upstream expertise to rethink how LWP waste is managed, sorted, processed, and recycled," the partners underlined. "The new entity will be powered by Reclay Group's strength in the area of extended producer responsibility schemes (EPR) and Borealis' focus on the growth of a more circular plastic model, powered in part by its proprietary recycling technology Borcycle." This combination would enable a macro view approach to identify opportunities to add value and invest where it matters to ensure more and more plastic waste from LWP can stay within the value chain. For Reclay, the joint venture would help grow the reach, scale and impact of EPR, and for Borealis, it would open up the supply of post-consumer plastic waste to be recycled with its recycling technology. Customers and consumers were also to benefit because this would mean greater access to high-quality recycled materials, the companies are convinced. "Recelerate will connect critical partners in the plastic value chain, closing the gap, and accelerating the growth and scaling of circular plastics."

Photo: Borealis

Announced the new joint venture: (from left to right): Christian Abl, Dr. Fritz Flanderka (Reclay), Lucrèce Foufopoulos (Borealis), Raffael A. Fruscio (Reclay) and Chris McArdle (Borealis)

www.borealisgroup.com
www.reclay-group.com/de/en/

FAURECIA AND VEOLIA INTEND TO USE RECYCLED PLASTICS IN AUTOMOTIVE INTERIORS

French automotive supplier Faurecia, a company of the Group FORVIA, and Veolia have signed a Cooperation and Research Agreement to jointly develop compounds for automotive interior modules, aiming to achieve an average of 30 percent of recycled content by 2025. In 2011, Faurecia introduced a range of bio-composite cockpit solutions with NAFILean. More than a decade later and in around 13 million vehicles, these products' CO_2 footprint was 28 percent lower than that of conventional all-plastic counterparts. In line with the group's CO_2 neutrality objectives, Faurecia created a cross-Business Group division for sustainable materials in 2021 to develop and manufacture "cutting-edge materials". This division aims to offer a complete low-CO_2 cockpit and even CO_2 negative materials, in order to support OEMs' sustainability objectives.

SLUDGE-TO-ENERGY PROJECT FOR AJMAN

Construction company BESIX Middle East has informed that its flagship Sludge-to-Energy project in the Emirate of Ajman (United Arab Emirates) has successfully passed performance and reliability tests.

Designed and built by BESIX Middle East for Ajman Sewerage (Private) Company Limited (ASPCL), the facility transforms sewage sludge into energy. "The facility, the first of its kind in the UAE, allows for the on-site production of green energy covering up to 50 percent of the electricity consumption of the ASPCL wastewater treatment plant in Al Jurf. The facility comprises two power generators with a combined capacity of 2.4 MW, which is equivalent to the energy consumption of 2,000 households in the United Arab Emirates."

Since 2002, ASPCL has played a central role in managing the wastewater of the Emirate of Ajman. The company currently purifies 120,000,000 liters of wastewater per day, equivalent to the daily sewage flow from Ajman.

Photo: BESIX

A circular, ecological and cost-saving solution

Sewage sludge is a residual organic by-product of biological wastewater treatment, which sewage treatment plants have historically disposed of in conventional landfills. The Ajman Sludge-to-Energy facility digests the sludge to produce biogas, which is then used to generate heat and electricity that is used in the wastewater treatment plant itself. This solution has environmental advantages. In addition to reducing the wastewater treatment plant's reliance on the public power grid and providing a circular solution, the digestion process allows for a significant reduction of the sludge quantities, whilst avoiding the uncontrolled fermentation of unstabilized sludge, which releases large quantities of greenhouse gases, generates odorous nuisance and poses a potential risk to public health. "In addition, the facility paves the way for further environmental upgrades such as the implementation of solar sludge drying and the use of Fat, Oil and Grease from restaurant grease traps to boost the facility's electricity production potential," the information said.

The Ajman Sludge-to-Energy facility is fully aligned with the UAE Federal Government's strategic environmental and energy objectives, in particular the UAE Green Agenda 2015-2030 and the UAE Net Zero program, a strategic initiative led by the Ministry of Climate Change and Environment to achieve net-zero emissions by 2050. The project complies with the relevant European safety regulations for biogas plants, and its emissions meet the stringent TA Luft standards, the German air pollution control regulation.

www.besix.com/en/

TECHNIP ENERGIES AND CLARIANT COOPERATE

In April this year, Technip Energies and Clariant announced that they have signed a cooperation agreement for the implementation of Clariant's sunliquid cellulosic ethanol technology. According to a press release, sunliquid customers "can benefit from combining Clariant's proven technology with Technip Energies' deep experience as an engineering, procurement and construction (EPC) contractor to build advanced biofuel plants". The process would convert agricultural residues, woody materials or municipal solid wastes into advanced biofuel. The cellulosic ethanol produced by the sunliquid process can be used as a drop-in solution for fuel blending and offers further downstream application opportunities for sustainable aviation fuels and bio-based chemicals, the information said. In addition, it can be further processed into green ethylene and ethylene derivatives, and other sugar-derived chemicals using other proprietary technologies offered by Technip Energies. End of 2021, Clariant completed the construction of its first full-scale commercial sunliquid cellulosic ethanol plant in Podari, Romania, which is currently started up and will be fully operational in 2022. The plant will process approximately 250,000 tons of straw to produce 50,000 tons of cellulosic ethanol per annum.

www.technipenergies.com
www.clariant.com/en
www.sunliquid.com

INNOVATIVE RECYCLING SOLUTIONS FROM URT UMWELT- UND RECYCLINGTECHNIK GMBH

For more than 10 years, the German plant manufacturer URT Umwelt- und Recyclingtechnik GmbH has been working successfully in the field of lithium-ion battery recycling. Due to many years of experience in the fields of inert shredding, airlock technology, plant sealing and efficient separation technology, the URT plants meet the latest European emission regulations as well as the highest recovery rates.

The German-based company has been focusing on electrical and electronic scrap (WEEE) recycling for over 25 years. In 2011, the company started to develop recycling solutions for battery recycling. At that time, URT was already part of the LithoRec-2 project when it designed and built the first prototype. Participating from the beginning, the company's first industrial plant is in operation since 2020. Currently, URT is building several plants in Europe and the USA. The next plant will be commissioned in Poland for Elemental Strategic Metals Sp. Z o.o.

The URT concept and its core elements

The URT recycling concept covers the core elements of resource recovery and pollutant removal in equal measure. The focus is on the one hand on the recovery of the black mass with a high degree of purity and on the other hand on the evaporation and separation of the electrolytes. The previously deep-discharged batteries are fed into a single-stage shredding process via a sluice system. Subsequently, the shredded total fraction enters a vacuum dryer, which evaporates the electrolytes, which are then condensed again and filled in liquid form. This process section, from shredding to dryer discharge, is encapsulated and kept inert by a nitrogen atmosphere.

The dry active material (black mass) is separated from the remaining components by sieving and filled. In order to meet recycling targets, the active mass must be almost completely separated. Ferrous metals are separated from non-ferrous metals by magnetic separation processes. Anode and cathode foils are further components of the batteries that are separated in the plant. The delamination is done by impact grinding of the foils to enable further separation of the metals coating, plastic foils and remaining active material. In addition to the maximum working conditions the plant will fulfil national and European emission standards. This is ensured by a multi-stage exhaust air treatment system consisting of gas scrubbing and exhaust air post-combustion. The URT lithium-ion battery recycling plant enables a recovery of more than 98 % of the black mass. Due to the one-step, slow-rotating shredding process before drying, less fines from the other fractions are carried over into the black mass. This produces a black mass of the highest purity.

Battery recycling remains strong in the future

Thanks to the proven concept, the plant manufacturer succeeds in closing the recycling loop as new batteries are produced from the obtained valuable materials. This solution is environmentally friendly and profitable for customers. Lithium-ion batteries are not only used in cars, but also in many other electronic applications, such as e-scooters and power tools. According to Frauenhoferinstitut, the volume of lithium-ion batteries and battery components to be recycled in Europe in 2040 is about 1,500 kilotons per year. With an export quota of over 90% and many years of know-how, URT as a reliable expert is equipped for the upcoming decades.

Many plant modules are developed in-house by URT. Besides the shredding in a nitrogen atmosphere, the various separation techniques are also part of these modules. Before developing the plant concept, URT carried out excessive tests with various batteries at the end of their service life as well as performance analyses and evaluations. The constantly new, individual concepts and the participation in various committees for the creation of standards in the industry enable the plant manufacturer to develop targeted and innovative recycling solutions.

www.urt-recycling.de

Photo: URT Umwelt- und Recyclingtechnik GmbH

MOL GROUP INVESTS IN RECYCLING AND WASTE MANAGEMENT ACTIVITIES

Hungarian multinational oil and gas company MOL Group has acquired ReMat Zrt., a recycler with production plants located in Hungary, and a logistics hub in Slovakia.

Photo: ReMat Zrt.

According to the new owner, ReMat is a market-leading plastics recycler in Hungary with an annual processing capacity of 25,000 tons and almost 200 employees. The company, using plastic waste from communal and industrial sources, would prepare a wide range of polyethylene and polypropylene regranules and tailor-made products. With this acquisition, MOL would be able to develop tailor-made virgin and recyclate solutions to fulfill the ever-increasing demand of its customers for circular materials. “The transaction fits into MOL’s portfolio and its goal to become a key player in the low carbon circular economy in Central and Eastern Europe,” MOL Group underlined, which – due to its “Shape Tomorrow” 2030+ Strategy – intends to spend one billion US-Dollar in the next five years on new circular economy and green projects. Waste integration and utilization is a key element of the new sustainable approach.

As reported, the MOL Group has implemented investments already and is “continuously seeking the opportunities to grow the share of recycled materials in its product portfolio”. In November 2019, the first step was taken with the acquisition of Aurora Kunststoffe GmbH, a recycled plastic-based compounder in Germany. “With a total combined annual capacity of 40,000 tons of Aurora and ReMat, MOL can offer a wide range of sustainable compounds and regranulates for the automotive and packaging industries.”

The Group also has established a strategic partnership with German company APK, “whose solvent-based process is capable of producing high-quality polymers from complex plastic waste”. Recently, too, it entered into a strategic partnership with Swiss Meraxis; the aim is to “forge ahead with the development and production of polyolefin re-compounds in the future”. Furthermore, MOL is planning investments in the field of chemical recycling as well and taking serious steps towards further waste-management activities.

www.molgroup.info/en

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- HIGH CAPACITY
- LOW WEAR COSTS
- EASY MAINTENANCE

ELDAN RECYCLING
www.eldan-recycling.com

K 2022: TREND REPORT ASIA

On the occasion of the international trade fair K 2022, exhibition corporation Messe Düsseldorf provided a report on the ASEAN region.

According to the Düsseldorf trade show corporation, the world has experienced economic disruptions in the last two years, owing in part to Covid-19 pandemic-related containment measures that hampered mobility and resulted in reduced spending and consumption of goods and services. “The situation has put the world‘s supply chain resilience to the test, as it has inevitably resulted in demand and supply shocks.”

To mitigate the economic impact of the pandemic, a diversification in supply and demand has occurred to make it easier to obtain essential raw materials and components, as well as faster distribution of finished goods and access to skilled labor markets or manufacturing facilities. Manufacturers worldwide have either localized or regionalized their production to reduce or even eliminate their dependence on sources that are perceived as risky. China, the world’s second-largest economy, is at the center of the global value chain, because of its large market, extensive supply chain, large and efficient ports, and transportation networks, the exhibition corporation gave account. China had been hampered by the Covid-19 outbreak, debts, and a property downturn. Its expansion was expected to reach eight percent in 2021 before slowing to 5.1 percent in 2022. “Nonetheless, as markets stabilize, it is expected that growth will resume by 2023.”

From this year, the country’s imports and exports have managed to recover with trading partners such as the Association of Southeast Asian Nations – ASEAN (19.7 percent), the European Union (19.1 percent), and the USA (20.2 percent), while commerce with East Asian peers, Japan and South Korea, increased 9.4 percent and 18.4 percent, respectively. For manufacturing companies operating in the global market, the “China Plus One” initiative (a business strategy, in which multinational firms – in addition to China – are moving to other countries), would provide an opportunity to tap into Southeast Asia’s advancing industrial infrastructure to improve supply chain resiliency.

Photos: Messe Düsseldorf, Constanze Tillmann

With the pandemic tapering off and more countries reopening, manufacturers would face new challenges such as high raw material and energy prices, logistical bottlenecks, and inflations, Messe Düsseldorf described the situation. At the same time, they were meeting consumers' low-cost demands and remaining consistent with technological advancements to readily reach economic viability. As well, digitalization would continue to play a vital part in keeping production, distribution efficiency, and closing the workforce gap.

Digitalization: 4IR and digital economy in ASEAN

The region of ASEAN, which includes Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, is a large market with a population of 661.9 million people. The expanding trading bloc is the world's fifth-largest economy with a total combined GDP (gross domestic product) of three trillion US-Dollar in 2020, after the USA with 20.9 trillion US-Dollar; China with 14.7 trillion US-Dollar; Japan with five trillion US-Dollar; and Germany with 3.8 trillion US-Dollar.

"The region has rallied behind the stringent containment measures and economic response during the pandemic. Trade has also been impacted by the pandemic, with imports and exports down eight percent in 2020 compared to the previous year." In order to usher in the post-pandemic economic recovery in 2022, the ASEAN would have to consider taking more bold steps toward manufacturing hubs, green infrastructure, digital investments, talent reskilling, and high-value food industries. "Given how digitalization has helped businesses continue operations, despite contactless transactions, adoption of digital technology has become a must." Most recently, Covid-19 had hastened the region's digital shift, "as digital technology has proven to be a critical driver of economic activity during the pandemic". To this end, the ASEAN Comprehensive Recovery Framework (ACRF), the region's whole-of-community exit strategy to Covid-19 (launched at the 37th ASEAN Summit in November 2020), has sped up its digital transition, as digital technology has proven to be a critical driver of economic activity during the pandemic.

"Enabling the Fourth Industrial Revolution (4IR) can boost ASEAN's competitiveness by increasing innovation, moving up value chains, creating jobs with better workforce capabilities and skills, lowering capital requirements, and increasing product customization," Messe Düsseldorf wrote. ASEAN's internet user base accounted for six percent of all internet users worldwide in 2010. In 2021, the number of internet users increased to 440 million, accounting for 75 percent of the region's population. This would include 40 million users who first connected to the internet in 2021.

ASEAN's digital consumers have also increased by 60 million from 350 million since the pandemic. Furthermore, the emphasis on advanced manufacturing and the service sectors of the new economy bodes well for the growth of its digital economy.

The digital economy in ASEAN's six largest markets – Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam – is estimated to reach 309 billion US-Dollar by 2025, up from 32 billion US-Dollar in 2015, and collectively, is expected to reach 1 trillion US-Dollar by 2030.

Circular economy: cradle-to-cradle sustainability

According to the World Economic Forum, over 92 billion tons of materials were extracted and processed in 2019, representing roughly half of global carbon emissions. Efforts to reduce global carbon emissions are obviously impeded by the linear take-make-dispose cycle. Enforcing a circular economy, which is restorative, regenerative by design, and makes effective use of materials and energy to retain their value by reducing waste and using natural resources sustainably, could lead to economic benefits worth up to 4.5 trillion US-Dollar by 2030.

New product manufacturing from virgin materials can produce 22.8 billion tons/year of emissions, Messe Düsseldorf informed. Circular economy strategies could nearly double the number of materials reused, from 8.6 percent to 17 percent, while limiting the use of virgin materials. "However, the circular economy has not been applied because the percentage of products and materials that are reused is decreasing, while CO_2 emissions from natural resource extraction and processing, which account for roughly half of all current GHG emissions, are increasing. By 2050, raw material demand is expected to double." ASEAN, which is still in its early stages of adopting the circular economy, is coming to grips with resource depletion, unsustainable raw material consumption, flaws in product value chains, and climate change, all of which are affecting the region's economic growth.

"Given how digitalization has helped businesses continue operations, despite contactless transactions, adoption of digital technology has become a must."

Furthermore, the region is plagued by the consequences of poor waste management. According to the United Nations' ASEAN waste management report in 2017, Indonesia generated 64 million tons of municipal solid waste (MSW). Thailand produced an estimated 26.8 million tons/year and Vietnam an estimated 22 million tons/year of waste.

Recycling: boosting value recovery of plastics

Less than 25 percent of plastics available for reuse were recycled into valuable materials in Malaysia, the Philippines, and Thailand, the trade fair organization referred to a World Bank report on Southeast Asia's plastic circularity. More than 75 percent of the material value of the plastics was lost, equating to six billion US-Dollar per year across the three countries, due to improper waste management and poor recycling of single-use plastics. "Malaysia, which is home to about 1,300 plastic manufacturers, has a low recycling rate, owing to its recycling industry's focus on materials like transparent PET bottles, which are easy to collect and have a high value. A vast bulk of waste, such as food packaging, polystyrene products and straws, go unrecycled due to lack of technology and unappealing profitability." Moreover, there was a lack of local demand for recycled plastic as global oil prices (which affect the prices of virgin plastics) have remained volatile. Recycled plastics had to be 15 to 30 percent cheaper than virgin resins in order to be competitive. "According to a World Bank country study that took into account the widely used and produced plastic resins, Malaysia loses 81 percent of the material value of PET, PP, HDPE, and LDPE plastics. These recyclable plastics are primarily used for single-use packaging." Meanwhile, PVC, which is also widely used in the country's building and construction industries, had longer application lifetimes of up to 20 years and was typically treated as construction and demolition (C&D) waste, and thus, handled better.

As reported, in response, Malaysia developed the country's "Roadmap Towards Zero Single-Use Plastics 2018-2030", a comprehensive policy framework to regulate the use of disposable plastics, and increase the uptake of biodegradable and compostable products including single-use medical devices and consumer products. It also contains a Federal pollution levy on plastic manufacturers, which was set to begin in 2022. Furthermore, more R&D funding would be directed toward the development of alternative eco-friendly products.

The Philippines is supposed to be responsible for an estimated 0.75 million tons/year of mismanaged plastics entering the ocean. However, the country is working to increase its plastic recycling rate, which is currently at 22 percent. With 78 percent of unrecovered material value, the country's economy loses approximately 790-890 million US-Dollar per year. In 2019, only 28 percent, or 292,000 tons of the 1.1 million tons/year of key resins consumed (including PET, PP, HDPE, and LLDPE/ LDPE) were recycled. PET (excluding polyester applications) has the highest recycling rate in packaging, at 45 percent.

Meanwhile, LDPE/LLDPE – used in a variety of applications such as electronics, automotive, and construction packaging sectors – are the least collected and recycled, since they have longer usage cycles, thus making collection difficult. On the other hand, the market for post-consumer plastics such as PET bottles has encouraged collection and recycling.

"To close this recycling gap, several obstacles must be overcome, including high logistics costs, which prevent recyclers from sourcing feedstock locally; energy costs, which are up to 67 percent higher than regional peers like Thailand and Vietnam, reducing profitability for most recyclers that use low-efficiency equipment," Messe Düsseldorf wrote. "Also on the agenda are the recycling mix, which contains a high proportion of low-value and difficult-to-recycle plastics, plus a lack of incentives to invest in more efficient recycling mechanisms and recyclers' inability to meet market demand for quality and scale; oil prices."

Thailand – which has a plastics industry that accounted for 6.1 percent of its GDP in 2019 – is focusing on plastic waste management as part of its efforts to strengthen trade. In 2018, it consumed 3.49 million tons of plastics/year (42 percent of this amount was used for packaging) and recycled only 17.6 percent to 616,000 tons/year of key plastic resins. According to the information, this practice resulted in an 87 percent material value loss amounting to around four billion US-Dollar per year. PET had the highest recycling rate (46 percent) of the resin types.

Thailand's "National Plastic Waste Management Roadmap 2018-2030" aims to recycle all plastics to boost material value recovery. "This can be accomplished by increasing the efficiency of post-consumer plastic waste collection and sorting, as well as mechanical and chemical recycling capacities; setting recycled content targets across all major end-use applications; mandating 'design for recycling' standards, and implementing waste management policies."

www.k-online.com/en

NEW PARTNERSHIP TO ADVANCE CIRCULARITY IN BATTERY RAW MATERIAL SUPPLY CHAINS

Li-Cycle and Glencore want to create an integrated network to supply primary and secondary lithium-ion battery materials.

According to the press releases of Switzerland-based Glencore International AG and Canadian Li-Cycle Holdings Corp., the strategic partnership will better serve the EV battery supply chain by providing customers with an integrated approach for their metal needs. The two companies have executed a global feedstock supply agreement under which Glencore will provide all types of manufacturing scrap and end-of-life lithium-ion batteries to Li-Cycle.

Li-Cycle (a leading lithium-ion battery recycler in North America) and Glencore (a leading provider of primary metals for the production of EV batteries) have also entered into a non-binding Term Sheet for global, long-term strategic contracts, which would complement Li-Cycle's existing off-take and marketing agreements, including:

- Supply of black mass to Li-Cycle's Hubs
- Off-take of black mass from Li-Cycle's Spokes
- Off-take of battery-grade end products produced by Li-Cycle's Hubs
- Off-take of by-products from Li-Cycle's Spokes and Hubs, and
- Supply of sulfuric acid, one of the key input reagents for Li-Cycle's Hubs

As reported, upon execution of the commercial agreements, Glencore will make a 200 million Dollar investment in the Canadian partner and will have the right to nominate one board member to the Li-Cycle board. "The commercial agreements are expected to be finalized and the financial investment is expected to close in the company's third fiscal quarter 2022," Li-Cycle gave account. With the addition of this strategic partnership with Li-Cycle, Glencore seeks to combine primary and recycled battery raw materials to produce battery-grade end products, the Swiss company informed. In Europe, the firm intends to assess the feasibility of utilizing its existing asset footprint "with a view towards re-purposing some of our assets. This will reduce the lead-time for achieving industrial-scale production of battery-grade end products".

Glencore would also explore, together with other appropriate supply chain partners, the production of precursor cathode active material (pCAM) in Europe and potentially North America.

www.glencore.com
www.li-cycle.com

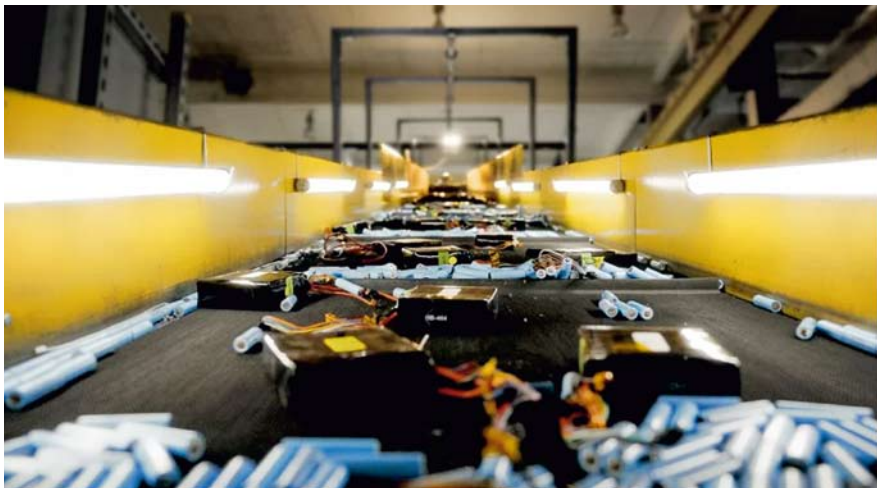

Photo: Li-Cycle

Vietnam: **ON THE WAY TO CIRCULAR ECONOMY**

Vietnam's revised Law on Environmental Protection (LEP), which came into effect in January this year, aims to reinforce the extended producer responsibility of manufacturers and importers through recycling.

Back in 2020, Vietnam was considered one of the five countries that generate most solid waste accounting for about 13 million tons per year, ReportLinker – a tech company that uses artificial intelligence to deliver market data and forecasts – informed in a press release relating to its waste management market within the period from 2020 to 2025. Some years earlier, in 2017, the Asian country was said to generate an amount of 38,000 tons of municipal waste per day. "The Vietnam Environment Administration found that the extent of municipal solid waste generation in the country increases by 10-16 percent every year," ReportLinker gave account.

At that time, about 85 percent of the waste generated in Vietnam was being buried without treatment in landfill sites, 80 percent of which were "unhygienic and pollute the environment". The national 3R (Reduce, Recycle, Reuse) campaign had gained momentum with wastes being dumped into the nearest landfills, ReportLinker wrote. "Majority of the companies in Vietnam's solid waste management industry are state-owned with the technologies provided by the foreign countries, few of them are large multinational companies and have subsidiaries in Vietnam. Most of the technology providers are from Singapore, China, USA and European countries. However, the adoption of technologies in the country is lower and is mainly fo-

Photo: Quyen Luong / pixabay.com

cused on the hardware products. The disadvantage created by the unclear legislation in the industry compels oneself to utilize foreign methods to tackle waste. Numerous waste to energy technologies are being encouraged by the government to utilize the waste and make useful resources for further use."

In 2020, there was also recycling in Vietnam. Hanoi had the highest recycling rate compared to other Asian cities with about 20 percent of the municipal waste recycled. "It's interesting to consider that the recycling activities are practiced at a household level as people attempt to sell or also give away recyclable metal cans or paper to iron dealers or waste-pickers," ReportLinker stated. The waste-pickers would play "a key role in the waste management system as they sort out waste at source, classify it and then sell it to recycling companies". Most of the recycling businesses in Vietnam were either informal family businesses or small-scale enterprises. "Recycling is considered an urgent requirement in the waste management in Vietnam as an effective option to reduce waste going into landfills. In Vietnam, the National Waste Management Strategy provides a detailed framework for building a circular economy focusing on the complete waste collection by 2025."

The national Law on Environmental Protection

In 2020, the existing Law on Environmental Protection (LEP) was revised. The online publication "Vietnam Briefing", produced by Dezan Shira & Associates in January this year, stresses the responsibilities of ministries and localities to integrate circular economy in planning strategies, development plans, waste management, and waste recycling.

"The 2020 LEP introduces the concept of circular economy through fostering extended producer responsibility (EPR) policy, highlighting the responsibility of producers and importers to recycle products and packaging. Following this, the government issued Article 54 and Article 55, which detail requirements on collection, disposal, and recycling of waste products, plastic waste, and others," the firm, which assists foreign investors throughout Asia, informed. The law would require that domestic solid wastes must be sorted into reusable or recyclable solid wastes, food wastes, and other solid domestic wastes. "Additionally, Article 54 provides that producers and importers of products and/or packages with recycling value are responsible for collecting them for post-use recycling at the obligatory recycling rates." As reported, this applies to both recyclable products, packaging, and waste treatment. Manufacturers can comply with the law via two options:

- organize the recycling themselves according to the given rates and specifications; or
- contribute financially to the Vietnam Environment Protection Fund (VEPF) to support the recycling of their waste.

Furthermore, Article 55 states that "organizations and individuals producing and/or importing packages, containing toxic substances, which are hardly recyclable or impede the collection and treatment, shall pay financial contributions to support daily-life solid waste treatment activities."

Benefits

According to Dezan Shira & Associates, the circular economy presents four benefits for businesses' sustainable development: resource efficiency, environment protection, eco-

Market Study for Vietnam: Plastics Circularity Opportunities and Barriers

In September last year, the World Bank published the "Market Study for Vietnam: Plastics Circularity Opportunities and Barriers". According to the information, plastics make a vital contribution to the Vietnamese economy. In 2019, the country's plastics industry had produced 8.89 million tons of products, and the industry contributed an estimated 17.5 billion US-Dollar to the national economy, representing 6.7 percent of GDP (gross domestic product).

However, mismanaged plastic waste has serious economic, environmental, and social consequences, the World Bank underlined on its homepage. "Asia is responsible for more than 80 percent of plastics leakages into marine environments, with eight out of the top 10 contributing countries from this region – with Vietnam ranking fourth globally, according to some estimates." In 2019, Vietnam recycled about 33 percent of key plastics resins. About 75 percent of the material value of the key plastics resins – approximately 2.2 billion to 2.9 billion US-Dollar per year – is lost in Vietnam when 2.62 million tons are disposed of annually rather than recycled into valuable materials, the organization gave account. The market study uses a plastics value chain approach to evaluate Vietnam's plastics recycling industry and its role in supporting a circular economy.

https://openknowledge.worldbank.org/handle/10986/36313

nomic development, and social benefits. "To comply with the law, Vietnam's manufacturers and producers will now have to register recycling plans and report recycling results annually to the Ministry of Natural Resources and Environment," the company underlined in January this year. "Local and foreign-invested companies are also advised to prepare recycling plans and budgets for EPR accordingly to address new requirements imposed by the new law."

However, transforming into a circular economy would require a rigorous regulatory framework that allows all economic sectors to apply the model in their production from manufacturing to consumption and waste management, the firm pointed out. "Therefore, to fasten the process, Vietnam should strengthen the cooperation of the government with business entities, facilitate effective partnership with the private sector while fostering trust among businesses. With increasing government policies and raising awareness of businesses and the community, Vietnam is set to become a competitive leader in pursuing sustainable economic development."

Recycling is considered an urgent requirement in the waste management in Vietnam as an effective option to reduce waste going into landfills.

Foreign investment in Vietnam

Vietnam has become an attractive destination for investors. "To encourage foreign investment, the Vietnamese Government has offered a wide range of investment and tax incentive schemes. For example, the new Law on Investment (LOI) introduced a preferential corporate tax rate of five percent for a maximum period of 37.5 years for large or specially encouraged investment projects," the Foreign Investment Agency (FIA Vietnam) stated on its website. "In addition, the Vietnamese Government has prioritized domestic infrastructure improvements and expanded the industrial real estate available to new developers." One of the preferred industries is the water sector – water supply and wastewater. According to FIA, the Vietnamese government "will give priority in using ODA funds to developing urban water drainage systems, especially in major cities and in areas that are prone to natural calamities. The Vietnamese government also encourages funding from both domestic and foreign individuals and institutions in developing water drainage and wastewater treatment systems". More Information: https://fia.mpi.gov.vn/en/Single/MenuID/6eb91552-3ae6-4c5b-920c-152d979cd658#

■ There is a guidebook available, which was prepared in a collaboration between Foreign Investment Agency of Vietnam and Ernst & Young Vietnam Limited to provide interested investors a basic understanding of Vietnam's investment climate; it can be downloaded at https://fia.mpi.gov.vn/en/Detail/CatID/3f434143-6484-4308-b3ef-073c676e8467/NewsID/7bfb3f05-3d86-459e-9630-4bc0a03f342c.

"No Time to Waste: The Challenges and Opportunities of Cleaner Trade for Vietnam"

The World Bank published another study on Vietnam: The Twenty-sixth United Nations Climate Change Conference (COP26) was held in early November 2021 in Glasgow, Scotland, at which Vietnam's Prime Minister, Phạm Minh Chính, pledged once again that Vietnam would be part of the global climate change solution. The country aims to increase the share of clean energy in its total primary energy supply to at least 20 percent by 2030 and 30 percent by 2045 and has pledged to phase out coal-fueled power generation and made a commitment to reach net-zero emissions by 2050.

Trade can be a central part of the solution to climate change Vietnam is experiencing and will have to deal with in years to come. Green trade or cleaner trade, trade in environmental or environmentally friendly goods can help Vietnam achieve not only its climate commitments but also its development ambition to become a high-income economy by 2045 as set out in the 2021–2030 Social Economic Development Strategy (SEDS). This edition of Taking Stock reviews the recent developments in the Vietnamese economy and discusses the economy's short- to medium-term prospects, highlighting domestic and external risks associated with the COVID-19 pandemic. The second part of the World Bank report elaborates on how Vietnam can harness the impacts of climate change on its trade sector, address challenges and take advantage of new opportunities.

https://openknowledge.worldbank.org/bitstream/handle/10986/36819/No-Time-to-Waste-The-Challenges-and-Opportunities-of-Cleaner-Trade-for-Vietnam.pdf?sequence=1&isAllowed=y

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RWANDA – FORERUNNER IN E-WASTE RECYCLING

"Rwanda has a bold vision to become a carbon-neutral and climate resilient economy by the middle of the century", Rwanda's National Fund for Environment prophesized in February 2022. Regarding circular economy or at least recycling, it will still be a long way to go.

There are no official data available on Rwanda's total waste production. But the United Nation Procurement Division estimates "more than 100 tons of waste every day" delivered to the landfill in Rwanda's capital Kigali – the only facility in the nation dealing with collected solid waste and featuring a recycling rate hovering somewhere between two and 12 percent. A country report launched by the European Union acts on the assumption of 193,434 tons of waste per year disposed of in Kigali; a benchmark study in 2019 indicated approximately 232,870 tons MSW generated. According to the Water and Sanitation Corporation, the amount of waste at the landfill sites of Kigali increased between 2006 and 2015 from 141.38 tons to 495.76 tons annually. And a study by Anirudh Rajashekar et al. published by the London School of Economic and Political Science – emanating from approximately 800 tons per day – foresees an increasing total waste generation between 2019 and 2030 at 300,000 to 475,000 tons per year, with managed urban waste doubling to 325,000 tons and rural waste climbing from nearly zero to about 50,000 tons.

First steps taken

A 10-year climate plan running from 2021 to 2030 includes the planning and investing of 28 million US-Dollar in extraction and utilization of gas landfills for power generation. Further eight million US-Dollar will be transferred in the establishment of waste-to-energy plants. In cooperation with Luxemburg, a three-year project called "Waste to Resources" was launched in August 2021 to implement an integrated sustainable waste recycling, waste control and hazardous waste management system in Kigali and later on nationwide. And a new recycling project started in Febru-

ary 2022 by distributing garbage bags to the population to support pre-sorting. With an investment of about 3.9 million US-Dollar, the transaction is expected to convert 70 percent of organic waste into fertilizer. As an NISR's Agricultural statistical survey indicates 55.7 percent of farmers using organic fertilizers, the EU report highlights the need of value-added strategies that transform organic waste into compost. This is as much necessary as the biggest share of municipal waste in Rwanda – 74 percent – comes from organics, mostly food waste and a quarter green waste.

First to ban plastic bags

Organics are not the only source of waste material problems: Already in 2004, ministerial instructions on the use and manufacturing of plastic bags with a thickness of 60 microns and below were adopted, although they showed little effect. However, in 2008, the country adopted prohibition of manufacturing, importation, use and sale of polythene bags and extended the law to ban all types of carrier/shopping plastic bags and plastics for wrapping successfully. In 2008 too, Ecoplastic, a plant dealing with recycling plastic bags, started and now denominates itself as one of Rwanda's leading companies in plastic recycling and the production of new plastic products. Rwanda became one of the first countries in the world to ban plastic bags. A tough legislation provides penalties for individual dumping plastics and for illegal acting companies. Therefore, plastics in 2019 delivered only three percent of the collected and disposed waste at the Kigali landfill. The local waste management and recycling company Coped Rwanda allocated 80,000 US-Dollar to setting waste collection centers. And planned to put roughly two millions in projects of turning plastic bottles into construction materials, into new standardized bottles or into the production of fibers for clothes. The local KT Press online balances that Rwanda now has a robust plastic recycling industry "positioning the country as a regional hub for turning trash into treasure". The drawback: From January until September 2021, Rwanda seized more than 11 million plastic bag smugglers.

First e-waste dismantling facility

Most e-waste in Africa comes from Australia, China, the EU, Japan, North America, South Korea, the US and Canada – waste that is predominately disposed through open

The Rwanda Green Fund

In 2012, the Government created the Rwanda Green Fund, locally known as FONERWA, as a financing vehicle to implement its climate action plan. The fund was designed as a cross-sectoral financing mechanism to mobilize financial and technical resources to achieve national goals and enable the country to meet its international obligations.

Since its inception, it "has played a central role in helping the country move towards achieving its vision of a green economy by facilitating direct access to international environment and climate finance as well as to streamline and rationalize external aid and domestic finance," FONERWA wrote in a blog post in February this year. To date, the fund had mobilized 217 million US-Dollar for green investments, and supported 46 green projects across the country, which contributed to the creation of more than 176,000 green jobs.

As reported, the fund works closely with different partners, both national and international, with the aim of attracting more funding for green investments. It "is ambitiously scaling up its global mobilization of climate finance to support sustainable initiatives in Rwanda by investing across several key sector priorities including climate-smart agriculture, green cities, biomass replacement, renewable energy, sustainable transport and waste".

To keep playing a greater catalytic role to the national's green agenda, the Rwanda Green Fund, in collaboration with other stakeholders, were in the process of diversifying financial instruments by establishing a Green Investment Facility to catalyze private investments in Rwanda. The facility "is being designed using the 'green bank' model with the main objective of addressing local market gaps and crowd in private finance using financial tools; strengthening Rwanda's ownership of climate finance by empowering the country to better access international finance (non-grant) resources as well as working in partnership with the local banks to build their green finance capacity through innovation, risk transfer and deal arrangement".

www.fonerwa.org

dumping, burning and landfilling, the Encanced Integrated Framework criticized in July 2020. But not so in Rwanda. Already in 2008, Rwanda started policy discussions around how to manage e-waste and approved an e-waste policy in 2016. More than that, in 2020 Rwanda launched its first e-waste dismantling and recycling facility, scheduled for the sustainable collection as well as for the treatment of end of life solar products and waste batteries, and operated and managed by EnviroServe Rwanda Green Park; its stakeholders are the ministries of Environment as well as of Trade and Industry, the Rwanda Environment Management Authority, the Rwanda Utilities Regulatory Authority, the Rwanda Green Fund (FONERWA) and the Rwanda Standards Board.

Importations prohibited

According to the Encanced Integrated Framework, this state-of-the-art plant run by EnviroServe can process up to 10,000 metric tons of e-waste annually. Until 2020, the company treated more than 4,000 tons and created over 600 jobs, Olivier Mbera, country general manager of EnviroServe, was cited. But he had to confess that the e-waste collecting coverage is just 30 percent by institutions and less than 10 percent by homes. And that the e-waste resources – representing approximately 66 million US-Dollar – need to be recovered and selected from hazardous materials, he told CNN. Besides that, the material's amount is expected to increase by 10,000 to 15,000 tons every year. The Rwanda government has already taken precautions: Together with its partner states Kenya, Uganda, Tanzania, Burundi and South Sudan it agreed unanimously to ban dumping of e-waste in the region especially by prohibiting the importation of cathode rays and standalone used computer monitors with effect from July 1, 2022.

Fiber from banana stalks

There is some metal recyclable at least in Rwanda's municipal solid waste: The EU country report reveals only 774 tons per year. But an article in The EastAfrican from November 2021 cites Richard Munang, UNEP's regional climate change co-ordinator for Africa. He declared that "the extraction of precious metals from dysfunctional e-waste in Africa is valued to be about 10 billion US-Dollar". Moreover, he underlined that – for example in Rwanda – up to 66 million US-Dollar worth of precious metals are recoverable from formal recycling. And "this is just the benefit from one plant."
Little is known of paper recycling. The before mentioned EU report speaks of five percent of the collected and disposed

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waste summing up to more than 10,400 tons per year. There is one paper treatment and recycling plant, Trust Industries, founded in 2009, that transforms paper waste into toilet paper. Comparable to plastic recyclers, the company receives materials from small industries, which are then separated, cleaned and combined with virgin materials to create new products for the market. In contrast, the start-up UMUTI uses fiber from left-over banana stalks and plantain trunks to produce paper as well as paper or paper packaging bags. In the textile sector only the UZURI K&Y enterprise is known, in its own words "preserving our environment through recycling of wastes" to tackle the United Nations' goal No 13 of climate action.

Business model proven effective

All in all, the Sage Journals backed by the International Solid Waste Association certified Kigali a "relatively high performance of waste collection" by comparison, although even this city as all other cities in East Africa needs to prioritize controlled waste treatment and disposal as well as increased quantity and the quality of recycling. Anyway: Rwanda declares and runs a National Environment and Climate Change Policy. Not for nothing, Rwanda 2016 belonged to the founding countries of the African Cicular EconomyAlliance (ACEA), built to transform Africa to a circular economy that delivers economic growth, jobs, and positive environmental outcomes. So obviously waste management has a key function in Rwanda's national policy. Not only because the designated mitigation measures in the waste sector constitute 14 percent of the potential for GHG emissions reduction, resulting in 54 percent from landfill gas utilization, 34 percent from waste-to-energy, and nine percent from aerobic composting. But also because – as the Global Green Growth Institute expressed it – "the business model of waste management has proven effective in treating waste as a valuable resource". So the "Vision 2050", edited by the Ministry of Finance and Economic Planning, prophesizes: "Through smart solid waste management, solid waste shall be collected, transported, treated and safely disposed. Industries will have regulated semi-centralized landfills or incinerators to treat liquid and solid waste respectively."

Lease fee to be reinvested

This will not function without private investment. Both sides seem to be disposed. Clare Akamanzsi, CEO of the Rwanda Development Board, is quoted: "The government of Rwanda is committed to working with the private sector to ensure sustainable development, which is critical for present and future generations." For implementation, the Rwanda Green Fund, FONERWA, was cross-sectoral designed to – amongst others – mobilize financial and technical resources, explore circular economy investment opportunities and support private as well as civil society initiatives aligned with the circular economy.

The system works. When the Rwanda E-Waste Dismantling and Recycling Facility opened, the operator EnviroServe Rwanda Green Park developed e-waste collection points and centers, introduced new machinery and equipment and payed the Government of Rwanda a total lease fee over the 10-year period "that will more than cover the initial investment in the project" (in the amount of 1.5 million US-Dollar). The lease fee paid to the Government of Rwanda was said to be reinvested into environmental and green growth initiatives through FONERWA.

WASTE MANAGEMENT MARKET TO GROW OVER THE NEXT FIVE YEARS

According to a new market research report published by MarketsandMarkets, the size of the international waste management market is expected to grow from an estimated 423.4 billion US-Dollar in 2021 to 542.7 billion US-Dollar by 2026. The key drivers for this global market include stringent regulations of governments worldwide for better management of waste and initiating environmental protection, the market research firm stated. In addition, a strong focus of several governments to conduct awareness programs underlines the importance of waste segregation and waste management. Last but not least technological advances and shortened life cycle of electronic products were increasing e-waste. As reported, the Asia Pacific region – segmented into countries like Japan, China, India, South Korea, Australia, and the rest of Asia Pacific (which majorly includes Malaysia, Singapore, Indonesia, and Thailand) – held the largest share of the waste management market in 2020. The shift of the Asia Pacific population from rural to urban areas is anticipated to result in a rapid increase in solid waste generation, MarketsandMarkets predicted. "The total population in the Asia Pacific is expected to reach 5.1 billion by 2050, out of which the urban population is projected to account for at least a 64.0 percent share."

www.marketsandmarkets.com

Mobile Network Equipment:

GSMA PRESENTED STRATEGY PAPER FOR CIRCULAR ECONOMY

The GSM Association (also referred to as 'the GSMA' or Global System for Mobile Communications) has published a strategy paper that analyzes how the network equipment used within the telecommunications system could evolve towards a circular business model.

The planet and its people need to reduce resource use and move to more sustainable business models, the industry organization representing the interests of more than 750 mobile network operators worldwide stated in its executive summary. That would also apply to the telecommunications industry and its network equipment. "With rapid technological changes and accompanying customer behaviors, lifecycles are shortened, resulting in greater production and increasing waste. While the industry is already practicing circular economy with mostly separate initiatives, this strategy paper outlines opportunities to create a global and unified vision for the whole ecosystem." That would encompass operators, suppliers, policymakers and civil society organizations.

In this regard, the authors of the paper have identified four challenges:

- "Reducing waste products, components and critical raw materials: Greater recycling of components and raw materials into remanufacturing processes is essential. Eco design principles as well as proper documentation and regulation to increase reliability are good first steps to lower the impact.
- Optimizing the sourcing, reusing and repurposing of existing network equipment: current market fragmentation has to be reduced to create a global second-hand market on a larger scale. Many barriers still exist, one of them being a lack of cooperation mode for value and revenue for all.
- Harmonizing the methods of evaluation to generate a common understanding: an integrated approach must be agreed upon with unified environmental metrics and recognized benchmark method for universal comparison.
- Redesigning the supply chain around the circular principles: to ensure full support and implementation, a new circular business model with a stronger business case needs to emerge. Contractual, regulatory and design barriers could be re-engineered to become incentives."

In the paper, the descriptions of these challenges are supplemented by case studies. Some examples concerning challenge one (reducing waste products, components and critical raw materials) outline some reuse and recycling initiatives, the information provided by the respective companies:

- The AT&T Global Supply Chain Investment Recovery (IR) group works with the company's contracted R2-certified vendors to recover and recycle network infrastructure assets. Materials are dismantled, sorted and baled by commodity in preparation for sale or recycling.
- In 2018-19, BT launched an initiative called R3X, which stands for Reuse, Recycle and Resale. This is a program that depowers and recovers redundant assets across its estate in collaboration with BT suppliers.
- MTN's circular economy program, named "Project Infinity", is one of the key drivers of the company's 2025 strategy and for achieving its net-zero by 2040 target. Since 2018, MTN has run a proof of concept and is currently operationalizing the program.
- OSCAR (Orange Sustainable and Circular Ambition for Recertification) is Orange's circular economy program, with the ultimate environmental aim to help reach net-zero carbon goals in 2040. By 2025, Orange targets that the majority of IT infrastructure, networks and data centers will operate with refurbished equipment at a large scale.
- During the process of network transformation from copper to optic fiber, a lot of equipment is being reused as spare parts for Telefónica's fixed network. In addition, Telefónica

Photo: Production Perig / stock.adobe.com

in Mexico is gradually dismantling an important part of their mobile network using a circular perspective view. Decommissioned network equipment is reused internally within their own operations inside Mexico or across Telefónica operations in other countries.
- All networks decommissioned by Telia are either reused internally or resold for reuse or recycling externally. Telia's network equipment re-use/resell program helps reduce both waste and costs, and also generates revenue.
- To support Vodafone's goal to reuse, resell or recycle 100 percent of their network waste, Vodafone Group launched Asset Marketplace, a business-to-business solution within Vodafone that allows the business to re-sell and repurpose large decommissioned electrical items like masts and antennae, helping to reduce carbon emissions and resource use by not needing to purchase new items. Since launching at the start of 2020, the company estimates that this has allowed for financial savings of more than 10 million Euro.

As underlined by GSMA, the strategy paper is intended to be the start of a discussion about the recommendations across the industry. "The next steps will be to agree a way forward and a timeline, and identifying how we can progress towards greater circularity."

www.gsma.com/betterfuture/wp-content/uploads/2022/02/Strategy-Paper-for-Circular-Economy-Network-Equipment.pdf

INDUSTRIAL RECYCLING SOLUTION FOR DETERGENT BOTTLES MADE OF HDPE

German company Pla.to Technology has presented a technology solution for the bottle-to-bottle recycling of detergent bottles made of high-density polyethylene (HDPE).

According to the company, it was able to reprocess – almost entirely – used shampoo and shower gel bottles without any loss of quality in a water-saving process at the Pla.to technical facility in Görlitz. "The rHDPE granulate obtained from bimodal high-density polyethylene was completely reintroduced into the production cycle, producing new detergent bottles solely from recycled granulate, that meet the quality standards of new products. With this, Pla.to offers the technology for a closed HDPE cycle – without the addition of virgin granulate necessary in other processes." The clients for this project were the German multinational company Beiersdorf AG and the Fraunhofer Institute for Process Engineering and Packaging.

The Recycling Process

Before recycling, the used bottles are first sorted by color with the caps and crushed using a granulator, the company described the process. "A dry cleaner then removes residual ingredients inside the bottles without any wastewater. Stubborn contaminants are first soaked and then removed from the plastic using friction and hot water. The label adhesive is then removed, and the material is mechanically and thermally dried. Finally, the air stream of the zig-zag separator separates the bottles and caps from label particles according to their bulk density. To separate the HDPE from the other components for reuse at the end, the polypropylene is separated using near-infrared spectroscopy (NIR). After compounding, it is regranulated into rHDPE and can be directly reused to produce new bottles."

With the help of a dry cleaner, contaminants such as paper labels and residual contents are defibered by high acceleration and impact forces. The system operates without wastewater

In the project, Pla.to produced 20,000 bottles through this method for recycling rHDPE, the company informed. "These bottles have passed all the necessary tests: They are dimensionally accurate, stable, odorless and have no imperfections such as specks or inclusions." Just like containers made from virgin material, they can be labeled and closed tightly with a newly applied PP cap.

About Pla.to Technology

Pla.to GmbH develops, manufactures and sells machines and systems for recycling plastics. The focus is on low-wastewater cleaning, washing and separation of waste material. Systems from Pla.to Technology are typically customized special machines. The company employs 14 people and is active globally, including the UK, the USA and the Czech Republic.

www.plato-technology.de/en/

Photo: Pla.to Technology

A NEW SOLUTION FOR PLASTIC RECYCLING

What has the plastic waste crisis taught us about recycling innovation? UK-based company Greenback Recycling Technologies Ltd. – in partnership with chemical recycling company Enval – presents a microwave-induced pyrolysis solution for dealing with low-density plastic waste. A specialist article by the company:

Photos: PHD Marketing Limited / Greenback Recycling Technologies

It is estimated that eight billion tons of plastic have been produced since the 1950s. Of that total figure, only 10 percent, at best, has ever been recycled. Plastic recycling has taken place for decades and there is no denying that mechanical recycling works well for rigid plastics such as PET and mono materials. Currently, however, most plastic waste still ends up being dumped, burned or sent to landfills. The reasons for this are manifold. Some plastic substrates are manufactured from multiple polymers – laminated or coextruded. This makes them difficult to recycle as the various materials cannot be easily separated and sent to the relevant waste channels. Other forms of plastic are too expensive to collect and sort so it is not economic to recycle them. This applies to most plastic films. Moreover, in the main, plastic contaminated with food cannot be recycled either.

As a result, plastic waste has become a runaway global problem and it is only set to get worse. According to the United Nations Environment Programme, the world produces three hundred million tons of plastic waste each year. In contrast, the world's plastic recycling capacity is estimated to be forty-six million tons a year according to the Organisation for Economic Co-operation and Development (OECD). Meanwhile, plastic production is projected to double by 2040. By the same year, the amount of plastic waste finding its way into the oceans is expected to triple to 29 million tons.

Reduce. Reuse. Recycle. Rethink

Across the world, think tanks and thought leaders, including scientists, academics and environmentalists, are united in agreement. The current approach to dealing with plastic waste simply is not working. The statistics show that it is a drastic problem and to address it requires radical thinking – and an equally radical solution. Any such solution must adopt a systems approach. Upstream, more needs to be done to reduce the production of virgin plastics and to ensure consumer packaged goods companies (CPGs) are supplied in packaging that is reusable or refillable.

Many individual nations and regional trade blocs have implemented legislation to encourage these changes in corporate behavior, but these fragmented efforts equate to local answers to a global issue. There is currently no worldwide regulator or treaty for the plastics industry and perhaps this needs to change. Downstream, there is a clear and present need to increase our recycling capabilities. Investment is key – but so too is innovation. Simply expanding our existing mechanical recycling infrastructure through large-scale plants may alleviate the problem but it certainly will not solve it. This is in part due to the cost and difficulties in recycling plastic waste as previously mentioned.

New technology and new methodologies must be developed to provide a much-needed boost to our current recycling activity. Greenback is proud to be at the forefront of leading efforts in this area.

New innovations. New possibilities

Working closely with UK-based chemical recycling company Enval, Greenback is helping to pioneer a unique microwave-induced pyrolysis solution for dealing with low-density plastic waste. This waste includes plastic aluminum laminates where aluminum foil is combined with plastic substrates. Thanks to its lightweight, flexible nature as well its ability to provide an effective barrier against light, moisture and gases such as oxygen, laminated flexible plastic packaging has been widely adopted by the world's major brands for application across consumer packaged goods (CPGs) ranging from food to cosmetics.

Flexible laminated plastic packaging enables manufacturers to reduce overall pack weight, transport costs and attributable vehicle emissions, not to mention the weight of packaging waste for disposal post-use. As a result, its use is increasing with more than 160,000 tons of this form of packaging entering the UK marketplace each year.

The process being realized by Greenback and Enval enables plastic aluminum laminates to be kept out of landfill and recycled in a way that is clean, efficient and economical. It transforms the material into oil feedstock (Py-Oil) which can be used to produce new plastic, effectively closing the loop on this waste. The aluminum is also recovered with a purity exceeding 98 percent enabling it to be re-smelted.

Physical and digital advances

Pyrolysis recycling can be further used to recycle post-consumer plastic waste, which would ordinarily be destined for landfill. The pyrolysis plants themselves are scalable and quick to commission. A single module can process 2.5kt (2,500 tons) per annum of hard-to-recycle plastic waste and can be neatly up-scaled in 2.5kt increments to fit the size of the waste stream available. As well as driving new developments in physical processes, innovation is helping to deliver new advances in digital technology, which can assist with the current waste crisis. Greenback's "eco2Veritas circularity platform" for example provides complete traceability across the plastic recycling process.

It helps to enhance the value of Py-Oil by giving CPG companies the reassurance that they are using recyclate that has come from legitimate sources where the provenance of the material is fully verified – from the point of collection to use. This provenance is particularly important when it

About Greenback Recycling Technologies

Greenback Recycling Technologies is a UK-headquartered company of over 40 people on a mission to solve the global plastic waste crisis. The company is "implementing a scalable and distributed advanced collection and recycling solution that offers brand owners and the plastics value chain fully traceable recyclate. We are building a decentralized network of collection and recycling plants near the sources of post-consumer plastic waste around the world. Through the use of smart contracts, we ensure a fair distribution of value to all actors in the supply chain including the informal waste collection sector." As reported, the company's certification technology uses blockchain-based evidence to trace and authenticate the provenance and composition of materials. This would enable waste plastic to be used as a feedstock for food-grade commercial packaging applications at predictable prices and in dependable quantities.

www.greenback.earth

comes to enabling recyclate to be used instead of virgin polymer in much needed food contact packaging applications. It also has the potential to be of significant benefit because of the twenty billion kilos of plastic currently used for packaging in Europe, almost 50 percent of it is employed by the food and drink industry.

In answer to the question, what has the plastic waste crisis taught us about recycling innovation? That it is an absolute necessity. It may not provide a silver bullet for the current situation facing the world. But it can, and is, making a significant difference.

VALMET TO SUPPLY FINNISH WASTEWATER TREATMENT PLANT WITH EQUIPMENT

Finnish machine-building concern Valmet will supply "automation and solids measurements" to the new regional central wastewater treatment plant, which is under construction in Tampere's Sulkavuori in Finland.

The construction of the plant started in 2018 as a joint project of several Finnish municipalities. As reported, the Sulkavuori facility will be commenced in 2025. The aim is to reduce the load placed on the discharge water system, even when the volume of treated water will increase.

With modern wastewater treatment solutions, the plant can stabilize the sludge, treat wastewater more efficiently and meet the environmental criteria also in the future, the globally active developer and supplier of process technologies, automation and services gave account. The order would be commissioned during 2025. Valmet's delivery will include "a Valmet DNA automation and information management system, Valmet Total Solids Measurements (Valmet TS), Valmet Low Solids Measurements (Valmet LS), and Valmet Dry Solids Measurements (Valmet DS)," the concern informed. Additionally, the order will cover field engineering and instrumentation, factory acceptance testing, automation system installation, commissioning, and training.

www.valmet.com

Photo: Valmet

The new wastewater treatment plant using the latest treatment technologies will be implemented in Tampere, Finland as a joint project of several municipalities

LITHUANIAN RESEARCHERS PROPOSE A METHOD FOR WIND TURBINE BLADES' RECYCLING

A group of researchers from Kaunas University of Technology (KTU) and the Lithuanian Energy Institute propose pyrolysis to recycle wind turbine blades.

Wind turbine blades made from glass fiber-reinforced polymer (GFRP) laminate composites can serve for up to 25 years. After that, they end up in landfills – GFRP is recognized as hard-to-break-down. This has become a real challenge for the renewable energy industry. It is estimated that wind turbine blades account for 10 percent of Europe's fiber-reinforced composite material waste. Researchers claim that by 2050, this blade waste will increase to around two million tons globally. With many countries banning composite materials from their landfills, recycling the used wind turbine blades becomes a challenge that researchers around the world are trying to solve.

Waste-free conversion

Due to its strength, shaping simplicity and low manufacturing costs GFRP composites are used for a multitude of purposes – for car manufacturing, maritime vessels, oil and gas production, construction, sporting goods and more. Aircraft, wind energy and electronics are among the industries, which use the GFRP most, with the global demand increasing annually by six percent.

"GFRP composites used for many industries including wind turbine blades manufacturing are either thermoset or thermoplastic. In either case, they roughly consist only of two components – fiber and resin (in some cases with different micro or nanoparticle additions). As for the fiber, it usually is carbon fiber or fiberglass (the latter is cheaper)," explains Dr. Samy Yousef, a

Dr. Samy Yousef

researcher at KTU, Faculty of Mechanical Engineering and Design.

During the experiments, the research group were applying pyrolysis (in presence of zeolite catalysts and without) to different batches of composites – fiberglass thermoset and fiberglass thermoplastic – measured the extraction of phenol (the primary component in the production of phenolic resins and the manufacture of nylon and other synthetic fibers) in each case. After that, they were analyzing the basic raw materials from each batch. The researchers also assessed the effect that the additive nanoparticles (such as carbon black) can have on the yield of useful components.

Wind turbines

Although the yield of the components extracted during pyrolysis differs depending on the temperatures applied, the proximate measurement revealed that in all the cases the numerous volatile compounds (up to 66 percent) and fiber residue (around 30 percent) were extracted. The added fiber nanoparticles (Carbon nanotubes and graphene) increased the yield of phenol. The phenol can be used for further production of resin, while the fiber residue can have numerous applications after purifying it chemically – for reinforced concrete, polymer composites, flooring. "Our method is virtually waste-free with some small emissions, which is standard in this kind of conversion operation," Yousef is quoted.

The experiments were conducted using the samples prepared at a laboratory that had compositions similar to those used for making wind turbine blades, and not the wind turbine blades themselves. Therefore, Dr. Yousef noted, there is a need to assess the effect of the paint coating, that the real turbine blades are covered with, to the results. However, he believes that it will not be significant. "We would of course be happy to receive a worn-out wind turbine blade, which is no longer usable, and to conduct our experiments with the samples obtained from the real object." Currently, the research group is creating a model, which would allow to scale and calculate the wider economic and environmental impact of the results.

www.en.ktu.edu

Photo: Kaunas University of Technology, Lithuania

Photo: Rabih Shasha, UNSPLASH

WASTEWATER TREATMENT PLANT ON CORK FLOATING ISLANDS

In Lourosa, S. Pedro do Sul, Portugal, a different and innovative WWTP – Wastewater Treatment Plant – started operating, having floating plants on cork.

According to Nuno Gomes, mentor of the project, which was developed by the Portuguese company Bluemater in collaboration with Amorim Cork Composites, the facility is "the first WWTP in the world built with this system." As emphasized, it will serve the local population, that is, around 200 inhabitants.

Another added value of this system is that it will be more aesthetically pleasing to the eye, since plant species will grow on its surface. "In this WWTP, the plant species to be included are rushes and reeds", and "it is also expected that other species will emerge from seeds and that the surface of the water will be covered with duckweed", Nuno Gomes explained.

www.bluemater.com

Photos: Bluemater

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RECYCLING SYSTEMS
forrec.eu
SHREDDER AND SYSTEMS FOR WASTE RECYCLING

Recirculation with AI:

A SECOND LIFE FOR VEHICLE COMPONENTS

Artificial intelligence (AI) plays a central role in the German "EIBA" project.

A huge number of used parts end up in the scrapyard for recycling every year. According to the Berlin-based Fraunhofer Institute for Production Systems and Design Technology IPK, it is more resource-efficient to remanufacture alternators, starters and the like as part of a recirculation approach. This would reduce waste, lower the CO_2 footprint and extend the service life of products.

In the "EIBA" project, the Fraunhofer IPK is developing an AI-based assistance system for semi-automated image-based identification of used parts without QR or bar codes. "This will assist the worker with the sorting process so that more used components can be sent for remanufacturing." As stated, remanufacturing – the process of rebuilding used equipment to reflect its original condition – may become a key element of the circular economy.

AI-supported assistance system for semi-automated sorting of used components

Four-eyes principle reduces error rate

Identifying and assessing vehicle components is one key challenge in the remanufacturing process. "Many products are virtually indistinguishable from one another and are difficult to identify due to dirt and wear. Up to now, this task has been carried out manually by specialists under considerable time pressure," the research institute wrote. Fraunhofer IPK's AI-based assistance system would help employees to identify and assess defective wear parts such as starters, air-conditioning compressors and alternators based on the four-eye principle.

Identification features such as weight, volume, shape, size and color characteristics are used, but customer and delivery data are also included in the evaluation. The employee, on the other hand, spots any loose components or burnt parts, which is where the AI system's image processing function comes up short.

The "EIBA" Project

The transition to a circular economy, the re-use of products, requires an efficient collection and identification of used products. What do they consist of? What is usable? Every product is unique due to its history – and it is often similar to its successors. To facilitate identification, an artificial intelligence (AI) supports the identification of the product in the "EIBA" project. It is funded by the German Federal Ministry of Education and Research (BMBF); project partners are Circular Economy Solutions GmbH, Technische Universität Berlin, the National Academy of Science and Engineering acatech and the Fraunhofer Institute for Production Systems and Design Technology IPK.

The aim of the "EIBA" project – which will end in August this year – is to develop a system for the identification and condition assessment of used parts. This will make an important contribution to closing the cycle through digital technologies, the project homepage informs. By using methods of artificial intelligence – such as machine learning as well as deep learning – the system should be able to identify products and compare them with other available information. "By continuously expanding the data, it should also be able to adapt to new products and requirements."

www.innovative-produktkreislaeufe.de/en/Projects/EIBA.html

Product variance – two generators with different part numbers are visually identical

Photos: Fraunhofer IPK/Larissa Klassen

The identification process

At first, the used part undergoes image-based processing, Fraunhofer IPK describes the necessary steps. This would involve the system scanning the packaging to gather information about the product group. By breaking this process down into subtasks, the search range for identification is reduced from 1:120,000 to 1:5,000. The used part is then weighed and recorded by 3D stereo cameras.

As reported, the results obtained from the image-based processing stage

Condition variance – two starters with identical part numbers differ in appearance due to wear marks

are combined with the analysis of the part-specific commercial data, such as the origin, date and location, in order to identify the part reliably. The information is processed by two AI systems simultaneously. “The results of the image-based processing stage are merged with the analysis of the part-specific commercial data, such as the origin, date and location, so that the used part is identified in a reliable and comprehensive manner,” the research institute underlined. Then the outcome of the identification process is shown to the employee, who receives a suggestion list with a preview image and part number, thus retaining full control.

www.fraunhofer.de/en

REAL-TIME DATA VISUALIZATION TO CREATE NEW VALUE

“STEINERT.view” is a monitoring solution for sensor-based sorting machines made by German manufacturer Steinert. The monitoring solution gives users insight into the availability and output of individual machines, allowing them to learn more about the condition of their applications or sorting facility, the firm explained its advantages. “For the first time ever, this detailed machine data is accessible at any time and from any location.”

Designed as a mobile-first app, “STEINERT.view” would provide users with a quick overview of the key performance and output data on the move. At the same time, complex process technologies could also be visualized. “Filter functions mean that users never lose track of things and can easily identify areas where problems are arising or potential lies untapped.” As underlined, the monitoring solution can also assist with improvements to sorting performance. Changing the grain size and material distribution can influence the product unit. “Comparing nominal and actual values in a graph reveals where action needs to be taken right away. In this way, the data can be used to visualize the effectiveness of measures so that the user can get close to a machine’s optimum operating point,” the expert for raw materials production and recycling pointed out.

According to the engineering company, “STEINERT.view” resulted from working in close collaboration with customers and extensive testing. The system is available as an app for all common screen sizes on the Apple App Store and Google Play Store for all new sensor-sorting units from Steinert. “Upgrades are available for machines constructed in 2018 and later.” The solution for sensor-based sorting machines is an IoT platform based on international standards. “The transmission of data is always secured via TLS using the MQTT protocol and data-at-rest is 256-bit AES encrypted, using Microsoft Azure as the cloud service provider,” the company assured. In addition, it had been designed “in such a way that it is not possible to influence production or occupational safety on-site and potential cyberattacks come to nothing”.

www.steinertglobal.com

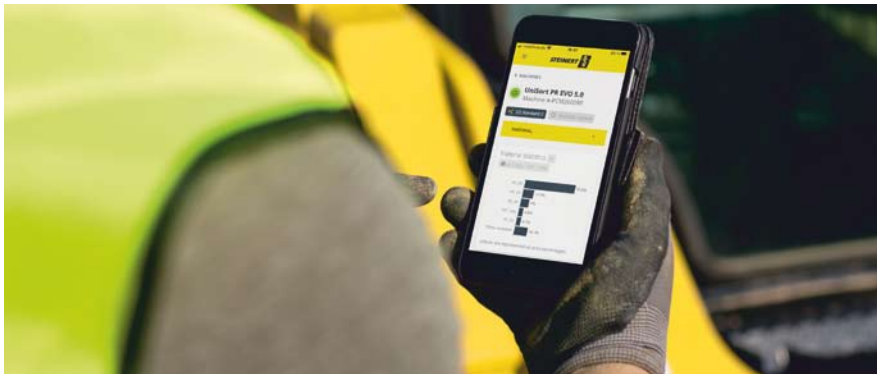

Photo: Steinert GmbH

NEW NEXT GENERATION OF COMPACT WHEEL LOADERS

Caterpillar offers the new Next Generation Cat 906, 907, and 908 wheel loaders. The machines "boast a reengineered operator's station, leveraging exclusive Cat technologies to improve operator experience and provide larger wheel loader model comfort on a smaller platform," the supplier assured. "The hydraulics and structures have gone through an overhaul, making these new models an optimal fit for many applications."

To meet the demand for increased multifunctionality with lift and tilt while powering hydromechanical tools, these wheel loaders feature "a new standard pressure compensated valve, allowing operators to simultaneously control implements and operate hydromechanical attachments seamlessly". Increased working auxiliary pressures would make work easier and improve steering to reduce operator fatigue.

The Cat 908 compact wheel loader

"New for this class size, an optional Cat 908 high-lift configuration is available, perfect for customers operating in agricultural and industrial and waste markets," Caterpillar underlined. "When combined with the reversing fan option, the high-lift configuration offers farmers increased operating efficiency and reliability. Available solid tires and the high lift configuration make the new 908 loader ideal for industrial and waste applications." Specifically designed for Cat products, the new Cat C2.8 engine would deliver the same 55.7-kW (74-hp) gross power as the previous engine with 13 percent more torque, resulting in roading performance and tractive effort improvements, the manufacturer pointed out.

www.cat.com

Photo: Caterpillar

TANA PRESENTED NEW MACHINES AT IFAT

Finnish machine producer Tana has expanded its product range with a new shredder model and a completely new type of disc screen.

The new mobile waste shredder named "TANA 220DTeco" is mechanically similar to the "TANA 440 Shark" shredder, except it is powered by a single hydraulic motor. The machine, launched at IFAT, is capable of handling municipal solid waste, construction and demolition waste, wood waste and solid recovered fuel, the company informed. More challenging waste types, such as tires, could be shredded by the larger TANA 440 Shark. "The TANA 220DTeco can process waste at the same speed as its big brother but with half the torque. Both models share the same wearing parts. The new shredder comes with tracks and is powered by a Stage V compliant engine."

New in the model range of the Finnish manufacturer is also the "TANA X553T" disc screen. "A special feature of our disc screen is its modular screening table, which makes it possible to adjust it to the desired particle size in just 15 minutes. This also facilitates servicing," the company's Product Manager Eetu Tuovinen was quoted. As reported, the standard-equipped

The "TANA X553T" disc screen

Photo: Tana

machine can screen material into two different fractions. “A third conveyor is available as an option, making it possible to screen material into three different fractions. For example, the first quarter of the screening table can be used to screen fine materials smaller than 20 millimeters, while the following three quarters can be used to screen medium-sized fractions between 20 and 100 millimeters. Any larger materials become excess.” According to Tana, the new shredder and disc screen form an ideal machine chain, “as they can process the same waste types at the same speed. The disc screen also has a large hopper that makes it possible to feed the machine with a wheeled loader.” Furthermore, Tana’s “ProTrack” remote monitoring system has been expanded to create the “TanaConnect” portal, which includes many new features. It can be used on any device connected to the Internet, such as a smartphone or desktop computer. The new remote monitoring capabilities, which are already in use at the factory and dealers, will also be available to customers this year, the machine manufacturer announced.

www.tana.fi

ACE GREEN RECYCLING TO BUILD BATTERY RECYCLING PARK IN TEXAS

Recycling technology company, ACE Green Recycling (ACE) has announced its plans to build and operate North America‘s “largest emission-free and sustainable battery recycling park” in Texas, USA.

The facility will be able to recycle both lead-acid and lithium-ion batteries when fully operational, the company informed in a press release. It is expected to start its first phase of operations in the third quarter of 2023, “starting with the recycling of lead-acid batteries using ACE‘s proprietary emission-free battery recycling technology and followed with a lithium-ion battery recycling facility in proximity”. When operating at full capacity, ACE expects the facility to process and recycle up to 100,000 metric tons of used lead-acid batteries and 20,000 metric tons of used lithium-ion batteries annually by 2025.

“Traditionally, battery recycling is via the smelting process which involves operating at extremely high temperatures – often more than 1,000 °C – with the burning of expensive and polluting fossil fuels, producing significant greenhouse gases (GHG), and exposing workers to hazardous working conditions,” ACE Green Recycling stated. “Compared to smelting, ACE‘s proprietary technologies for both lead-acid and lithium-ion battery recycling are fully electrified with zero carbon emissions and provide higher battery material yields while providing a safer workplace environment.

ACE is also exploring opportunities for operating most of its key plant activities with solar energy to reduce the facility‘s Scope 2 emissions.” As reported, the company had already deployed its technology on a commercial scale and is set to announce new facilities in Asia, Europe, and the Middle East by early 2023. Recently ACE announced a deal with Pondy Oxides & Chemicals Ltd, a leading recycler in India.

www.acegreenrecycling.com

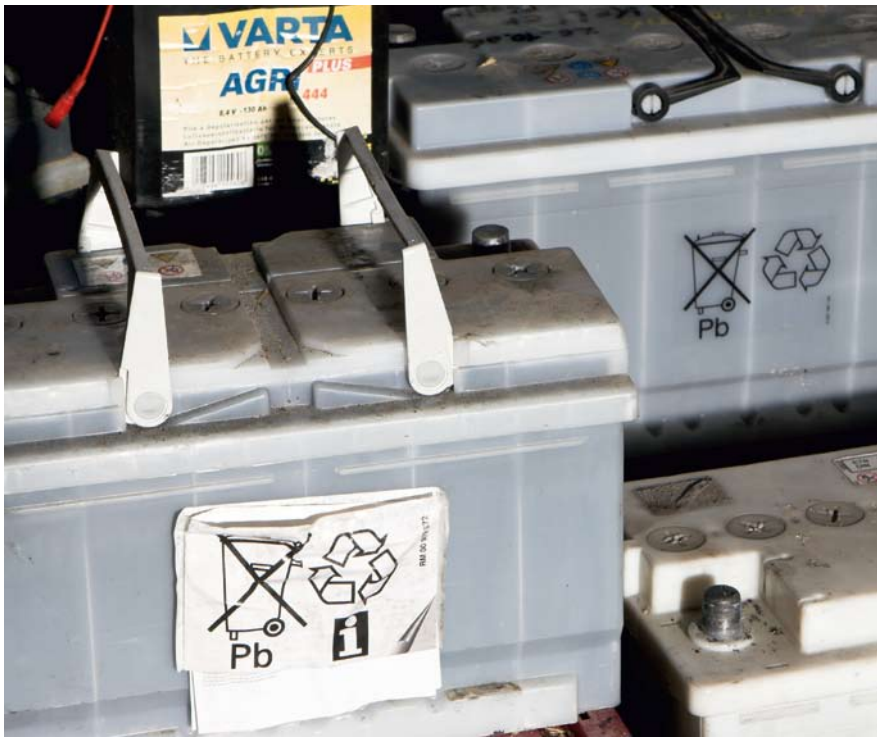

Photo: Marc Weigert

BHS-SONTHOFEN CONTRIBUTED TO BIOMASS PROJECTS IN THE PHILIPPINES

USA-based Dole Inc. generates large amounts of pineapple waste, which the company uses to produce biogas in the Philippines.

Dole is looking to generate nearly eight MW of power per year at the two plants, Surallah and Polomolok, German company BHS-Sonthofen reported this year. To achieve this goal, the plants deploy Biogrinders from BHS to efficiently process substrate.

The Biogrinders for the Surallah and Polomolok facility were supplied by MEBA Biogas, the exclusive distribution partner of BHS-Sonthofen

Pineapple waste has a high-energy content. "To facilitate the uptake of nutrients from the waste by the micro-organisms in the fermenters, it must first be defibered to achieve reliable, efficient gas production," the firm specialized in machinery and plant engineering explained. "Defibering und crushing technology from BHS-Sonthofen plays a key role in this step. MEBA Biogas, which is the exclusive distribution partner of BHS-Sonthofen and also supplies feed-in and processing systems for Dole's biogas plants in the Philippines, installed the first of two Biogrinders in 2021. The RBG 08 Biogrinder, including the screw unit and control system, went into operation at the production facility in Surallah in August 2021, where it has been used to defiber pineapple waste ever since." This machine was able to process up to 40 metric tons of waste an hour, while also delivering maximum energy efficiency. "The contaminant-resistant Biogrinder can be fitted with two, three, or four hammers on each level. In Hardox or stainless-steel models, this can be done on up to two levels. As an added plus, tool changes and upgrades can be carried out in just a few steps."

The second Dole biogas plant at the Polomolok facility in the Philippines was expected to go online in 2022, BHS-Sonthofen referred to Met-Power Venture Partner's estimates. Metpower is a waste management, industrial gases, and bioenergy subsidiary of Metro Pacific Investments Corporation (MPIC) and has an exclusive partnership for biogas tanks in the Philippines with Lipp GmbH, a Germany-based tank construction specialist with over 55 years of experience utilizing anaerobic digestion to produce biogas.

Pineapple waste is the main raw material for local biogas production

As stated by MPIC, a Philippine-based, publicly-listed investment management and holding company, it views this business as a long-term solution for food and agricultural companies, industrial facilities, cities, and municipalities to address their organic waste management issues. In addition to this, Metpower was also able to produce clean energy and organic fertilizer as by-products.

www.bhs-sonthofen.com/en
www.mpic.com.ph

Photos: BHS-Sonthofen

TURMEC TO UPGRADE RECYCLING FACILITY IN SCOTLAND

Irish waste processing and recycling solutions provider Turmec will support Scottish recycling and waste management business Levenseat Ltd to double the waste sorting capacity at its site at Falkirk.

As reported by Turmec, the international provider of waste processing and recycling solutions has been awarded a contract worth 4.2 million British Pound (converted to about 5.1 million US-Dollar). The company is commissioned to upgrade a materials recycling facility (MRF) at Falkirk in Scotland. The facility was purchased from Avondale Environmental by West Lothian recycling and waste management business, Levenseat. The upgrade program is intended to realize a plant designed to process up to 200,000 tons of waste per year, which will almost double Levenseat's current sorting line capacity. "The introduction of new technologies and automated processes will upskill the labor input on the line," Turmec gave account. "The new facility will continue to accept waste from its existing customers and will enable Levenseat to expand its public and private sector business across central Scotland." Improvements to the upgraded MRF would allow it to process and recover a much wider range of materials, including bulky waste, which has traditionally been difficult to recycle. The Falkirk site also processes mixed household, commercial, industrial, construction and demolition waste. Through its industry experience and investment in the facility, Levenseat says it will introduce new, innovative processes to ensure more of this waste stream is recovered for recycling with remaining un-recyclable materials converted into fuel.

www.levenseat.co.uk
www.turmec.com

SUSTAINABLE PROTECTIVE CASES FOR NEW SAMSUNG GALAXY

US-based company Incipio, a designer and manufacturer of mobile device accessories and technologies, has announced protective case solutions containing recycling material for the Samsung Galaxy Z Fold3 and Galaxy Z Flip3 devices. As reported, the grip cases have been certified to meet Samsung performance standards through the Samsung Mobile Accessory Partnership Program (SMAPP). The material is BPA-free and "includes Eastman Tritan Renew copolyester, a durable material with 50 percent ISCC-certified recycled content*), making it a more sustainable option for consumers. Tritan Renew is made through "innovative molecular recycling technology", which breaks down plastic waste into fundamental building blocks to be used to create pristine new material".

*) The recycled content is achieved by allocating the recycled waste plastic using a mass balance process certified by ISCC.

www.incipio.com
www.eastman.com/Brands/Eastman_Tritan/Pages/tritan-renew.aspx

Photo: Incipio

AUSTRALASIAN WASTE & RECYCLING EXPO

August 24 – 25, 2022, Sydney (Australia)

The Australasian Waste & Recycling Expo (AWRE) is a two-day live experience promoting ideas and opportunities for Australia's waste and recycling community, the organizers of the event underline. "At a vital time in the industry, AWRE offers new connections, solutions and strategies to build a more stable, sustainable and profitable economy." AWRE will be hosting a summit for high-level collaboration between industry, government and waste generators – hosted by National Waste and Recycling Industry Council (NWRIC), Waste Contractors and Recyclers Association of NSW (WCRA) and New South Wales Environment Protection Authority (NSW EPA). According to the information, the event's networking dinner will be an ideal forum to get into contact with dignitaries and reconnect with the waste, recycling and resource-recovery sector. Furthermore, an awards ceremony would acknowledge new and emerging innovations currently transforming the industry.

www.awre.com.au

RAW EXPO AFRICA

November 16 – 18, 2022, Lagos (Nigeria)

The fast-developing communities in Africa need suitable technologies for environmental management. The trade fair RAW Expo Africa – organized by the publishing and events companies Media Fusion and ISSA Pulire Network – is expected to meet that demand by bringing local, regional and international exhibitors face-to-face with buyers, distributors, service providers and government entities from across Africa's fast developing waste and recycling sector. Furthermore, the inaugural edition of this trade fair will have an exclusive conference dedicated to the recycling and waste management industries to enable knowledge exchange. "It will explore and promote sustainable waste and recycling solutions across the African continent," the organizers underlined. The three-day event would cover topics including waste collection, waste disposal, waste treatment, recycling, environmental services and technologies. RAW Expo Africa will take place at Landmark Centre, Lagos, Nigeria, and is strategically integrated with ISSA Pulire Clean Africa show, the first exhibition in Nigeria dedicated to the professional cleaning and hygiene sectors.

www.rawafricaexpo.com

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