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GLOBAL RECYCLING

*The Magazine for
Business Opportunities
& International Markets*



Turkey: Huge Market
Potential, Page 12

Raw Material Imports
Reflect the Economic
Situation, Page 15

Russia: There Will Be
a Change, Page 24

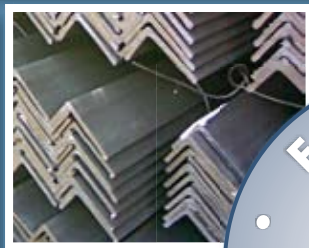
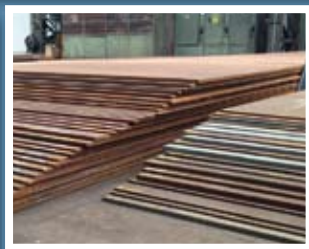
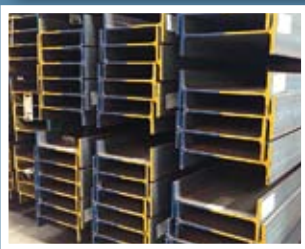
Cuba: Slowly Requested
by Foreign Investors,
Page 27

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Publisher:MSV Mediaservice & Verlag GmbH
Responsible for the Content:
Oliver Kürth**Editors:**Brigitte Weber (Editor-in-Chief)
Tel.: +49 (0) 26 43 / 68 39
E-Mail: weber@msvgmbh.eu

Dr. Jürgen Kroll

Tel.: +49 (0) 51 51 / 86 92
E-Mail: kroll@msvgmbh.eu**Advertising Sales:**Marco Notheis
Tel.: +49 (0) 81 41 / 53 00 19
E-Mail: notheis@msvgmbh.eu

Julia Huß

Tel.: +49 (0) 81 41 / 22 44 13
E-Mail: huss@msvgmbh.euAdvertisement Price List No. 2
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GERMANYTel.: +49 (0) 81 41 / 53 00 20
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E-Mail: msvgmbh@t-online.dewww.eu-recycling.com
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Recycling is Worthwhile

In October, the financial software, data and media company Bloomberg reported, that – based on estimates – about 61.8 million US-Dollar of loose change is accidentally thrown away every year in the United States. “The coins get swept off restaurant tables, mixed in with scraps when people empty their pockets, and vacuumed up from carpets or sofa cushions,” an attentive reader could learn. “The money used to end up in the dump.” But the situation has changed: Landfill-disposal costs rose up to 25 percent within the last ten years in the United States. That had created an incentive for American companies to develop ways to sift through mountains of waste and extract steel, iron, aluminum and copper for sale to recyclers.



This also applies for the US-based company Covanta, an international provider of waste and energy solutions. As reported, an incinerator near Philadelphia “produces” within one year coins worth 360,000 US-Dollar, which can be found in the incineration ashes. But the company has to store the money as it waits for the U.S. Mint to resume coin purchases under an exchange program, which was suspended in November last year, because there have been suspicions of counterfeiting.

According to the information, Covanta has recovered metals from the ashes at its power plants since 2011. Over five years, the company has recuperated more than 2 million tons of metal that was sold to recycling companies. That generated 61 million US-Dollar in 2015, or 3.7 percent of Covanta’s revenue. “In 2017, the company plans to open a central facility to sort aluminum, copper and coins captured at plants in the Northeast and Mid-Atlantic,” Bloomberg informed.

Europe also takes pride in its circular economy. However, there are great differences and, sometimes, enormous deficiencies. In Sweden, the parliament is considering to give people a financial incentive for repairs (home appliances, shoes, bicycles, etc.). As reported, this measure shall meet a growing desire in the Swedish society to consume in a more sustainable way, as well as a broader government strategy to reduce the carbon emissions from consumerism. In contrast to this, in Albania (the country was awarded candidate status by the European Union in 2014) material imports for recycling are not appreciated by all. In October, several thousand Albanians protested to demand the government to “scrap a law allowing waste imports for recycling that has revived fears the country could become Europe’s refuse dump,” the news agency Reuters gave account. But in Slovakia, ReCobal – a new collection and recycling system operating since July, supported by the international service provider Reclay Group – is fulfilling the legal obligations arising from the new Slovak Waste Management Act which came into force in January this year.

The Republic of Turkey – a bridge between Europe and Asia – has shown a very significant development in the field of waste management and is taking steps to achieve the European Union’s status. Recycling becomes more important in this country (page 12). In Russia, there is also a huge market potential: According to the opinion of experts, the waste management – including recycling – will evolve into a multi-billion dollar business (page 24). Furthermore, there is also a requirement for investments in the Republic of Cuba and the demand of foreign investors grows (page 27).

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

Yours

Brigitte Weber (weber@msvgmbh.eu)



12 | Turkey: Huge Market Potential and Dynamics



24 | Russia: There Will Be a Change



18 | "We are relying on Methods, which are no longer contemporary"



27 | Cuba's Recycling Industry: Slowly Requested by Foreign Investors



29 | Demand for Copper Could Increase by 213 to 341 Percent

Business Chances

- 03 | Turkey Introduces Incentives for Investments
- 04 | Modernization of the Iranian Raw Materials Sector: Chances for Investors and Providers
- 04 | India: Recycling of Old Cars and Trucks
- 05 | Future Opportunities in the Gulf Region

Newsflash

- 06 | New Objective: Towards a 100 Percent Recyclable Aircraft
- 06 | Market Report: Commercial Aircraft Disassembly, Dismantling & Recycling
- 06 | Recovery of Gold and Palladium from E-Scrap
- 06 | UK: Start-Up of the New Dunbar Energy Recovery Facility

Enterprises

- 07 | US Automotive Aluminum Recycling at a Very High Rate
- 08 | USA: GM Recycles Water Bottles to Make Car Parts
- 08 | Kia: Recycling Rate Increased by 93.7 Percent
- 09 | Malaysian Company Ordered Recycling Plant for E-Scrap
- 09 | Rapid Growth: Global E-Waste Management Market
- 10 | Best Practices in Recycled Plastics
- 10 | Veolia Joins New Plastics Economy Initiative
- 11 | Recycling Meets Fashion
- 11 | New Textile Sorting Plant in United Arab Emirates

Markets

- 12 | Turkey: Huge Market Potential and Dynamics by Establishing New Partnerships
- 14 | New Gas Blending Technology for Landfill Cogeneration Units
- 15 | Raw Material Imports Reflect the Economic Situation
- 16 | Turkey: Business as Usual
- 17 | High Investments in the Environmental Sector

- 18 | "We are relying on Methods, which are no longer contemporary"
- 20 | An Efficient Solution for Mixed Waste
- 22 | A Waste-Schengen Zone: Rather a Dream Than Reality
- 23 | Ghana Gets Support to Recycle E-Waste
- 23 | Global Solid Waste Management Market: Strong Growth up to 2023
- 24 | Russia: There Will Be a Change
- 26 | Sustainable Phosphorus Use
- 27 | Cuba's Recycling Industry: Slowly Requested by Foreign Investors
- 29 | Demand for Copper Could Increase by 213 to 341 Percent

Machinery

- 30 | New System for Fiber and Film Sorting
- 31 | Chinese Waste to Be Treated with European Technology
- 32 | Eddy Current Separators "Made in Spain"
- 32 | VacuDry Drilling Mud Treatment Plant Delivered to Baku
- 33 | High-Performance Machinery
- 33 | New Landfill Compactor
- 34 | Mexico's First Commercial Waste to Energy Facility Started Up
- 34 | Colombian Egg Producer Invests in German Energy Plant Technology

Events

- 35 | Electronics & Cars Recycling (World Recycling Forum)
- 35 | Plast Eurasia Istanbul 2016
- 35 | IFAT Eurasia 2017
- 36 | IdentiPlast 2017
- 36 | Plastics Recycling Show Europe Moves to Amsterdam

- 36 | **Index**
- 01 | **Imprint/Editorial**

Turkey Introduces Incentives for Investments

As was reported by Invest in Turkey, the investment support and promotion agency of the country, a new tax law was published in the Official Gazette on August 9, 2016, and thereby entered into force. Aim is to improve the investment climate in Turkey.

"Drafted with an aim to ease burdens that might hinder the ability to conduct business in Turkey, the law encompasses 79 articles, 47 of which are related to tax regulations," the agency gave account. "The most significant amendments include investment incentives, incentives for service exports, incentives for regional management centers, transfer pricing regulations, exemption for industrial property rights, incentives for energy savings projects, and exemptions on stamp duty in certain cases."

The new law implements tax advantages for fixed asset investments. According to Invest in Turkey, the actual contracts of investments made within the scope of an investment incentive certificate are exempt from stamp duty. Also, buildings constructed within the scope of such certificates and the lands with regard to these investments within the term of the certificate are exempt from real estate tax. Renovation or reconstruction of a building or facility within the same scheme is also exempt from fees paid to municipalities.

The new legal situation establishes incentives for service exports as well. "Under this new scheme, income tax exemptions are implemented for the salaries of employees working in companies operating in the fields of architecture, engineering, design, software,



medical reporting, accounting entries, call centers, product testing, certification, data storage, data processing, data analysis, health, and education." Regional management centers operating under a permit granted by the Ministry of Economy do not have to pay the corporate tax when meeting certain conditions. Moreover, salaries of employees working in these centers are exempt from income tax.

With regard to transfer pricing regulations, methods have been updated based on the OECD's Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations, the agency reported. "The new law allows for the ability to deduct value-added tax paid during imports or through a reverse charge mechanism for related party transactions in which it is considered that disguised profit distribution is made through transfer pricing."

The new Turkish law also sees the introduction of incentives for energy

saving projects: Expenses for heat insulation and energy saving investments may be directly deducted from the tax base. In addition, the physical contracts and related transactions of such projects are exempt from stamp duty and fees.

Low impact of the failed coup attempt in July

As reported by the Turkish online medium Hürriyet Daily News in early August, the negative impact of the July 15 failed coup attempt on Turkey's economy has been minimal. "The foreign exchange rates have been going back to pre-July 15 levels, while the country's main stock exchange index has been climbing confidently towards a level that is higher [than] prior to the coup attempt," the head of the Istanbul Chamber of Commerce (ITO), İbrahim Çağlar, was quoted. The Turkish economy has maintained its credibility in the eyes of the investors, he stated. In his opinion, there are no obstacles for foreign investors to continue their economic activities in safety.

This may be good news for the business partners of Turkish companies. Not only Turkey's plastics processing industry is heavily dependent on imports. This applies also to raw materials such as scrap metal, recovered plastics and recovered paper.



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Modernization of the Iranian Raw Materials Sector: Chances for Investors and Providers

The BGR has collected the main facts about the resource potential of the country and the most important investment plans regarding the raw material sector in a short report called "Iran – current position of the raw materials management industry". Iran has significant hydrocarbon stocks but emerges regionally as an important producer of mineral raw materials, whose output can clearly be increased on a long-term basis, according to current plans.

Iran has significant hydrocarbon stocks but emerges regionally as an important producer of mineral raw materials, whose output can clearly be increased on a long-term basis, according to current plans.

In Iran, more than 60 different mineral raw materials are gained. The delivered quantities are – except for some industrial minerals or rather stones and earths – compared to the global scale low and not comparable to the hydrocarbon sector. Nevertheless, Iran is regionally an important producer, for example of steel and copper. The development in the production and the domestic consumption of refined crude steel, copper, aluminum, lead and zinc shows an increase of the total volume within the last ten years. Moreover, it is clear that the refined non-ferrous metals production considerably exceeds its consumption. With the exception of crude steel, Iran is to be classified as a net exporter of these products.

The production of not energetic mineral raw materials, including stones and earths, currently takes place in about 5,000 active companies. About 620.000 people are employed in this sector. Mines and cabins are predominantly in government-run roof operator's, called Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), possession. Partly those cabins and mines are in private hands. IMIDRO is both responsible for the design, realization, and observance of the mining framework conditions (exploration, extraction and royalties) and for the implementation of new mining projects. The organization currently competes for private and foreign investments. IMIDRO thereby functions as joint-venture-partner and stockholder, especially in the case of major

projects. An important foundation for the modernization of raw materials sector is provided by the permanent suspension of trade sanctions and the enhancement of securities. Thereby new chances for internationally active companies could emerge – from the granting of innovative technologies to the delivery of machines and facilities as well as processing investments.

"Iran – current position of the raw materials management industry" has been released as Commodity Top News 49 by BGR and DERA under the following link www.bgr.bund.de/DE/Gemeinsames/Produkte/Downloads/Commodity_Top_News/DERA/ctn_49_iran.html.

Source: Bundesanstalt für Geowissenschaften und Rohstoffe



India: Recycling of Old Cars and Trucks

In India, there are plans to build the country's first vehicle shredding and recycling center.

According to Indian Media and News Agency Reuters, the company Mahindra Intertrade will set up the first plant in partnership with state-controlled MSTC Limited near a port. It is intended that operations begin in early 2018.

As reported, India is considering introducing a policy to scrap old vehicles, like the cash-for-clunkers program the United States tried during the global economic recession to boost auto sales. The government also plans to enforce stricter vehicular emission rules, potentially opening up an opportunity for companies to recycle older cars and trucks.

India currently does not have an organized car breaking industry. As a result, most of the scrap needed by steelmakers and other industries is imported. The planned shredding plant could replace imported scrap and cut India's foreign exchange outflow, the steel ministry was quoted. "Though vehicles are typically licensed to run for only 15 years in India, there are about 30 million vehicles on roads that pre-date 1990," Reuters stated.

About MSTC

Since its inception in 1964, under the administrative control of the Indian Ministry of Steel, MSTC Limited has

endeavored to become one of the stalwarts of the nation's steel industry. Till 1991 the company was the canalizing agency of the Government of India for import of scrap and ships for breaking.

Recently MSTC established itself as a major player in importing bulk raw material for various industries. It has emerged as the only Public Sector Company in India dealing in e-Commerce. The new initiatives by MSTC are related to investments in various new ventures and the development of constructive partnerships with international, national, regional and local authorities.

Future Opportunities in the Gulf Region

Sustainability will be the governing force, driving the change on how waste is addressed in this region.

According to a new study conducted by the consulting company Frost & Sullivan's Energy and Environment Research Team, the rise in waste, especially municipal waste, is likely to become a major reason for concern for the Gulf Cooperation Council (GCC, an intergovernmental political and economic union consisting of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates). It is estimated that the total waste generated will increase from 94 million tons in 2015 to as high as 120 million tons per annum by 2020.

As projected, this will be spurred by the rapid increase in waste generation predominantly in the Kingdom of Saudi Arabia and the United Arab Emirates. "The rise is significant as municipalities in the GCC are not equipped to handle this level of waste generation through the existing land-filling strategies," Frost & Sullivan found out. "Adoption of alternate handling mechanisms to deal with the problem of increasing waste would be required, especially when the block of countries is also striving to make amends to the energy mix."

GCC will have to make a radical move towards integrated waste management with emphasis on 'waste-to-value' methods such as recycling and waste-to-energy coming into the picture, Abhay Bhargava, Associate Director and Regional Head – Middle East – Energy & Environment Group, is convinced. This could already be seen in the form of the recent tenders for waste management in the GCC, as well as in the Middle East and North Africa (MENA). Based on recent studies that Frost & Sullivan has undertaken as part



Photo: Armin Volkmann / pixelio.de

of a global waste management advisory practice, the market potential for waste can increase anywhere by 1.5-2 times in the next five years. This will also disrupt the existing waste management industry, which has so far primarily focused on the aspects of collection and transportation.

Additionally, there is also a need for greater focus on optimizing the segregation process, both at source and at material recovery facilities to minimize waste diversion to landfills. Another disruption would be in waste composition itself. While waste in the GCC has predominantly been construction, demolition and municipal, a rapid emergence of electrical and electronic waste, industrial hazardous and bio-medical waste is also being observed.

Frost & Sullivan feels that this disruption will result in emergence of opportunities in the sector for companies that can deliver solutions around segregation, recycling, sustainable treatment, and waste-to-energy across services, technologies, and equipment. "The need of the hour, considering the current scenario, would be to look at skills development, partnerships, and technology acquisition, all of which require a more formalized approach to the business of waste," the experts said. Frost & Sullivan also believes that municipalities in the GCC can accelerate optimization through benchmarking and assessment of successful models in other regions, and implementation of these learnings in the regional context.

➔ www.frost.com

India: Plastic Waste Will Be Used for Road Constructions

The Maharashtra government has decided to use plastic waste along with tar to build roads, Indian media gave account. The goal of this measure is to improve the durability and longevity of asphalt roads and reduce soil pollution. According to the provided information, the Indian CSIR-Central Road Research Institute has assured the government that roads built by using plastic waste along with tar will be of better quality and cheaper. As reported, municipal corporations with a population of over 500,000 and municipal councils with a population of over 200,000 will be asked to include plastic waste for building roads in a radius of five kilometers. For every 100 kilograms of tar used to build asphalt roads, three to six kilograms of plastic will be mixed in it.

New Objective: Towards a 100 Percent Recyclable Aircraft

As part of Montréal Civil Aviation Week, Canadian Aéro Montréal (the think tank of Québec's aerospace cluster) brought together nearly 400 participants for a case study competition on the development of a 100 percent recyclable aircraft. A panel of experts awarded top honors to Cyclair project, from École Polytechnique of Montréal, while all the participants

learned more about this future challenge. According to the provided information, aircraft recycling is one of the main challenges for the future of the global aerospace industry. Post-secondary and university students from Québec were asked to develop a sustainable and profitable solution for recycling all the components of an end-of-life aircraft in Québec.

"Over the past five years, the average lifespan of a commercial aircraft has fallen to 26 years from 31 years, which has accelerated the end of life of these aircraft," Aéro Montréal underlined. About 6,000 commercial aircrafts would be decommissioned in the next 20 years while the number of passengers would total 7.3 billion by 2036.

Market Report: Commercial Aircraft Disassembly, Dismantling & Recycling

The report from UK-based business intelligence provider Visiongain offers comprehensive analysis of the global aviation market. The company assesses that this market will generate revenues of 5.6 billion US-Dollar in 2016. Ashraf Kazi, Visiongain's aviation analyst and author of the report, commented that the extensive economic and structural benefits of composite materials have resulted in the next generation of aircraft. "However, carbon and plastic composites

are difficult to recycle due to their bonding properties and their heterogeneous structures. The next 20 years will see significant investments into improving the recyclability of these materials in all sectors, especially the aviation and the motor industry." The 253 page report contains 221 tables, charts and graphs. As reported, Visiongain provides a range of forecasts for the period 2016-2026 as well as for four submarket sectors:

- Aircraft Storage

- Aircraft Disassembly & Dismantling
- Engine Teardown
- Component Management

The four submarket forecasts are revealed at the global level and also for North America, Europe, Asia-Pacific and the rest of the world, the company assures.

➔ www.visiongain.com/Report/1727/Commercial-Aircraft-Disassembly-Dismantling-Recycling-Market-Report-2016-2026

Recovery of Gold and Palladium from E-Scrap

The rise in gold and palladium prices is significantly increasing the profit potential of e-scrap recycling. That is one of the reasons why US-based Itronics Inc. has started a campaign to produce commercially saleable silver bullion from a mixture of its internally generated silver concentrates and e-scrap (ground up computer circuit boards).

"An important objective of this campaign is to obtain measurement data related to recovery of copper, gold and palladium from e-scrap and the composition of the bullion that is produced," the Reno-headquartered fertilizer, silver, and minerals producer announced in July. Silver bullion production would continue and increase throughout the year.

Itronics has been processing silver-bearing photographic liquids and accumulating the silver-bearing solids since December 2013. "The five times scale up of the leaching pilot plant is nearing completion, which will help maintain silver production going forward by processing the backlog of silver-bearing concentrates," the company gave account.

UK: Start-Up of the New Dunbar Energy Recovery Facility in 2017

The Finnish-based technology provider Valmet has signed an agreement with Babcock & Wilcox Vølund A/S to supply automation technology for the new Dunbar energy recovery facility (EFR) in East Lothian, Scotland, UK. The company's delivery, which is scheduled for March 2017, consists of a Valmet DNA automation system, an information management system as well as integrated safety and condition monitoring systems.

Once in operation in late 2017, the Dunbar ERF will have a capacity to treat approximately 300,000 tons of waste per year. According to Valmet, it will generate 30 megawatts (MW) of base-load renewable energy directly to the grid, enough to continuously power 39,000 homes. Additionally, the plant will offer up to 10 MW of heat for local use. As reported, the plant investment is in line with the Scottish Government's ambition to

deliver zero waste, encourage waste reduction, boost recycling and recover vital renewable energy.

The Danish-based company Babcock & Wilcox Vølund provides the technology for the Dunbar EFR and is responsible for its engineering, procurement and construction. The plant will be operated and maintained by Viridor, one of Europe's major waste management companies.

US Automotive Aluminum Recycling at a Very High Rate

The overall recycling rate for automotive aluminum in the USA is 91 percent. The weighted average material collection rate for end-of-life vehicles that flow through a dismantling operation and a downstream separation system is 99.7 percent.

When a heavy gauge scrap class is charged – referred to as a heavy recovery process – a metal yield of 95 percent is attained. Light gauge scrap melting – referred to as a light recovery process – is estimated to result in a metal yield of 91 percent. The majority of automotive aluminum is charged as a light gauge, mixed, shredded scrap. It has been estimated that 86 percent of obsolete auto-aluminum is charged in this form. These are the results of a new research from the Center for Resource Recovery and Recycling at Worcester Polytechnic Institute that was funded by the Aluminum Association.

“We set out to detail exactly how aluminum is separated and recovered at the end of a vehicle’s service life, and findings show it is highly recyclable and is recovered and reused at very high rates,” said Professor Diran Apelian, founding director at the Worcester Polytechnic Institute. A sensitivity analysis was conducted to determine a minimum and maximum automotive aluminum recycling rate percent for the US. This recycling rate range is 80 percent to 98 percent. The weighted average of 91 percent falls within this range and is estimated to be much more representative of the entire industry in comparison to these extremes.

But there are still two information gaps. The loss of end-of-life vehicles



Photo: O. Kirth

to landfill respectively the number of vehicles that ultimately end up in a recycling system somewhere could be further examined and investigated. And an analysis on aluminum alloys potentially diverted to other material streams during the recycling processes would be worthwhile.

The distributed surveys covered 5 percent of the United States’ dismantling industry considering the amount of end-of-life vehicles entering the survey respondent’s lots, 32 percent of the downstream separation system industry based on volumetric throughput and 60 to 70 percent of the secondary aluminum production industry based on market share responses.

In its own appraisal, “the study provides one of the best quantifications to date of the average percent (91

percent) of aluminum currently being recovered by the recycling systems in the US. This level of metal recovery is considered highly efficient and effective.” And Tom Boney, chairman of the Aluminum Association’s Aluminum Transportation Group (ATG) and vice president and general manager Automotive Value Stream, Novelis North America underlined: “As the United States and the rest of the world continue to strive for a more environmentally friendly future, aluminum is a big part of the solution and this new data confirms it.”

To view the full report: Automotive Aluminum Recycling at End of Life: A Grave-to-Gate Analysis, please visit ➡ <http://drivealuminum.wpengine.com/wp-content/uploads/2016/06/Final-Report-Automotive-Aluminum-Recycling-at-End-of-Life-A-Grave-to-Gate-Analysis.pdf>

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USA: GM Recycles Water Bottles to Make Car Parts

In former times, only a few producers had the courage to admit that they use recycled materials in their brand new cars. But now recycling is a good selling point.

US-based car manufacturer General Motors Co. has underlined in a press release that the company is turning its employees' recycled water bottles into noise-reducing fabric insulation that covers the Chevrolet Equinox engine. The bottles – collected from five of its Michigan facilities – are also being turned into air filtration components, which are used in GM facilities to protect air quality and insulation in coats for the homeless community.

"Recycling is good, but viewing waste as a valuable resource that can be plugged into your operations or products is even better," John Bradburn, GM global manager of waste reduction, was quoted. "It is about rethinking the process and finding more sustainable ways to manufacture products and contribute to our communities."

As reported, the American car maker has pursued this project after analyzing its impacts from a holistic business case:



John Bradburn, GM's global manager of waste reduction

- Sourcing recycled material costs the same while saving energy and reducing waste.
- Engaging a network of companies to process the material in North America strengthens the economy.
- Donating 24,000 yards of insulation – enough to make 6,500 coats – helps the homeless.

According to GM, the producer demonstrates how a supply chain can become a supply web where business opportunities stem from an original project, furthering the mission and driving more social and economic impact. "Each partner engaged in this initiative brings specific capabilities," the company emphasized. Hamtramck Recycling bails the plastic bottles collected from GM's world headquarters at the Renaissance Center, Warren Technical Center, and Orion Assembly, Flint Tool and Die, and Flint Engine plants. Clean Tech Inc. washes the bottles and converts them to flake. Unifi, Inc. recycles the bottle flake into resin. Palmetto Synthetics processes

the resin to create fibers, and William T. Burnett & Co. processes the fibers into various forms of fleece, serving all three applications.

- Rogers Foam Corp. die-cuts the fleece and EXO-s attaches it into the nylon cover for the Chevrolet Equinox V6 engine. The part helps further dampen engine noise to deliver a quiet ride.
- Filtration Services Group works with New Life Center, a nonprofit jobs development and training mission in Flint, to make the panels for the air filtration fleece, which is then sent to ten GM facilities.
- The coat insulation is sent to Carhartt, a workwear company established in Detroit in 1889, which cuts it to size.

Moreover, GM is working with various organizations to collect additional water bottles to plug into the project. Furthermore, the car maker uses recycled content in many of its vehicles: "Cardboard from various GM plants is recycled into a sound-dampening material in the Buick Verano headliner; plastic caps and shipping aids from its Fort Wayne facility are mixed with other materials to make radiator shrouds for the Chevrolet Silverado and GMC Sierra; and test tires from Milford Proving Ground are shredded and used in the manufacturing of air and water baffles for a variety of cars. According to the provided information, the company has 131 landfill-free facilities around the world and recycles the equivalent of 38 million garbage bags of by-products each year.

➞ www.gm.com



The Chevrolet Equinox V6 engine cover, set on top of the engine as a demonstration, includes water bottles collected from five GM facilities

Kia: Recycling Rate Increased by 93.7 Percent

The vehicle manufacturer Kia has increased the recycling quote to 93.7 percent in his Korean factories in 2015. The company forwarded production residuals of galvanized steel to Korean steel manufacturer and utilized uncoated steel parts themselves in the foundry of the factory called Gwangju. Moreover, Kia introduced programs for the recycling and re-utilization of car paints and diluters. Furthermore, other waste is used for the production of building cement. The landfill's rate of the entire company's volume of waste amounted to only one percent. The company was able to reduce the steel insert per vehicle by 22.1 percent and the consumption of lacquer by 11.7 percent compared with 2003.

Malaysian Company Ordered Recycling Plant for Electrical/Electronic Scrap

Malaysian company Shan Poornam Green Tech has ordered an automatic recycling plant for refrigerators and electrical/electronic waste and recovery of chlorofluorocarbon (CFC) and equivalent. The facility will be provided by Andritz MeWa.

As from mid-2017, the plant - located in Seberang Perai in the state of Penang - is intended to process annually around 300,000 old refrigerators and up to 60,000 tons of electrical and electronic scrap from private households. Shan Poornam Green Tech, a subsidiary of Shan Poornam Metals Sdn Bhd (a company specializing in scheduled waste and non-scheduled waste recycling with headquarters in Penang) will act as the operator.

According to the information, a central element of the recycling plant is Andritz MeWa's QZ 2000 Cross-Flow Shredder. "Unlike multi-stage cutting technologies, rotating chains in the QZ dismantle the various components and materials quickly and efficiently in an environmentally friendly way," the company said. "The single parts can then be separated into individual fractions, such as iron, copper, aluminum, and plastics. In addition, batteries and condensers remain intact and can be sorted without leaking any contaminants. When processing refrigerators and air-conditioning units,



Photo: Andritz

Ceremonial signing of the contract between Shan Poornam Metals and Andritz MeWa

the fully enclosed system ensures that any gases escaping, like CFC and pentane, can be removed by suction and disposed of by environmentally friendly methods."

As reported, this is the first automatic processing plant for refrigerators and electrical/electronic scrap in Malaysia.

Shan Poornam Metals intends to set up 86 collection centers for household electrical/electronic scrap as part of a subsidy program over a period of five years to ensure continuous utilization of the capacity of the new recycling plant.

➔ www.andritz.com

Rapid Growth: Global E-Waste Management Market

According to a report, offered by US-based Market Research Store, the global demand for e-waste management is expected to reach 58.0 billion US-Dollar in 2021.

In 2015, the global e-waste management market was valued at 17.0 billion US-Dollar. In terms of volume, it stood at 86.40 million tons in 2015. As reported, North America accounted around 33.0 percent share of the total revenue generated in 2015. The region was followed by Europe in the same year. Furthermore, Asia Pacific is seen as one of the fastest growing regional market for e-waste management. According to the provided information, China purchases five million new computers and ten million new televisions annually. Hence, the growth in e-waste management market is foreseen in India and China over the years to come.

The report was originally published by market intelligence company Zion Research and is titled "E-Waste Management Market by Type (Trashed and Recycle), by Source (Household Appliances, IT & Telecommunications, Consumer Electronics and Others): Global Industry Perspective, Comprehensive Analysis and Forecast, 2015 - 2021." More information is available at ➔ www.marketresearchstore.com/report/e-waste-management-market-z62610



Photo: mekar / fotolia.com

Best Practices in Recycled Plastics

Brussels-based association Digitaleurope^{*1)} has published a paper with selected best practices in recycled plastics of the European information and communications technologies (ICT) industries.

It was developed to showcase current best practices of early adopters, highlight the challenges ahead to policy-makers and inspire other sectors and producers. It contains an initial assessment of the market size and expected trends as well as opportunities and challenges in using recycled plastics. The last section of the paper gives room to a number of case studies from the ICT industry, ranging from printer cartridges to printers and closed-loop recycling in monitors.

"The idea for this paper emerged from a series of industry workshops and visits to recycling plants," Digitaleurope reported. "It is clear that the widespread use of recycled plastics in all ICT products remains a challenge. However, with a combination of economic incentives and technical progress, the ICT industry could make a meaningful progress. The case stud-

ies in the paper show that it is feasible to use recycled plastics in a number of ICT products when innovative solutions are explored for particular products or components."

Since the early 2000s, the digital technology industry has been experimenting with the use of recycled plastics in electric and electronic equipment (EEE), the association underlined. "Recycled plastics are now found in a variety of ICT products as companies start to use recycled plastics as part of voluntary agreements/certifications or broader green marketing initiatives."

According to the provided information, the imaging equipment industry has signed a voluntary agreement (VA) in the framework of the Ecodesign Directive, which requires producers to declare the use of recycled plastics to

customers since 2015. The agreement was signed by 15 producers that account for more than 95 percent of all office and household imaging equipment sold in Europe. Declaration requirements of the use of recycled plastics are also in the ECMA 370 Eco Declaration^{*2)}.

The publication "Best Practices – Recycled Plastics Paper" can be downloaded under ➡ www.digitaleurope.org/Press-Room/Publications.

^{*1)} Digitaleurope represents the digital technology industry in Europe; the members include some of the world's largest IT, telecoms and consumer electronics companies and national associations from every part of Europe.

^{*2)} Standard ECMA-370 (5th edition, June 2015) specifies environmental attributes and measurement methods for ICT and CE products according to known regulations, standards, guidelines and currently accepted practices.

Veolia Joins New Plastics Economy Initiative

French-based corporate group Veolia Environnement S.A. has joined the New Plastics Economy initiative, which is led by the Ellen MacArthur Foundation, as a core partner.

According to the information, "the New Plastics Economy is an ambitious, three-year initiative to build a momentum towards a plastics system that works. Applying the principles of the circular economy, the initiative brings together leading companies, cities, philanthropists, policymakers, academics, students, NGOs, and citizens to re-think and re-design the future of plastics, starting with packaging."

The initiative builds on the recommendations of the report "The New Plastics Economy: Rethinking the Future of Plastics" issued by the Ellen MacArthur Foundation and the World Economic Forum, at the Annual Meeting in Davos in January 2016. As reported, it provided the first comprehensive view of the global plastic packaging value chain, highlighting its contributions but also revealing significant drawbacks. "With material

value loss running at 80 to 120 billion US-Dollar a year in the industry and negative environmental externalities costing at least 40 billion US-Dollar a year – a figure greater than the plastic packaging industry's profit pool – the opportunity for the global economy of transforming the system is clear," Veolia gave account. The New Plastics Economy initiative would take a concrete first step towards the design of a plastics system grounded on circular economy principles. The company will contribute to shaping the work program and selecting the projects and pilots through participation in the advisory board.

Investment in UK plastic recycling

In July, Veolia UK has acquired manufacturing assets in London which will unlock the supply chain for manufacturing plastic bottles from recycled material. As reported, the company

will be able to offer the range of services from collection of raw feedstock (waste plastic bottles) direct from people's homes or businesses, through all the recycling steps, and back to food grade pellets ready to be blown into new bottles.

The new business will produce around 10,000 tons of high quality food grade HDPE pellets annually. "Recycling this material requires 75 percent less energy to make a plastic bottle than using 'virgin' materials, and this equates to conserving enough energy to power around 20,000 homes and saving 10,000 tons per annum of carbon emissions," the company assures. "The move also complements Veolia's recent commitment as a core partner to the Ellen MacArthur Foundation's campaign to support the Plastics Economy."

➡ www.newplasticseconomy.org

Recycling Meets Fashion

Recycling and the use of recycled materials are “en vogue” within the international fashion industry, and obviously there is money to be made in this area. Recent examples include the brands Zara and Timberland.

Like the Swedish multinational clothing-retail company H&M Hennes & Mauritz AB, the Spanish clothing and accessories retailer Zara is committed to sustainability and recycling. The new collection “Join Life” is made with materials (like recycled wool or organic cotton) aimed at reducing environmental impact.

Additionally Zara is committing to using boxes from 100 percent recycled cardboard. These “boxes with a past” initiative means that boxes are packed and reused in stores up to five times before the cardboard is recycled and transformed into new boxes. According to the company’s website, more than 50 percent of all online orders are currently delivered in these recycled boxes. In this way, the retailer is able to avoid the felling of some 21,840 trees and reduce its CO₂ emissions by 1,680 tons a year, Zara underlined on the company’s web site.

Apart from that Zara collects used clothes in the company’s stores. According to the homepage, there are over 300 containers in Spain, Portugal, and in selected stores in the UK, Ireland, the Netherlands, Sweden and Denmark. “We will increase the number of drop-off points in these countries over the

year, and we will begin to set up collection points in our stores in China,”

the Spanish retailer announced. “In 2017, we will set up containers in Germany, France, Italy, Poland, Greece, Austria, Switzerland, Japan, the USA, Russia, Korea and Australia, and we will continue working so that in the next three years you will be able to donate clothes you wish to recycle in any of our stores worldwide.”

Timberland issued own standards

The US manufacturer and retailer of outdoors wear Timberland LLC is also active in this area. The company has established the “Timberland Environmental Product Standards” (TEPS) across all product categories. “By creating environmental targets for the entire line, we

materials, especially materials like recycled rubber and recycled PET,” the company assures on its homepage.

According to the provided information, TEPS will play a key role in helping the manufacturer achieve its 2020 product goals:

- “100 percent of footwear will include at least one material containing recycled, organic or renewable (ROR) content.
- 100 percent of footwear and outerwear leather will be sourced from tanneries that have earned a Gold or Silver rating from the Leather Working Group for following environmental best practices.
- 100 percent of apparel cotton will come from organic, US-origin or Better Cotton Initiative–certified sources.
- 100 percent of footwear and apparel will be PVC-free.”

In order to stress this message Timberland announced in June this year a partnership with US fabric manufacturer Thread. As reported, this company transforms plastic bottles from the streets and canals of Haiti and Honduras into responsible fabric and creates social value in the form of cleaner neighborhoods and jobs for thousands of people. “The partnership – the largest to date for Thread – will bear its first fruit in spring 2017,” Timberland announced.



Photo: Zara

The collection is made with materials such as recycled wool

aim to significantly increase our use of recycled, organic and renewable

New Textile Sorting Plant in United Arab Emirates

The German Soex Group, a company in the field of used textile marketing and recycling, has announced that it will build a new sorting facility in the United Arab Emirates. The operation of the plant (investment: 5 million Euro) located in Hamriyah Free Zone is scheduled for the middle of 2017. According to the company, it intends to export from the new site 50 percent of its products to African countries and 25 percent to Eastern Europe and the Middle East respectively. It is also planned to implement recycling projects in Hamriyah at a later date. As reported, the expansion of storage and sorting capacities in the United Arab Emirates will enable the company to react more flexibly and cost-efficiently to future shifts of the market. The Soex Group is active on an international scale. With offices and shareholdings in five countries and about 1,000 employees, the group covers the entire value chain for used textile collection, marketing, recycling and reuse on six continents.



Turkey: Huge Market Potential and Dynamics by Establishing New Partnerships

“In Turkey, studies in the field of waste management have shown a very significant development in the last 12 years, with increasing social and political sensitivity.

The steps are being taken to implement the economic size of the waste with National Recycling Strategy Action Plan that is considered as an important point to reach our vision of 2023”, underlined Prof. Dr. Mustafa Öztürk, Undersecretary at the Ministry of Environment and Urbanization in 2014.

In fact, the latest figures the Turkish Statistical Institute released on waste in December 2015 show an increase in the waste treatment: a total of 985 facilities, 117 of which were waste disposal facilities, including 113 controlled landfill sites and four incineration plants. The 868 recovery facilities consisted of four composting plants, 39 co-incineration plants with energy recovery and 825 other recovery facilities. Moreover, 45 sterilization facilities treated medical waste that was disposed of by two third in controlled landfills and by one third in municipal dumping sites. Another contemporaneous source reported an annual added value in excess of 756 million Euro in 2015 that increased the number of packaging waste recycling plant to 642 and 497 sorting plants to 497. In its latest enlargement report on Turkey in November 2015, the EU commission balanced: “Work has continued to bring waste treatment facilities up to EU standards. Sorting, recycling, medical waste treatment capacity and hazardous waste recycling have increased.”

Resulting, the 39 co-incineration plants in 2012 burned 532,000 tons of waste with energy recovery. The compost-

ing facilities with a total capacity of 310,000 tons/year processed 94,000 tons of waste and produced 34,000 tons of compost. 43,000 tons of waste – 40,000 tons hazardous and 3,000 tons non-hazardous – were disposed of in the four incineration plants. And the 825 licensed recovery facilities handled a total amount of 19 million tons of waste metal, plastic, paper, mineral etc..

Poor recycling rates

Turkish household waste is made of 34 percent organic kitchen waste, 22 percent non-combustible and 19 percent combustible materials, 20 percent packaging waste, 16 percent paper and cardboard, six percent glass, two percent plastics and one percent metals. Given an annual amount of scarcely 29 million tons of municipal waste, there should be a respectable quantity of recycled material. According to the above-mentioned “National Recycling Strategy Document and Action Plan 2014-17” published by the Turkish Ministry of Science, Industry and Technology, more than half of the waste generated in Turkey can be recycled.

Of course does the absence of data not necessarily equate to a poor performance of the waste management system. But following the European Environment Agency, the Turkish municipal waste recycling quote from 2001 to 2010 varied between 0.6 and 1.2 percent, Recycling Waste World certificated "poor recycling rates due to the lack of adequate facilities and incentives", and the current ISWA Waste Atlas simply offers a recycling rate of Zero. The Environmental Protection and Packaging Waste Recovery & Recycling Foundation CEVKO estimates that every year paper, metal, plastic, glass and wood scrap of Euro 302 million worth are lost by reason of missing waste separation.

There is some potential

In that context, the European Environment Agency 2013 found out that out of the approximate 30 million tons of municipal waste generated in 2010, 84 percent were collected and about 98 percent of them were landfilled either in sanitary landfills (54 percent) or dumpsites (44 percent) – with no available information regarding the fate of the uncollected amount of municipal waste. And Mustafa Öztürk emphasized that in 2012 the "disposal technologies" for collected municipal waste included 29 percent dumpsite and 71 percent "landfill compost".

However, there is some potential especially in packaging waste, stated Mustafa Öztürk. The total economic value that can be gained to Turkey's economy from packaging waste is nearly about 2.1 to 2.7 billion Euro per year, consisting of 1.13 billion Euro from waste paper recycling, 838

million Euro from waste plastic recycling, 9 to 10.5 million Euro from waste glass recycling and 38.7 million Euro from waste metal recycling. Not to forget 11.3 million Euro income from end of life tires, 26.4 million Euro from waste accumulators, 17.8 million Euro from end of life vehicles and 7 million Euro from waste oil. Öztürk is convinced: "According to Turkish National Legislation, it is aimed that 60 percent of marketed products packaging waste are obliged to collect and recover to 2020."

This is ambitious, as the current recycling targets for packaging waste in Turkey should account for 52 percent for glass, plastic, metal and paper/cardboard. And obviously they do not.

Most EU directives transposed

The legislation is not to blame. Regarding the law, the legislation on environmental issues started early. The Solid Waste Control Regulation was adopted in 1991 and the Environment Law in 1993. Meanwhile, in accordance with the related national legislation and EU legislation, regulations have passed the parliament to control hazardous, medical, package, C&D, batteries, mining, oil and WEEE wastes, to rule end of life vehicles and tires and to put sanitary landfills, waste incineration and transport of waste in order. Most of the EU waste management directives have been transposed into Turkey's national legislation and made the country more EU-friendly. But their "enforcement remains weak, especially on waste management and industrial pollution", the EU Commission judged.



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Necessary investments were estimated by the “EU Integrated Environmental Approximation Strategy (2007 – 2023)” adopted in 2006. The paper claimed waste sector costs by directives of 7,574 million Euro for sanitary landfills, 1,257 million Euro for incineration, 655 million Euro for the packaging sector and 74 million Euro for treatment of hazardous waste until 2023 – a “rough calculation”, as waste management expert Professor Oktay Tabasaran specifies. Yet another – unauthenticated – source reports investments from 1.3 billion Euro in 2010 increasing to a total of 2 billion Euro to 3.9 billion Euro between 2013 and 2023 annually. A waste market development analysis on behalf of the German Ministry of Economics in August 2012 even estimated investment needs for the implementation of EU environment regulation by 53.7 billion Euro, of which 13.4 billion Euro are entitled to the private sector: The ruling AKP prefers privatization and infrastructural measures based on the Public-Private-Partnership scheme.

Programs supported by EU

The official Turkish waste management plans were supported. In 2012, the German KfW-Bank co-financed a degazing installation at the Adana landfill and later the remediation of the Samsun landfill. In summer 2015, the European Bank for Reconstruction and Development (EBRD) launched a program in Turkey aiming at minimizing waste and increasing resource efficiency in the industry, agribusiness and municipal sectors. The program was expected to fund up to 12 investments for up to 112 million Euro in total. The European Union also supported the program with a 2 million Euro technical cooperation package through its Instrument for Pre-Accession Assistance (IPA). These so called “Near Zero Waste” Programme’s funds were available to clients of the EBRD with a private-sector focus but may include municipalities and/or municipal companies. It seems that the private sector gets more and more important in environmental fields of activity. Data announced by the Turkish Statistical Institute for 2013 reported environmental costs of the public sector at 4.5 billion Euro and environmental revenues at 3 billion Euro. However, the private sector spent 1.3 billion Euro on environmental expenses and earned 1.7 million Euro in revenues.

The private sector invests

Germany Trade and Invest, the Company for Foreign Trade and Location Marketing, has documented a development in the waste management sector as well. Besides investment of regional corporations, ITC (Invest Trading Consulting) placed a total of 672 million Euro already in 2013 to build power stations in Antalya, Alanya and Aksaray. The Sabanci Holding took 279 million Euro to change the energy recovery in the cement plants of Cimsa and Akansa over to use waste and residues. Paper producer Eren Holding planned 2014 and 2015 a new papermill worth of 300 million Euro with a 100 percent waste paper recovery.

In order to optimize the delivered metal scrap, metal and steel smelter Icdas planned to put 8.9 million Euro into a cutting unit. In March 2015 Ersem Plastik invested 1.4 million Euro in the production of plastic granulates. And Ekmekciogullari Metal ve Kimya in Corum wants to finance the expansion of its business for copper recycling with 4.7 million Euro. So GTAI draws the conclusion of “high potential for waste disposal projects” and is certain, that “Turkey promises steep growth”.

Benefits highly exceed occurring costs

So it seems to come true, what the German Ministry of Economics forecasted: “In politics the awareness is increasing to lower the import of raw materials by recovery. But the private sector rises its willingness to invest in the recovery of raw material or the avoidance of waste.” This applies to foreign investors too. A comprehensive study published by Switzerland Global Enterprise in 2013 has enumerated the benefits of the Turkish waste management market containing “huge market potential and dynamics by establishing new partnerships, business networks, solutions and marketing and sales channels in Turkey, where ‘energy’ and ‘environment’ and their related sub-sectors and (sub-) technology areas will always be on policy’s main strategic agenda”. So if any company would like to enter the Turkish waste management and waste water treatment market, “the resulting benefits arising from any project type, business case and / or R&D initiative could highly exceed its occurring costs”.

New Gas Blending Technology for Landfill Cogeneration Units

According to German-based ETW Energietechnik GmbH, the new solution improves the feasibility of land-fill gas and other combined heat and power units (CHP).

The company has developed a new equipment that blends two gas streams of different qualities to fuel CHPs. It “precisely blends the two gases to a homogeneous fuel mixture and is indicated for landfills that struggle with shrinking heating values and volumes of biogas along their lifetime,” the company emphasized. “This shrinking heating value can be compensated by gradually enriching biogas with natural gas (NG). The blending is completely automatized and designed to consume the lowest possible amounts of NG. Almost any CHP can easily be upgraded.” There are several advantages for the operator, ETW Energietechnik GmbH is convinced. At startups the CHP would receive the perfectly balanced fuel, preventing startup problems caused by low methane (CH₄) concentration. “That enables the operation of CHPs even with CH₄ concentration lower than 30 percent, increasing its lifetime and availability, thus its economic feasibility.” The CHP could be operated independently from the land-fill gas supply. ➔ www.etw-energie.de



Photo: ETW

Raw Material Imports Reflect the Economic Situation



Photo: canaran / fotolia.com

The Turkish industry is considered as a reliable customer of several secondary raw materials. However, the use of the raw materials also reflects the respective sector's cyclical situation.

The Turkish steel industry's enormous demand for scrap vaulted Turkey in the first place of the world's greatest importers of scrap. Turkey still occupies the first place, but the country collected less scrap from abroad in the past year. Turkish steel industry companies have imported 16.251 million tons of scrap, 14.8 percent less than 2014 (19.068 million tons) for the coverage of the demand for raw materials

This development is not surprising in light of the fact that the world's raw steel production has declined. According to the statistic of the Bureau of International Recycling (BIR) the global production of raw steel in 2015 decreased by 2.9 percent to 1.621 billion tons compared to the previous year. However, in 2015, the year-on-year decrease in scrap-intensive electric arc furnace production of 5.4 percent to around 403 million tons was steeper than the 2.3 percent decline in basic oxygen furnace output of some 1.201 billion tons.

The consumption of scrap declined worldwide in 2015, according to the BIR's present figures. It is, however, estimated that the globally inserted quantity of scrap amounts to 555 million tons (previous year: 585 million tons). Countries of the EU-28 used 91.1 million tons and therefore ap-

plied 0.6 percent less scrap. The People's Republic of China restricted the consumption of scrap by 4.8 percent to 83.3 million tons, USA by 8.9 percent to 56.5 million tons and Japan by nine percent to 33.6 million tons. Even Turkey reduced the utilization of scrap by 7.5 percent to 26.06 million tons.

It seems that the global scrap market's situation is not expected to ease, according to the recent BIR report of July 2016. In the first three months of this year, the worldwide crude steel production declined by 3.6 percent to 385.67 million tons compared to the reference period in the previous year, according to the world's branch association of the steel industry, the Worldsteel Association. Consequently, the global amount of scrap was lower, whereby Turkey does not even spend one percent less scrap (with an amount of almost 6.1 million tons) than in the first quarter 2015. However, the Turkish crude steel production increased by 1.9 percent.

Recovered paper

Overall, the Turkish paper industry produced 3.092 million tons of paper and consumed 2.670 million tons of recovered paper, according to the Annual Report Paper 2015 of

the German Pulp and Paper Association (VDP). In the same year, the national volume of papers collected amounted to 2.630 million tons. This measured up to a response rate of 47 percent. Furthermore, Turkey imported 80,000 tons and exported 40,000 tons of this secondary raw material.

Since then additional production capacities have been established in Turkey. Therefore, the demand for recovered paper increased heavily. BIR ambassador Ekrem Demircioglu announced in the BIR World Mirror Recovered Paper for the first quarter of 2016, that further capacities are to be expected in the longer term. It is known that two companies are thinking about possible investments, which would increase their annual production volume by 300,000 to 400,000 tons.

However, the demand for paper products declined in the first half of 2016 due to the inconvenient economic situation. According to the provided information, the brown paper mills were working at 70 percent of capacity, which had led to a reduced demand of recovered paper. It is ex-

pected that there will be several changes in the fourth quarter of this year.

Plastics

According to the statistic of the association of the Turkish plastic industry PAGEV (Turkish Plastics Industry Foundation), the industry encompasses approximately 6,500 companies, which generate a production value of 35 billion US-Dollar, whereby over 80 percent of the material, which is processed in Turkey, is imported. In 2015 raw materials worth 9.4 billion US-Dollar and end products worth 2.9 billion US-Dollar were purchased from abroad. In the same year, the Turkish industry exported raw materials worth 900,000 US-Dollar as well as end products worth 4.4 billion US-Dollar.

At the same time, the Turkish plastic recycling becomes more important, whereby significantly more than one million tons of various sorts of plastics return to the material circulation.

Turkey: Business as Usual

According to the German-Turkish Chamber of Industry and Commerce (AHK) in Istanbul, the measures, which were taken by the Turkish Government after the coup attempt in July, do not have such a strong impact as feared at first.

At the beginning entrepreneurs were unsettled due to the situation, but meanwhile the trust in the Turkish economy has been restored. According to a survey of the German-Turkish Chamber of Industry and Commerce, more than 50 percent of the AHK member companies would recommend investments to their business partners. Furthermore, the AHK informs that just as many respondents intend to implement their investment decisions. Even though the interest in company foundations declined after the coup attempt, consultancy requests of company founders would have attained the previous level.

As the German-Turkish Chamber of Industry and Commerce reported in August, the anxious company's questions were concerned about topics

as legal certainty of investments in Turkey, possible restrictions on trade respectively the clearing between Turkey and Germany as well as supply chain's stability in view of Turkish partners. The chamber of commerce did neither observe interference regarding the handling of foreign direct investments or national extension investments nor delays in the processing of the merchandise traffic. "Day-to-day businesses of companies are proceeding without restrictions", the homepage informs. Problems would affect the identification of responsible counterparts in the public administration and the associated delays of decision processes (nearly 45,000 government employees have been suspended). According to the AHK in Istanbul, the Turkish Government confirms that the coup attempt shall

not have any impacts on the legal certainty of investments and on the procedures of the economic transactions in Turkey. The Government advises the companies to engage in dialogue both with the chamber of commerce's representatives and with the Turkish business partners. Furthermore, the Government recommends to include a safety margin within the transactions. Turning away from the Turkish partners would not do justice to the current situation in the country, the AHK underlined.

Reportedly it is not possible to estimate at the moment how the long-term consequences for the Turkish economy will look like. First reactions of German middle-class companies suggest a time-limited reluctance in view of new investment projects.



High Investments in the Environmental Sector

If Turkey wants to reach the European Union's status, the country has to invest more than 27 billion US-Dollar in the areas of water, waste water and waste until 2023, according to expert opinion.

According to Germany Trade & Invest (GTAI), the economic development agency of the Federal Republic of Germany, the major part of this amount should be spent for the water economy. The water supply is managed by public companies, which are located in the provinces.

Furthermore, more than 1,400 new sewage plants are supposed to be built in the next few years, according to the Turkish Government's "Waste Water Treatment Plan". According to the GTAI-information, Turkish companies such as Enta Mühendislik, Seren Mühendislik and Gensu provide biological and chemical solutions for the effluent disposal. Thereby they are looking for the collaboration with foreign partners. Additionally, there are further plans to complete sewage pipelines with a length of 30,000 kilometers.

Waste management and recycling

The rapidly changing habits of consumer's consumption and lifestyle are accompanied by a growing amount of packaging waste. Meanwhile its quantity amounts to 20 percent of the weight and 50 percent of the volume of the solid household waste. Due to an increased environmental aware-



Photo: pixabay

ness of the Turkish population and new legal requirements, which were issued in the course of the planned EU-Integration, proposals regarding waste disposal and recycling will be promoted. Therefore, the ministry for environmental and urban development issued a comprising enactment regarding the disposal management of waste and waste water (government gazette „Resmi Gazete“ No. 29314 April, 2nd 2015).

According to the department of statistics (Türkiye İstatistik Kurumu – TÜİK), 28 million tons of waste were collected and disposed of in 1,391 Turkish cities and municipalities (a population of 71 million) in 2014. The lion's share (18 million tons) went to organized and professional landfills. However, almost 10 million tons of the garbage went to city-owned landfills. 126,485

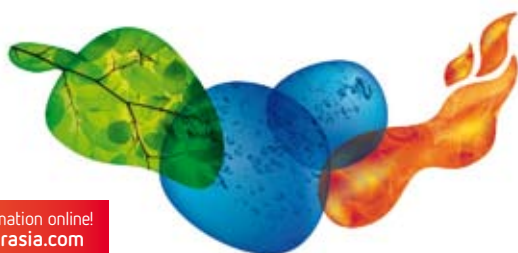
tons of organic material was transformed into compost in appropriate facilities. 15.7 million tons of waste was produced in the processing industry – among them also 1.0 million tons of hazardous substances.

According to the Turkish statistic, 5 percent of the total waste is recycled. Some 45 percent of the waste was sold or transferred to licensed waste disposal and waste processing companies. About 31 percent went to organized landfills. Furthermore, the remaining waste was disposed of in incineration sites.

The environmental expenditure reached about 7.13 billion US-Dollar in 2014 and corresponded to about 1.2 percent of the gross domestic product. About three quarters of the expenditure went to the state.



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“We are relying on Methods, which are no longer contemporary”

A plea for a restart of the European recycling economy by Dr. Heribert Gisch, former managing director of the waste disposal association Saar (EVS).

It has been a story of success so far: The first initiatives to reform waste management began in the late 1980s and since then it has changed fundamentally, specifically in Middle and Northern Europe. The outstanding result of this development is the fact that the disposal of waste has predominantly come to an end. The leading role of the mid-European states regarding waste management has now become the blueprint for the European waste strategy. But is this strategy really target-aimed and is it possible to transfer this strategy to eastern European countries, where waste economical concepts are still at the very beginning and where 80 percent of waste is still deposited? Is it possible to realize a circular economy in all EU states equally? As is generally known, the European Waste Framework Directive is characterized by the definition of binding targets and their significance (avoidance, reuse, recycling, utilization, disposal), but it is not characterized by methods and techniques for the implementation. For financial reasons this framework encourages creativity, diversity and flexibility regarding the configuration of national and regional waste management schemes.

The EU administration is well-advised to abstain. The administration should rather examine whether and to which extent and at what level of quality the strategic objectives can be implemented in a national and regional context. The EU administration's current focusing on the household-related separate collection with the various collection systems completely ignores the specific starting situation and the basic conditions in which the today's system in Germany with division of tasks between private and public economy has been developed. A household-related separate collection takes years, if not tens of years, to be established on an overall basis due to a fundamental change in the population's behavior.

A significant example of the partially persistent acceptance problems in Germany is the separate collection of organic waste, which was implemented nationwide as recently as January the 1st 2015. But the resistance is still emerging. Is

it possible that such a construction process can set a pattern throughout Europe? If such problems already occur in Middle Europe, where the population's mindset is positive towards separate collection, major problems should be expected in other European countries and regions with completely different mindsets. Therefore, there are reasonable doubts, as to whether we have the time for such a construction and development process in countries like Eastern, Middle Eastern and South Eastern Europe, which are still developing their waste management - notwithstanding the deadlines, which are arranged in the particular EU adhesion contracts. Furthermore, considering a population that is largely non-sensitive towards waste management coupled with rampant indifference shown by those who are politically responsible, there are doubts whether we can expect the stringency necessary to bring about a prompt change in attitude and mentality that would be required to implement the largely unpopular measures.

The same standards – is it fair?

The current position of the EU administration ignores the completely varied starting situations and economic parameters of the member countries – such as: whether a waste management concept is implemented in a densely or sparsely populated or if it is implemented in a structurally weak or strong region. Moreover, separate collection systems are cost-intensive. A key criterion will be the answer to the question, which charges are appropriate and enforceable for a low median household income. Therefore, is it fair that the EU demands the same standards of poor states that they demand of rich states? After all, the rich states did have the possibility to develop those standards under much better conditions.

Furthermore, the range of variation and the prioritization of national and regional waste management concepts are ignored as well. Thus the Lorrainian Multiflux-Concept indeed separates refuse into three different plastic bags (Recyclables, Biodéchets, Résiduels), fails however to fur-

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ther separate the Recyclables – paper from plastic and metal packaging. The focus of this system is a significant reduction in the high logistic costs involved in the cycle of collecting and emptying rubbish bins. Poland is a good example showing that a country does not necessarily have to correspond to the ideal goals of a recycling economy, but by increasingly focusing on garbage incineration and energetic incineration respectively, it fulfills the minimum requirement of the EU directive.

It is remarkable how and with which idealized and uncritical view the German separate collection is practiced: barely a word being said about the problems and disadvantages. However, also the drawbacks should also be acknowledged and assessed in order to envision the separate collection practice in its sober entirety. The truth is that separate collection results in high logistic costs and each additional separate collection of an additional waste fraction imply an increase in costs. The implementation of an additional recycling bin in Germany is highly debatable. Especially as soon as impact and costs are compared to each other. It is not difficult to imagine in which way these massive costs affect rural regions and thereby impact large sections of eastern middle Europe.

An exhausted system

It is also true to say that the system becomes more complex as well as accident-and-error-prone with every additional separate fraction. Many practitioners are absolutely aware of the littering problems on container collection points, which occur every day. Furthermore, it should be noted that the recycling rate of municipal solid waste stagnates. It seems that the limit is at 60 to 65 percent, which is difficult to overcome. The limit for organic waste is at 50 percent. Even fee incentives, awareness campaigns, etc. cannot increase this percentage. The system based on the willingness and ability of the population to actively participate in waste separation has obviously been exhausted, even under the most optimal conditions.

Another desirable increase of the success rate is unachievable with the existing system due to its complexity and expensiveness.

There is another related central problem of separate collection, which is largely disregarded: the problem of “mishthrows” regarding packaging waste. In Germany, this is a permanent issue between private dual systems and disposal co-operations, which are regulated by public law. Disillusioning tendencies can be identified; even if only a few convincing and representative final figures are available:

- The amount of “mishthrows” regarding the yellow refuse bin/yellow bag (residual waste, organic waste etc.) is circa 50 percent average
- The amount of “mishthrows” of packaging waste respectively organic waste regarding the residual waste ton amounts to 40 and 50 percent
- The amount of “mishthrows” regarding organic waste and therefore regarding the green ton (packaging waste, residual waste) is circa 20 to 30 percent.

Those results can be subjected to variation depending on local parameters (level of charges, fee incentives, etc.) but this does not challenge the basic tendency. According to a survey of the Association of Municipal Companies (VKU), the stake of the material recycling of plastic amounts to solely 20 percent – an oath of manifestation.

What happens after “mishthrows”? The amount of waste has to be post treated in industrial re-sorting and/or in combustion. Both options require considerable additional costs, which is hardly systematically recorded by anybody and therefore those costs are more or less “hidden” in the total account. Does it make sense to maintain such a system permanently respectively impose this system on everybody else? A separation system has been created with humungous effort, that in all honesty has proven itself to be inadequate requiring counter, repair measures.

What would be more sustainable?

There is a central problem regarding household-related separate collection: We entrust the quality of household-related separate collection respectively the functioning of the total system to the population’s willingness and their ability respectively. Be it due to indignation and or ignorance; on the bottom line, separate collection has proven extremely unprofessional and non-sustainable. But if we are looking for higher professionalism of waste separation and thus an increase of the recycling rates, then the question arises, why do we not rely on industrial processes from the beginning. Meanwhile, the corresponding techniques are highly advanced: household mixed waste can be separated into comparable clean fractions, which are adapted for the material utilization – at much cheaper costs.

It must be more target-aimed and sustainable to set the priorities there instead of making circuits, which will prove themselves as less resilient in the long run and out of reach for European realities. Look carefully at our surroundings: Soon we will drive around with self-driving cars and robots are replacing more and more human beings in our industries. However, in the recycling industry, we are relying on methods, which are not contemporary anymore. It may be the case that the household-related separate collection has established itself in parts of (Middle)-Europe. Furthermore, it is going to be difficult to change this in the foreseeable future. But one thing is for sure: separate collection is not qualified as a future model.



Photo: pixabay

An Efficient Solution for Mixed Waste

The new technology developed by the Croatian company Tehnix enables circular economy.

"It completely fulfills the Brussels policy related to a promotion and achieving of circular economy," the company underlines. "The decisions of the European Commission for the environment are going to order new technologies." Due to 20 years of research and development, the company Tehnix has generated an eco-technology which is able to deliver mixed municipal waste completely recycled on an industrial way to the value chains. It can be installed in standard factories.

The previous practice of primary selection by hand fully fits and complements the new project, Tehnix emphasizes. Municipal waste is "the largest Croatian, European and global problem, the results so far are insufficient". This is why the company and myself have explored and developed the best technology, which allows the complete recycling of mixed municipal waste to reusable materials.

A great theoretical knowledge used for development of new products and equipment, which make one technological industrial unit, enables waste selection into three segments for re-

use in the industry. Factory recycling obtains 8 types of pure raw materials which return to the industry as feed-stock. Raw materials obtained from industrial recycling are clean, rapidly usable, baled and two times cheaper. The industrial selection enables faster, cheaper and a more sustainable development of national and global industry.

The new "MBT-Te" technology

The company Tehnix has developed new machines, that are not manufactured yet, and they make a fundamental value of the performance possibilities of industrial recycling that can be implemented anywhere around the world. By applying new technology, the world will be able to continue an industrial development without compromises.

I would like to explain very briefly why environmental policy must accompany those technologies, which achieve the objectives of circular economy on the fastest and most thorough way. Any theory is as good as it is confirmed by practice and the best re-

sults. A discovery of the new "MBT-Te" technology is a solution that provides economic, ecological and social development.

MT = industrial mechanical treatment on an industrial scale enables a selection of eight types of industrial raw materials.

BT = biological aerobic treatment of organic waste enables the production of eco-compost in two months.

Te = the rest of combustible waste is dried, shredded and baled as RDF fuel, ideal for cement production.

As part of our standard, the plants realize environmental protection measures to prevent further contamination of the environment. Every plant is mobile, prefabricated, portable, environmentally friendly and can be completely recycled. Our factories for industrial recycling are ideal for touristic areas, cities, municipalities, and states. It takes up little space in any location and it is perfect for existing landfills due to recovery.

By applying and construction of Tehnix factories, waste becomes an economic resource. The life time of our plants is at least 50 years and the total investment is amortized within 5 years. This is a technological discovery which allows that people are paying less and the state spends less money. Additionally, there is no failed investment. Furthermore, it simplifies the monitoring by state institutions as well as experts of the European Union. We achieve sustainable development, which does not have an alternative for a secure future on a faster and cheaper way. So far we have built almost 48 plants of various capacities of waste recycling in tons / hour. The most important thing is to develop a high quality conceptual technological and construction project with lasting functionality.

By using MT-BT-Te from Tehnix we get more raw materials, more energy and more jobs. If the world wants further



Photos: Tehnix



Awarding of Oscar to the president of the company Tehnix, Mr. Đuro Horvat, for nomination at the world competition "EY – Entrepreneur Of The Year" in Monaco / Monte Carlo 07th-12th June 2016

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and sustainable development, the new MBT-Te technologies should be used. We would like to provide the Ministry of Environment and Nature Protection of the Republic of Croatia, and all the countries of Europe and all over the world with our technological discovery regardless of our patents. It is and it will be a major step that would lead to a sustainable future and achieve the goals of circular economy.

Tehnix – a highly accredited company

The company Tehnix and I received international awards and prizes, I received awards from around the world, I became EY Entrepreneur of the world thanks to the achievements in the environmental protection. Every month European countries and the world are looking for our technological breakthroughs, because they have no choice in the current approach as they are surrounded by garbage and

stench, which by the application of Tehnix technology becomes a huge economic resource of the world, without pollution of earth, air and water. The company Tehnix was established 25 years ago, we have developed over 375 machines and equipment which are directly or indirectly in the function of protection of the planet Earth.

The first international technological conference

The First International Technological Conference for the sustainable management of municipal waste and other waste was organized by Tehnix and took place from 27th to 29th September 2016. Based on lectures, discussions and practical demonstrations of a range of technological solutions of the company Tehnix, over 100 conference participants adopted the decisions with which they want to help the Ministry of Environmental Protection, the Environmental Pro-

tection and Energy Efficiency Fund, other relevant institutions, as well as units of local government, in solving the problem of waste management in a sustainable way – and in accordance with waste management plans of Croatia and commitments from EU directives about circular economy.

The participants of the first international technological conference assessed the presentation of new equipment developed by Tehnix as very positive. This could contribute to a sustainable development in the Republic of Croatia and the global market as well as to the reduction of climate changes and to achieving the goals of circular economy. It is certain that our newest technological discoveries will make the world permanently sustainable.

Author: Đuro Horvat,
CEO of Tehnix d.o.o.
☞ www.tehnix.hr





**TEHNIX MBT-T TECHNOLOGY
FOR SUSTAINABLE MANAGEMENT WITH MUNICIPAL WASTE
WE ARE LEADING ECO INDUSTRY FOR RECYCLING
WE DEVELOPED NEW TEHNIX TECHNOLOGY
FOR SUSTAINABLE MUNICIPAL WASTE MANAGEMENT
„CIRCULAR ECONOMY”**

**MUNICIPAL WASTE IS GREAT ECONOMICAL ESOURCE
TECHNOLOGY MBT-T TEHNIX**

Tehnix MBT-T INNOVATIVE TECHNOLOGY IN WASTE MANAGEMENT

MODERN STANDARD FACTORIES FOR TREATMENT OF MIXED MUNICIPAL WASTE
RECYCLING CAPACITY UP
5 – 10 – 15 – 20 – 40 t/h
WE HAVE BUILT 20 FACTORIES



MBT-T
THE RIGHT SOLUTION OF ECOLOGICAL PROBLEM FOR CITIZENS NATURE INDUSTRY

1. FACILITY FOR RECYCLING OF MIXED MUNICIPAL WASTE
2. LINE FOR PRODUCTION, AMBROSING AND BAKING OF RDF FUEL
3. FACILITY FOR BIODEGRADABLE WASTE TREATMENT AND PRODUCTION OF ECO-COMPOST
4. RECYCLING YARD FOR RECYCLED MATERIAL AND REUSE OF WASTE
5. SOLAR POWER PLANT WITH INSTALLATION ON THE ROOF OF THE FACILITY
OUR MBT-T PROJECTS ARE SUPPORTED AND FINANCED BY EUROPEAN UNION AND 1 WORLD BANK



**ECONOMICAL - SUSTAINABLE RESOURCE
ECOLOGICAL - THERE ARE NO NEW LANDFILLS
SOCIAL - NEW WORKING PLACES**



**WASTE MUST BE RECYCLED!
MOREOVER, AS QUICKLY AS POSSIBLE, AS CHEAPLY!**

WE DEVELOPED STANDARD FACTORIES FOR INDUSTRIAL WASTE RECYCLING

MT = MECHANICAL WASTE TREATMENT – INDUSTRIAL RECYCLING
BT = BIOLOGICAL TREATMENT OF BIODEGRADABLE AND GREEN WASTE
TT = PRODUCTION OF RDF FUEL – THERMAL ENERGY

INDUSTRIAL RECYCLING OF MUNICIPAL WASTE ACHIEVES „ZERO WASTE“ = CIRCULAR ECONOMY
IT IS A TECHNOLOGY OF THE FUTURE FOR MUNICIPAL WASTE DEVELOPED IN THE COMPANY TEHNIX IN REPUBLIC OF CROATIA

A Waste-Schengen Zone: Rather a Dream Than Reality

The European Commission has published its final report on “The efficient functioning of waste markets in the European Union – legislative and policy options”. The report focuses on the extent of obstacles and regulatory failures affecting the functioning of waste markets for recovery and recycling in the EU. Among the proposals for possible solutions, the paper suggests the development of a “Waste-Schengen zone”.

In context of the report, a public stakeholder consultation took place and resulted in around 250 replies from mainly organizations and trade associations. It showed that 92 percent consider that there are regulatory failures or obstacles currently affecting the functioning of EU waste markets. Several of the Waste Shipment Regulation’s rules were perceived as obstacles, e.g. the notification requirements and provisions concerning shipments through transit countries. The capacities for waste treatment, differing taxes or fees, and non-harmonization of Extended Producer Responsibility schemes were also cited as main problems for waste markets. Other main gaps that were identified concerned the lack of a Europe-wide enforcement of waste legislation and the lack of a policy that either bans or severely discourages landfilling.

Free movement of waste

According to the paper, the Waste Shipment Regulation’s notification requirements create heavy administrative burden and costs for recycling businesses, as identified during

the stakeholder consultation and research conducted within this study. A solution could be to develop a “Waste-Schengen zone”, i.e. a zone without administrative burden, ensuring free movement of waste for recovery and recycling to environmentally sound facilities in Member States, combined with stringent controls at the borders of this zone. In practice, it would mean abolishing the notification requirements for waste for recovery and recycling within the EU. The most effective option would be to include all currently notifiable waste (hazardous, unlisted and mixed municipal waste) in the “Waste-Schengen zone”

The practical proposals include:

- Assess the material and geographical scope of a “Waste-Schengen zone”.
- Amend Articles 3 etc. of the WSR, and require application of the general information requirement of article 18 and Annex VII for shipments of all waste for recovery and recycling between Member States.

To avoid negative side effects:

- Ensure traceability and adequate environmental safeguards.
- Ensure Environmentally Sound Management (ESM) of waste by taking appropriate inspection and enforcement measures for which Member States’ implementation of Regulation 660/2014 on shipments of waste will be a key factor.
- Assess the relationship with international requirements like Basel Convention.

Only at same level of ESM

Katie Olley, a Senior Environment Protection Officer at the Scottish Environment Protection Agency (SEPA), considered “that some bilateral agreements between Member States already exist if the authorities agree that both (or more) countries have the same level of ESM, and the environ-

mental impact would not be reduced”. But it would be a long way to go since the waste treatment operations vary greatly between the Member States. A waste Schengen should only be created “under very strict conditions of real-world equal Environmentally Sound Management”. Then a facilitating administration might be appropriate. But she confined: “In addition, even with intra-EU shipments, the waste is sometimes ultimately going outside the EU. In this case, a waste Schengen would put pressure on the exit points of such a zone.”

A never ending task?

During the interviews, a stakeholder was asked whether it is desirable to create a Schengen market for waste. He answered: “Yes, because open markets are better than closed ones. But this makes the law even more relevant as waste can then move freely (same as in goods), you need to level the playing field – but this is a never ending task.”

A “Waste-Schengen zone” might be imaginable as a zone without administrative burden and a free movement of waste between specific Member States, combined with more stringent controls at the borders of this zone. So the report comes to the conclusion: “In sum, a ‘Waste-Schengen zone’ without administrative burden between specific Member States could overcome the problem of red tape, if combined with a guaranteed high level of environmental performance on waste treatment within these Member States and thus no leakage towards the lowest performing and cheapest solution. However, at this moment, this seems to be rather a dream than reality.”

The full report can be downloaded from ➡ http://ec.europa.eu/environment/waste/studies/pdf/waste_market_study.pdf



Ghana Gets Support to Recycle E-Waste

On the occasion of the 5th edition of the West African Clean Energy & Environment Exhibition & Conference (WACEE), which took place from 13 to 15 September this year at the Accra International Conference Center in Ghana, there was good news for the recycling sector of the country.

Germany has earmarked 20 million Euro to support Ghana to set up an electronic waste recycling facility, the German Ambassador to Ghana, Christoph Retzlaff, announced at the opening. With regard to the Government of Ghana on passing the "Hazardous and Electronic Waste Law", which will translate the relevant Basel convention into national law, he stated that the country would be "the frontrunner in Africa". In addition, Germany has pledged 5 million Euro on a program focused on improving working conditions for workers dismantling electronic waste and establishing a

collection center at Agbogbloshie. The Agbogbloshie scrap metal site in Accra is Ghana's largest center for electronic waste (e-waste) recycling and disposal.

In 2010, Blacksmith Institute (now Pure Earth, an US-based international NGO), in partnership with GreenAd Ghana, the Ghana Health Service, and the City University of New York School of Public Health conducted an assessment of the occupational and environmental exposures of electronic waste recyclers at Agbogbloshie Market. According to Pure Earth, the research

produced comprehensive documentation that e-waste processing, especially the burning of copper wires, exposes workers, local residents and family members to hazardous levels of heavy trace elements. In January 2014 began a pilot project started by setting up a basic e-waste recycling facility that would enable recyclers to stop burning wire and instead strip it in a way that was efficient and profitable. During stage 2 of the project, from October 2014 to June 30, 2015, further machines were purchased and more workers were trained. The project has been extended into 2016.

Global Solid Waste Management Market: Strong Growth up to 2023

US-based market research and consulting service provider Global Market Insights Inc. predicts that the worldwide solid waste management market will grow at a compound annual growth rate (CAGR) of over 8.5 percent and hit 300 billion US-Dollar by 2023.

The solid waste management industry is characterized by stringent government regulations pertaining to MSW management and efficient implementation including reuse, recycling, reduce and recovery methods. According to the American Environmental Protection Agency (EPA), the U.S. generated over 250 million tons of waste, with a recycling rate of about 34 percent, the company gave account. Rapid urbanization and increasing consumption level of resources such as paper, plastic, edibles and textiles were expected to double the municipal solid waste (MSW) over the forecast period. Australia's market size was estimated at over 7 billion US-Dollar in 2015 and is supposed to reach more than 9 billion US-Dollar by 2023.

Also in Europe there will be no demand shortfall, the company predicts. And Asian countries such as China and India are anticipated to experience significant demand due to increase in population and government initiatives to ensure healthy environment in the region. Huge initial investment costs were likely to restrain growth in the Middle East & Africa solid waste management market.

The Global Market Insights Inc. takes also the view that recycling is an "effective and efficient solid waste management market technique, increasing environmental concerns coupled with lack of resource availability is likely to propel demand for this practice. Organic material was the leading contributor in this segment followed by newspaper or mechanical paper." Increasing government regulations accompanied by a rising sustainable development trend would be expected to fuel growth. "However, huge processing and recycling plants costs and low priced substitute such as inexpensive landfilling is likely to be a restraint," the company states.

The report is titled "Solid Waste Management Market Size, Industry Analysis Report, Regional Outlook, Application Development Potential, Price Trend, Competitive Market Share & Forecast, 2016 – 2023". Request for an in-depth table of contents is available at www.gminsights.com/request-toc/upcoming/265.



Photo: BMU / transi / Härtlich



Russia: There Will Be a Change

In 2017 the planned ecology duty will become payable. According to the opinion of Russia's president Vladimir Putin, the money could help to construct waste recycling plants, the Russian news agency TASS reported some months ago.

According to the provided information, he has ordered the organization called "All-Russia People's Front"*) to control the situation with recycling, because he is concerned about the quantities of not recycled waste in Russia. In addition, Putin thinks this sphere is "criminalized".

Enormous market potential

On the one hand, Russia is the largest territorial state on earth (about 177 million square kilometers), but on the other hand it is one of the least populated countries (about 144 million inhabitants). However, the Russian amount of industry and household garbage is gigantic compared to other nations. According to the national Court of Auditors, waste in Russia, respectively in the Russian Federation, amounts to 90 billion tons per year. Household garbage has a share of solely 2.3 percent.

A current disposal method is the deposition on landfills. According to Greenpeace Russia, the landfill area should cover 41,000 square kilometers. According to specialist media, there are about 1,000 legal landfills as well as

15,000 authorized waste deposits. Furthermore, there shall be about 30,000 illegal landfills.

According to the information, 40 percent of industrial waste and 10 percent of household garbage are disposed of in an environmentally friendly manner. For this purpose over 50 large facilities for waste separation and sorting, about 240 facilities for processing of waste and 40 incineration plants were available in 2013. It was only a matter of time until measures have been taken to overcome the waste problem due to the fact that the Russian amount of waste is said to increase annually by around 5 billion tons.

Legal bases

Heretofore there has been a lack of legal conditions. According to Germany Trade and Invest, the economic development agency of the Federal Republic of Germany (GTAI), the Russian law on the protection of the environment from 2007 and the law on production waste and household garbage from 1998 had to be revised. The revision has already taken place in late 2014.

Related to the novella of the environmental law, importers and producers of consumer products should set up a fee in the amount of 1.5 to 4.5 percent calculated from the

*) This Front is intended to be a coalition between the ruling party and numerous nongovernmental organizations. In June 2013 Putin was elected as its leader.

Sanctions Imposed on Russia

The European Union and the United States of America imposed restrictive sanctions on the Russian Federation in 2014 in reaction to Russia's annexation of the Crimea and the deliberate destabilization of an independent neighboring country. In July 2016 the EU extended the sanctions until January, 31st 2017. The sanctions are aiming for parts of the Russian economy. In return Russia imposed sanctions on the EU and the USA.

value of the goods or alternatively establish a return and a waste management system or task an external company to perform this function.

The implementation of the law was postponed to the beginning of 2017 due to the poor economic situation; the fight against recession and inflation had priority. According to the online-publication "Russia Beyond the Headlines" (RBTH), new amendments to the federal law "On Production and Consumption Waste" took effect on September 26th 2016. "Each region will have to decide how to deal with waste – to sort and recycle it, send it to a landfill, or incinerate it", RBTH reported. "Federal Funding will depend on the implementation of such programs."

Favorable economic situation

So far investments in environmental technology have barely been made due to the economic crisis and especially due to the fact that regions, cities and municipalities had to deal with financing problems. However, the situation seems to be improving. According to the Russian Central Bank's opinion, the decrease of the economic growth in 2016 is considerably less severe compared to the previous year. Furthermore, the monetary authorities assume that the import of investment goods will rise again, the inflation will decrease and that the Russian Ruble will be less volatile. The Central Bank expects an increase of imports of investment goods, which is likely to continue in 2017 based on the current trends. This development is supported by the rate of the Ruble, which staggers less meanwhile. The contribution of exports to the growth of the gross domestic product will subside up to and including 2018.

Investments

According to experts, the Russian waste management will evolve into a multi-billion dollar business as a few examples show. Therefore, 15 new thermal power plants will be created in the Moscow area, which will use solid waste

as fuel. Hereby the deposited volume of waste will shrink by 80 percent. A respective agreement was made among the Moscow area and a joint venture of the state holding company Rostec as well as the Japanese-Swiss company Hitachi Zosen Inova in 2015. There are plans to develop a system, which is adapted to the local conditions, for the garbage collection and transportation for the provision of the generating plant with fuels.

The waste management shall be modernized in the Russian Far East as well. A total of 23 sites for the compressing of communal waste with subsequent land-filling are planned to be set up by 2020. Chabarowsk will be the central location for the extraction of secondary raw materials from communal waste, according to GTAI. According to the development and operating company for environmental projects, OAO UK Eco-System, 24.5 million cubic meter waste accrues annually in the Russian Far East.

Projects for plastics recycling

Eco-System intends to build a facility for plastic waste in Chabarowsk (near the border to China) from 2017 until 2019. The project is worth more than 30 million US-Dollar. The profitability of the facility would be given if at least 100 tons plastic waste (particularly from PET) are processed and worked up to secondary raw materials per year.

The reason for selecting the regional "Territory of the accelerated social and economical development" (TOR) is to save taxes. The ministry for the development of the Russian Far East establishes via its subordinated development company nine territories in total in the Far East of Russia and one free harbor in Wladiwostok, according to GTAI information.

After the realization of the project, Eco-Systems plans further facilities for the processing of aluminum and glass waste as well as recovered paper. However, the problem of selling future arising secondary raw materials is still unresolved. At the moment there are no commercial customers

Sorting Plant to Be Built in Rostov Region

Within the framework of the International Economic Forum in Saint Petersburg, a deal on the construction of a unique environment-friendly unit was signed in June this year. It is intended to build a facility for sorting and processing of solid municipal and industrial wastes in the Volgodonsk district, located in the Rostov region of Russia. The project also includes a landfill site for irreclaimable wastes, optimization of a logistic scheme for wastes collection and transportation, as well as the construction of a waste transfer station, the Russian online journal construction.ru reported in June this year. Investments are estimated at nearly 15 million US-Dollar. Half of the sum will be allocated from the local budget, the rest will be financed by the investor.

in the Russian Far East, but experts are already monitoring possible markets in the People's Republic of China.

Financing from public and private sources

According to the provided information, the federal law about "Public-Private Partnerships" became applicable in Russia in January 2016. Thus, this financing possibility is also an available option. Additionally, the Russian regions have an own PPP-regulation available. Furthermore, the federal legislation permits awarding concessions by the public authorities at all level of administration, including regions and municipal ties. It will be jointly funded by municipal and regional administrations as well as by the fund for the development of the Far East and the Baikal-region (russ.: FRDW); its sole shareholder is the Vneshekon-

Useful Links:

Integrated Foreign Economic Information Portal

➔ <http://www.ved.gov.ru/eng/>

Russian Investment Agency

➔ <http://www.investment-in-russia.com/>

Invest in Russia

➔ <http://www.invest-rf.com/>

bank (VEB), a state-owned bank for development and foreign trade.

The operating company for environmental projects OAO UK Eco-System and the FRDW are the points of contact regarding projects in this region.

Tula: New Landfill

According to media reports, a new solid waste landfill will be constructed near the Russian city of Tula which will be in compliance with all ecological norms and regulations. The wastes from Tula, the Leningrad district and Schekino will be brought there. It is intended that waste treatment facilities will also be built at the landfill which is designed to bury 360,000 tons of wastes. As reported, its lifespan is 16 years.

Sustainable Phosphorus Use

Recycling waste from farming and mining could help improve the sustainable use of phosphorus, a recent study suggests. The researchers traced the stocks and flows of phosphorus over a 50 year period to reveal changing patterns of global phosphorus use.

The study evaluated the past global supply, demand and depletion of phosphorus resources and modelled the global stocks and flows of phosphorus from 1961 to 2013 using data from a range of sources.

The result: Over the five decades, the amount of phosphorus extracted from phosphate rock rose by over four times, from 14.6 teragrams or 14.6 million tons of phosphorus (Tg P) in 1961 to 68.7 Tg P in 2013. Most of this increase is related to producing mineral phosphorus fertilisers. Furthermore, the study found out, that the demand for animal products increased at a higher rate than the global demand for phosphorus over the study period.

The source of agricultural phosphorus has also changed: In 1961, 29 percent of phosphorus requirements for global croplands and grasslands came from mineral fertilisers, while 56 percent was derived organically, from manures, crop residues and human

excrement. By 2013, 56 percent of agricultural phosphorus inputs came from mineral fertilisers, while 38 percent came from organic sources.

The researchers suggest changes to sustainably manage phosphorus resources. A return to recycling farm organic waste would significantly improve the sustainable use of phosphorus. Careful management would be needed to ensure only sufficient phosphorus is applied and retained, so that surplus phosphorus does not pollute water through run-off, leaching or soil erosion.



Improved soil conservation practices, particularly in Europe and the United States, have already resulted in a significant reduction in phosphorus reaching the water environment. In 1961, 90 percent of global phosphorus water pollution was from agricultural land. By 2013, this source accounted for 28.5 percent of phosphorus water pollution. Waste from agricultural production increased from 9.8 Tg P in 1961 to 20.7 Tg P in 2013, although its relative contribution dropped from 45.9 percent to 28.5 percent.

Waste from mining phosphate rock contributed just 3 percent of phosphorus water pollution in 1961, and 62 percent in 2013. Mining waste was also responsible for 50 percent of phosphorus wastes from all sources in 2013. So recycling waste streams would improve the efficiency of phosphorus use, although the researchers point out that the number of impurities and low concentration of phosphorus in mining waste make its recovery more challenging.

Photo: Fraunhofer IFF



Cuba's Recycling Industry: Slowly Requested by Foreign Investors

In 2007, the comprehensive “Study on Integrated Management Plan Final Report of Municipal Solid Waste in Havana City” put it to the point: “The recycling activity in Cuba is being fully managed and controlled by UERMP (Association of Enterprises for the Recovery of Raw Materials) [...]. The recyclables are presently collected and sold to markets solely by UERMP.”

Figures from 2003 show that ferrous scrap recovered in Havana comprised to 2,335 tons, aluminum 84 tons, glass 127 tons, plastic 119 tons, lead 100 tons, while paper and cardboard reached 369 tons. The recovered iron and steel was processed and turned to new metal structures, non-ferrous metals were consumed in non-ferrous foundries, paper was used to replace virgin pulp, and glass containers were simply refilled.

A complex scrap problem

On the other hand, “the directives for waste management in Cuba are mostly vaguely defined and integrated into other decrees what makes them confusing. As a consequence of this insufficient implementation of a sustainable ecological dimension into economical development plans there is no integrative management program for municipal waste countrywide”, an expert from the Havana waste disposal company is cited. The German postgraduate Thomas Amerl summarized the situation: “The complex scrap prob-

lem of Havana reflects the relationship between Cuba's economic crisis and its ecological consequences. The storage of waste in the households, its removal and final disposal on landfills is of importance, because processing, recovery and utilization of waste does not exist, with very few exceptions.” It was estimated that 72 percent of the regional waste derived from households, the remainder from different institutions, trade and industry.

Encouraging increased recycling

The tide changed in December 2011. The Council of Ministers approved Article 235 of Cuba's recycling policy – as part of the implementation of guidelines drawn up during the 6th Congress of the Cuban Communist Party – aiming at “encouraging increased recycling and added value of recovered products, prioritizing activities of greater economic impact and fewer resources and their re-capitalization, as permitted by the economy”. According to The Cuban Handshake online-magazine, this started an era of

reviewing the performance of the recycling sector, renewing the appropriate law and setting prices.

In July 2014, first results were available on the country's potential output of recycling materials, the installed capacity for industrial processing and the opportunities that the sector can offer foreign investors to create new recycling capacities. The figures not only gave cause to the planning of a local ship disassembling plant and a new recycling plant of plastic materials. They also showed the need of new plant equipment to disassemble large and idle industrial facilities for the treatment of metal scrap.

Exporting or selling to the local market

At that time, the Cuban recycling sector still acted insufficient and unsystematic, nonetheless it saved 120 million US-Dollar by exporting or selling to the local market 420,000 tons of recycling material like steel, iron, bronze, aluminum, paper, plastics, textiles and e-scrap. This was not at least the merit of pilot projects in Artemisa, Mayabeque and Camaguey, where recycling was partly taken over by the private sector: Mostly the governmental cooperative dealt with purchasing and selling of the material that was – stipulated by contract – collected by self-dependent employees. According to Granma, the Official Voice of the Communist Party of the Cuban Central Committee, the Artemisa company surpassed its targets in the first half of the year by 20 percent and recovered over 13,600 tons of raw materials. Rum and beer bottles, paper, cardboard, aluminum, copper, sacks, medicine bottles, lead batteries, scrap steel and cast iron were and are the recyclables destined for the domestic industry, among others. Meanwhile, copper, aluminum, stainless steel, bronze and electronic scraps are destined for export, marketed by the Equipment Dismantling Company.

Need of biogas plants

Opposite to recyclable waste, the general treatment of organic and biodegradable matter – comprising minimum 50 percent of the municipal solid waste – stayed in dispute. In 2008, scientists suggested in a study a theoretical amount of organic waste reaching 1 million tons per year, leading to the production of about 0.5 million tons of compost every year. Composting was then estimated as the "suitable solution" for the organic fractions of municipal solid waste. In 2014, another comprehensive study analyzed a number of waste-to-energy technologies and found a combination of dry anaerobic digestion with biogas capture and gasification to be the best. By anaerobic digestion, the bio-generator could obtain biogas from the biodegradable fraction, followed by two different processes: one stream recovered by a composting process, the other pretreated for recovery and recycling of materials and then sent to a gasification plant.

However: Cuba then discovered a great demand for the treatment of organic waste. In June 2015, the online-magazine E&E news reported Cuba having 1,818 biogas digesters and a need of additional 7,000. And the vice minister of the Ministry of Energy and Mines, Raúl García Barreiro, un-

derlined the general need of "500 industrial-sized biogas plants using the residue of distilleries, canning factories, sugar mills, slaughterhouses and pulping factories".

Opportunities for foreign investment

In November 2014, the Cuban Minister for Foreign Trade and Investment, Rodrigo Malmierca, provided a list of 246 projects looking for foreign financiers. According to him, all ventures included some sort of feasibility studies to ease the transaction. But the investors stayed expectant, especially as the capital expenditure requirements were partially unclear. In contrast, the official "Cuba Portfolio of Opportunities for Foreign Investment 2015" offering "Cuba: A Place for Foreign Investment" marked a further step to market opening. Concerning main products for the domestic and export markets, the paper had to admit that Cuba is "distinguished by our comprehensive system of recycling scrap metal and non-metal waste that adds value and allows us to reduce the costs of our products". But it "invites foreign investment to develop and update its technology and to achieve productivity and competition levels for its products according to international standards and thereby increase its exports".

The "portfolio" offered even more. The "metal / mechanical business group" consisting of the three fundamental sectors – metalworking, recycling and mechanical/machinery production – was seeking strategic alliances: It is "prioritizing investments associated with steel and container production, products for agriculture, transportation, production and rational use of energy and the manufacture of consumer goods, etc.". And the implementation of a "Solid urban waste handling integrated system" wanted not only to gradually reduce total volumes of generated waste to minimum levels, but also to build plants to generate electricity and heat and produce organic fertilizers – second raw materials for the domestic market. The estimated investment of this joint enterprise: one billion US-Dollar, in the first phase with fixed capital of 401.2 million US-Dollar to be undertaken in Havana.

Growing demand of foreign investors

The demand of foreign investors began to grow. In March 2016, the Swedish Trade & Invest Council reprinted the conditions of the above-mentioned "Solid urban waste handling integrated system" in its "Business Opportunities for Swedish Companies in Cuba". And in June 2016, the Cuban News Agency reported that Cuban authorities were analyzing proposals from 28 foreign companies willing to invest in a management project of urban solid wastes generated in the country. Orlando Lopez, specialist of Industrial Policy Board of the Ministry of Industries, underlined "that the requests for investments came mainly from European nations and Canada".

Cuba seems to have come to a point as The Cuban Handshake has already described in 2012: "The new policy stipulates the development of industrial processing through the introduction of new technology and of course through the encouragement of foreign investment in the sector."

Demand for Copper Could Increase by 213 to 341 Percent

Global demand for copper could increase by up to 341 percent by 2050, and energy use is likely to increase with it – rising to a possible 2.4 percent of global energy demand in 2050, according to new researches. Policy actions to avoid such drastic changes could include improving copper recycling and using renewable technologies.

There are increasing concerns about the future supply of copper. Although copper has been used by human societies for at least 10,000 years, over 95 percent of all copper ever mined has been extracted since 1900 and more than half of the copper ever mined and smelted has been extracted in the last quarter century. Estimates suggest that copper reserves could be depleted in just 25 to 60 years.

More than that: Demand for copper is rising faster than it can be recovered from secondary sources like industrial and consumer waste such as pipes, brass and old electrical appliances and, as a result, reliance on primary copper (which must be mined) is increasing. Mining is extremely energy intensive and one of the biggest contributors to global CO₂ emissions. As demand for copper increases, the quality of its copper ore is expected to decrease; accordingly the energy needed to extract copper will increase further.

To help policymakers to better plan for this future, a new study published in “Global Environmental Change” estimated copper demand, supply and its associated energy use up until 2050. Estimates were given for four different scenarios for the future.

These are:

- **Market First (MF):** A market-driven world in which demographic, economic, environmental and technological trends unfold in line with current trends. This is the ‘business as usual’ scenario.
- **Policy First (PF):** Strong actions are taken by governments to reach specific social and environmental goals (especially regarding renewable energy).
- **Security First (SF):** A world of inequality and conflict due to socio-economic and environmental pressures.
- **Equitability First (EF):** A future of more equitable values and institutions.

Overall, the results suggest that increases in copper demand over the next four decades will be dramatic, with all scenarios requiring substantial increases in copper mining and processing.

Total demand for copper in 2050 was estimated to increase by between 213 percent and 341 percent, compared to 2010. The demand was highest in the ‘EF’ scenario, in which achieving global equity requires significant increases in metal production to meet the needs of the world’s population. Per capita GDP is the highest in this scenario, which is a good predictor of copper demand. The demand was lowest in the ‘SF’ scenario, where regional isolation and lack of income growth prevents an increase in metal use. Demand estimates for the ‘MF’ and ‘PF’ scenarios were both 275 percent, as growth in per capita GDP (on a global level) is the same in the two scenarios.

The demand for copper in all scenarios is expected to exceed copper reserves (amounts that are currently economic to mine) and the reserve base (reserves plus the copper in deposits that are not economic to mine) before 2050. Production is expected

to exceed current reserves earliest in ‘EF’ by 2036, followed by the ‘MF’ and ‘PF’ scenarios by 2038 and then the ‘SF’ scenario by 2040.

Estimates of the energy required for copper primary and secondary production ranged from 0.83 percent (SF) to 2.33 percent (EF) of total global energy required for all societal uses in 2050 – compared to just 0.3 percent today. Although the highest amount of energy was required by the ‘EF’ scenario, this does not necessarily mean the highest CO₂ emissions, as this scenario also has the highest share of renewable technologies.

To mitigate these negative impacts, the researchers recommend that governments encourage mineral research and exploration and provide incentives to increase rates of copper recycling. They also suggest the copper cycle could be made more efficient by reducing losses at all stages, from mining to product manufacture, and recommend reducing the amount of copper used in non-recyclable applications and re-designing existing technologies that include copper. The metal could be partially replaced with graphene, for example, which is also an excellent conductor of electricity.



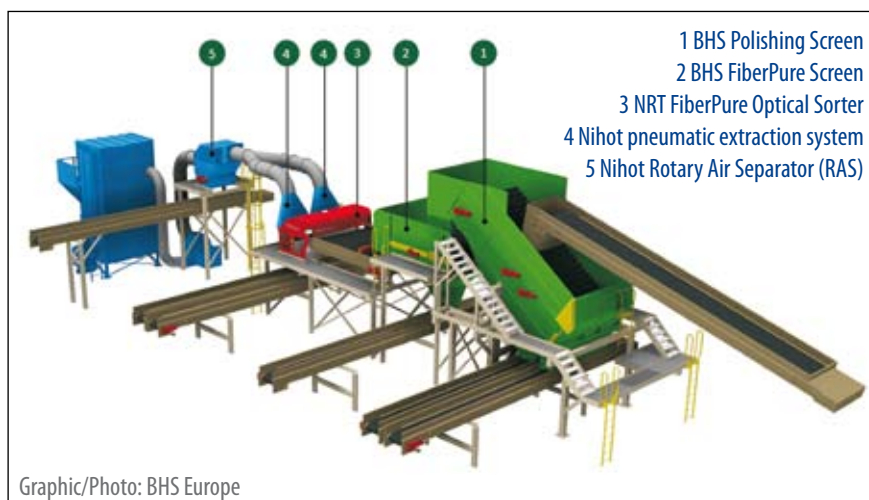
Photo: O. Kiruth

New System for Fiber and Film Sorting

According to Bulk Handling Systems (BHS), there is a way to get pure fibers and films.

An intelligent combination of sensor-based sorting technology and air technology is able to help recycling companies throughout the world “achieve ground-breaking recovery and purity results in some of the most complex and challenging plastics or fiber recycling applications”, the technology provider is convinced. BHS has announced a new plastic film identification and removal system, utilizing NRT’s FiberPure Optical Sorter with the option of a Nihot pneumatic extraction system. This solution could create a one-step approach, enabling operators to better capitalize on the evolving mix of fiber and film than with standalone air or optical equipment. Additionally, it could significantly lower labor costs.

According to the provided information, the combination of the NRT FiberPure Optical Sorter and Nihot air extraction system was designed to fulfill the market’s demand for a technology solution to separate plastic film from high volumes of fiber with high purity rates on both fiber and film. “In this application a stand-alone NRT is capable of detecting and ejecting on film or fiber and creates a high quality split between these materials,” BHS reported. “When the integrated Nihot air extraction system is installed, it will also upgrade the ejected materials with a density split creating an even more pure fiber and film fraction. The combination allows operators to use their existing sorting process for two- or three-dimensional sorting as it is



Graphic/Photo: BHS Europe

easy to retrofit; the Nihot air extraction system can also transport materials to any desired position in the process, making this automated solution an easy retrofit with a fast return on investment.”

The process

From Single Stream to MSW, all 2D material coming from a BHS Polishing Screen is fed to the NRT FiberPure Optical Sorter using the entire width of the acceleration infeed conveyor. By use of an air curtain the material will stabilize on the belt. The NRT is in this case setup to target film depending on the material stream to maximize recovery. This is the optimal point in the BHS operation process for the simultaneous identification of film types followed by the extraction of these materials. The NRT detects and ejects material in flight and the plastic film fraction is aspirated via an

opening above by a Nihot air extraction system. Non-ejected material (i.e. paper) lands on a default conveyor and heavier plastics (such as partially filled plastic bags) are captured in the far chute. At the end of the process the clean plastic film is captured in a Nihot Rotary Air Separator (RAS) which isolates the light material (fractions) from the conveying airflow and discharges the materials into a bay or onto a conveyor.

Industrial application

UK-based waste management company Biffa chose BHS as a partner for adding a specialized 8 tons per hour Glass Clean-Up System and Container Clean-Up System to its existing Materials Recovery Facility (MRF) in Aldridge, UK. As reported, the Container Clean-Up System (featuring a NRT FiberPure Optical Sorter and Nihot air extraction system) paid for itself in just nine months’ time. The sorter removes additional three tons of fiber on an hourly basis from the existing container line, increasing mixed paper recovery as well as the purity of containers with the result that the container line manual sorting was significantly reduced. Based on the results of the Aldridge facility the company has ordered a second NRT sorter to upgrade their Edmonton facility as well.



- ➔ www.bulkhandlingsystems.com
- ➔ www.nrtsorters.com
- ➔ www.nihot.nl

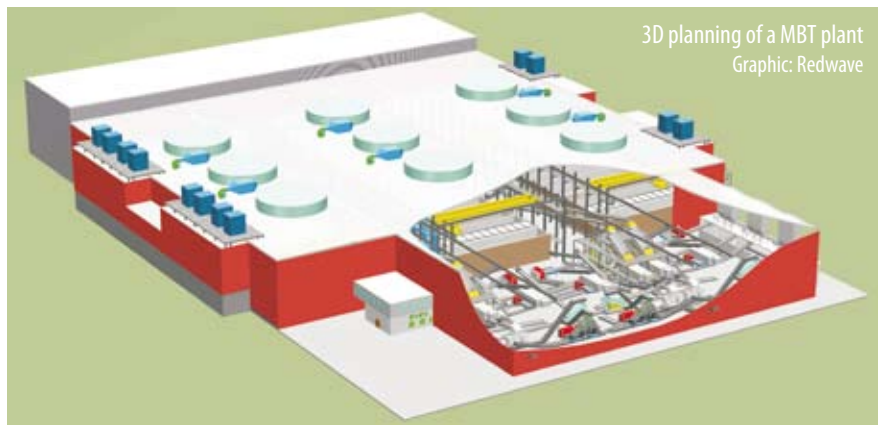
Chinese Waste to Be Treated with European Technology

A pre-treatment plant for household waste was ordered for the south-east of China from the Austrian-German technology firm Redwave.

By using mechanical biological treatment (MBT), it will dry and sort the waste for a local waste-to-energy (WTE) plant. The capacity of the facility will amount to 650,000 tons annually respectively 1,800 tons per day. The purchaser of the plant is a private Chinese waste and energy group. The facility will be erected in the province of Shandong with the start of operation scheduled for early 2018.

The facility is the second one the company will deliver to China. According to Redwave, it received its first Chinese order for an MBT near Shanghai in late 2015. It will process 270,000 tons of household waste per year.

The two waste processing plants in China will contribute to the solution of a country-specific problem: In many Chinese provinces, household waste is very high in moisture and thus low in heating value. It does not burn independently in waste incinerators without supportive co-firing of coal. So the first step in the mechanical biological treatment is a process called biological drying. The



3D planning of a MBT plant
Graphic: Redwave

second step is the mechanical treatment: Recyclable fractions like ferrous and non-ferrous metals are recovered from the dry matter. Also, incombustible, inert contraries like glass, sand, stones and pottery are separated. All combustible waste components like plastics, wood, paper, cardboard and other organics are processed to a so-called refuse derived fuel (RDF) with a sufficient heating value. It will be used in a nearby combined heat and power plant which employs circulating fluidised bed technology (CFB). CFB furnaces are very efficient but require a more homogenous and fur-

ther preprocessed waste than traditional grate furnaces. Both MBT plants will be operated fully automated.

"Until now, the new project is the largest individual order for the firm," the Austrian-German company reported. "Furthermore, it will be the largest suchlike MBT project in China. Amongst other components, four sensor-controlled Redwave classifiers will be installed. They will increase the efficiency of the RDF recovery in the mechanical sorting."

➔ www.redwave.at

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Eddy Current Separators “Made in Spain”

Eddy current separators are widely used to recover non ferrous metals in different industries.

Felemamg, a Spanish manufacturer of magnetic solutions for over 45 years, has extensive experience in the provision of equipment for waste treatment facilities in Spain and abroad. The company realizes two concepts with regard to eddy current separators.

On one side, Felemamg has developed the transversal magnetic metal separator type “SFM-29-T” machine with patent number PCT W07000212ES. This equipment has been specially designed to recover fine grain sizes (ranging from few microns to 4 millimeters) such as aluminium and copper, among others, from a non-electrically conductive material. The material will pass through a vibrating groove where the separation will be carried out transversally due to a magnetic roller made of rare earth magnets turning at high speed. In this way,



two material flows are segregated in the groove. The former, the electrical conductive metals fall down the step on the groove and they are led to the

evacuation point already segregated from the main flow. The latter, non-electrically conductive metals follow their trajectory without being influenced by the magnetic field.

On the other side, the Spanish company has a wide experience in manufacturing eddy current separators with an eccentric magnetic rotor. This model represents a great step forward with respect to concentric models because the eccentric rotor greatly reduces wear on the conveyor and the non-magnetic housing. Eccentricity (110 millimeters) minimizes maintenance requirements and extends the life of the machines.

The powerful SFME-29 magnetic rotor (271 millimeters diameter) enables to achieve extremely high efficiency because it repels non-ferrous metals with great force, causing them to eject into the discharge hopper. The separator is fitted with a high housing shell as a standard feature to provide greater safety during operation. This prevents the possibility of pieces rolling or being projected from the unit. Similarly, these separators come with a front hood to give them a very compact design. Such features not only prevent the projection of objects but also help to reduce the risk of operators becoming trapped.



Photos: Felemamg

➔ www.felemamg.com

VacuDry Drilling Mud Treatment Plant Delivered to Baku

The VacuDry by econ industries is a proven and resource-conserving technology. But the delivery of the two VacuDry 2x12,000 plants for drilling mud to Baku, Azerbaijan was a special event.

Equipment was stowed right up to the top in no less than 48 standard containers, each 40 feet long. Further system components were packed in wooden crates and found place on 13 heavy-duty transports. Together with 12 standard trucks the plant reached its final destination in the desert near the Caspian Sea from January to March 2016. As the main components were already assembled in Germany and only had to be positioned on site, the

mechanical construction, the electrical wiring and parts of the commissioning were in time. As the local trend news agency reported, the plant was ready to be taken over by the Azerbaijani state oil company Socar in an opening ceremony on 23rd of September 2016, in attendance of Gordon Birrell, BP Regional President for Azerbaijan, Georgia and Turkey. The two VacuDry plants were ordered to process drilling mud for the purpose of reuse. Designed by

VacuDry manufacturer Econ Industries for the recycling of 26 different types of waste and a production capacity of 100,000 tons per year, the plants allow to recover more than 16,000 tons of high-quality synthetic re-usable drilling oil per year. The implementation of the project – Socar President Rovnag Abdullayev is quoted – costs over 60 million manats (33 million Euro), but “will allow drilling companies to save tens of millions of dollars”.

High-Performance Machinery

On the international scene, and in solid urban and industrial waste treatment in particular, Italian-based company Forrec stands out for its ability to provide its partners with a truly effective solution to their needs: its experience in the sector and the technical expertise of its research and development department guarantee a tailor-made answer to every requirement.

Solid urban waste needs appropriate treatment prior to sorting or preparation for incineration. Forrec has designed a line that cuts the number of material preparation steps, providing quality output with a primary shredder (FR multi-crusher) and a screening machine, a combination that avoids the need for secondary grinding, with its attendant high running costs and non-stop maintenance due to the heavy wear caused by the nature of the product.

This innovative system, conceived, designed, built and already tested by Forrec, has what it takes to eliminate the problems encountered with other types of treatment. Forrec's surveys and research have shown that the market needs rugged yet simple

solutions, to reduce the costs generated by the specific characteristics of solid urban waste, which creates extremely high levels of wear on all components made from lightweight materials, writing them off in double-quick time.

As well as its high-performance FR multi-crusher, Forrec has built a screening machine with all components in contact with the waste in hard-wearing hardened, tempered steel to minimize maintenance costs while still guaranteeing perfect screening, high output and none of the typical problems of disc screening machines, such as the winding of material around the shafts. This ideal design from Forrec has attracted the interest of the South-East Asian mar-

ket, where large groups have been quick to see its real benefits, its many applications and its absolute reliability with low maintenance costs.

The appreciation and trust these Groups have shown in Forrec's technology lays the foundations for business which will lead to repeat applications at a large number of sites, to meet the market's huge demand.

The positive feedback already received confirms that the technology used can make the difference compared to the market's standard offering. Forrec's professionalism is a constant, its innovation goes on and on ...

➔ www.forrec.eu

New Landfill Compactor

The new Cat 816K landfill compactor builds on the established performance, durability, and reliability that the model 816 has demonstrated since 1972.

"The new K Series model, designed with heavy-duty main structures that support multiple life cycles, features a fuel-efficient Cat C7.1 Acert engine, single-lever steering, pressurized cab, and wheel/tip options that provide extended service life," the provider Caterpillar stresses. Available Cat Compact Technologies, such as Compaction Control, would further enhance compaction performance and consistency by providing accurate compaction values and 3D mapping.

According to the information, the foundation of the 816K's purpose-built design is its massive, robotically welded main structures, "featuring a full box-section rear frame that resists torsional shock and twisting forces, heavy-duty steering cylinder mounts to efficiently transmit steering loads into the frame, and an axle-mounting design that is optimized for increased structural integrity."



Photo: Caterpillar

The 816K's engine meets U.S. EPA Tier 4 Final/EU Stage IV emissions standards; a Tier 3/Stage IIIA equivalent configuration is available in certain areas

As reported, three new wheel and tip configurations allow matching the landfill compactor to the application. "The Paddle Tip reduces weight and provides high performance with reduced fuel burn. The Plus Tip provides

increased side-slope stability, and the Combination Tip provides an effective compromise of performance, fuel economy, and side-slope stability."

In addition, specialized guarding protects components from damage, debris accumulation, chemicals, and premature wear, including axle guarding that prevents material from wrapping and binding around the axles. The transmission oil tube is also guarded, and the fuel tank is positioned away from debris in the front frame. A screened air inlet for the radiator is placed high at the rear of the machine to prevent debris from blocking airflow, and the grille's design allows trash to fall away. Striker bars are designed to keep wheels free of debris, and optional cleaner fingers are available for use in cohesive soils and in material that packs between tips.

➔ www.cat.com

Mexico's First Commercial Waste to Energy Facility Started Up

The facility which is running in Hermosillo, Sonora, began to take shape two years ago, when the company Promotora Ambiental SAB de CV (PASA) set out to enter the waste to energy (WtE) market.

With more than 6,500 employees, a fleet of over 2,000 vehicles and 43 waste management facilities in Mexico, the firm handles 25,000 tons of waste every day. But acknowledging the growing pressures being placed on the country's resource infrastructure, PASA sought to produce a renewable fuel from its residual commercial and industrial (C&I) waste.

Following a global search for the best-fit shredding technology, PASA purchased the XR cutter waste shredder from international brand Untha. Following detailed discussions and trials, the XR was shipped to Mexico by sea-freight, completed by a discharge conveyor and overband magnet for metal extraction. During commissioning, the technology achieved the required output of 12 tons of processed feedstock per hour.

The team plans to further refine the RDF (refuse derived fuel) manufactur-



Photo: Untha / Scriba PR

Mexico's first waste-to-energy plant is up and running in Hermosillo, Sonora

ing process, to heighten the plant's capacity to 200 tons per day, by June 2017.

According to available information, the activities of Promotora Ambiental SAB de CV are structured in four areas: waste management services (private and residential collection, operation of landfills), water and biotechnol-

ogy (sewage, wastewater treatment and distribution of potable water), oil industry services (development and implementation of logistics for the management and treatment of waste resulting from well drilling activities), and Ecomar (mainly dedicated to the dismantling of obsolete ships).

➔ www.untha.com

Colombian Egg Producer Invests in German Energy Plant Technology

The German company Weltec Biopower will build an anaerobic digestion plant for Colombia's largest egg producer. The 800-kW biogas plant is to be brought on line in early 2017.



Photo: Weltec Biopower

In terms of the feedstock input, the operator Incubadora Santander, which produces about 3.5 million eggs a day, plans to make use of the co-digestion of dry chicken manure from the laying hens and process water from the production. According to Weltec Biopower, the feedstock will be pre-treated in a sedimentation tank. There, the manure will be separated from sand and lime and will be pumped into the 4,903-cubic meters digester by way of an upstream storage unit with a capacity of 1,076 cubic meters. "Through the co-digestion, the digestate will reach a high fertilizer value, enabling it to be

returned into the plant's agricultural substance cycle for efficient use as liquid manure on its own fields," the company said.

The Colombian government is supporting the generation of renewable energies. Goal is to increase the share of renewable energies in the power network to 6.5 percent by 2020. Especially Colombia's agricultural industry is producing large quantities of side products and waste that can be used for energy generation purposes. The country's energy potential for biomass is estimated at 16 GWh a year. So far, these have been used almost exclusively for the production of biodiesel and ethanol, but this will doubtlessly change in the near future.

Plant modules such as the ready-for-operation CHP plant, the preinstalled pump and control technology and the stainless-steel panels for the tanks will be transported to Colombia

➔ www.weltec-biopower.de

Electronics & Cars Recycling (World Recycling Forum)

November 15 – 18, 2016, Macau (China)

The Conference, exhibition and plant tours are organized by World Recycling Forum. During the conference, over 200 leading recycling experts from around the world – including manufacturers, collectors, processors, steelmakers, legislators and policy makers – will meet to discuss:

- How to operate successfully in the recycling business
- Protecting people and the environment
- Supply chain transparency
- Manufacturer take-back schemes and recycling efforts
- Government initiatives, such as the Circular Economy policy
- Processing technology advances and trends
- Reuse and refurbishment
- Mercury-containing scrap recycling (batteries, lamps, LCDs)
- Best ELV depollution and dismantling practices
- ELV shredding and downstream materials separation
- Electronics Refurbishment: Why and how to do it (panel)

➔ www.icm.ch

Plast Eurasia İstanbul 2016

December 7 – 10, 2016, Istanbul (Turkey)

Photo: Tüyap

The trading platform of Turkish plastics industry is organized by Tüyap Fair and Congress Center in cooperation with PAGEV - Turkish Plastics Industry Foundation. The four-day event will take place at the Tüyap Fair Convention and Congress Center in Istanbul and is considered the most significant and extensive meeting of the plastics industry in Turkey and Eurasia.

Within the scope of the fair, the latest technologies and innovations about plastics machinery, chemicals, raw materials, machinery auxiliary industry, heat and control equipment, mould, hydraulic and pneumatic as well as recycling will be showcased



for visitors. The exhibitors introduce their companies cost-effectively in the best efficient way in the global supply and supply chain, the organizers are convinced.

In 2015, Plast Eurasia İstanbul brought together the industry's leading professionals and 1,134 companies and company representatives from 53 countries with national pavilions from China, Iran, Korea, Taiwan and the United Kingdom across a 100,000 square meters exhibition area indoor. A total of 47,306 industry professionals visited the fair.

➔ www.plasteurasia.com/en/

IFAT Eurasia 2017

February 16 – 18, 2017, Istanbul (Turkey)

In 2015 IFAT Eurasia celebrated its successful premiere in Ankara. For its next edition, this Turkish version of IFAT, the world's leading trade fair for environmental technologies, is now moving to Istanbul. Between February 16 and 18, 2017, the Istanbul Expo Center (IFM) will be the showplace for products and solutions specifically tailored to the environmental market in Eurasia for the first time. According to the organizer Messe München, Istanbul is the ideal location for this event. "This city on the Bosphorus is Europe's most populous city and it ranks among the world's mega cities. There is a high

demand for technologies for the segments of water, wastewater, waste disposal and recycling." Through its geographical location as a link between Asia and Europe, Istanbul would also

be a central marketplace, offering an excellent basis for expanding international business relations.

➔ www.ifat-eurasia.com



Photo: Messe München GmbH

IdentiPlast 2017

February 22 – 23, 2017, Vienna (Austria)

The 13th edition of IdentiPlast – PlasticsEurope's International Conference on Plastics Waste Recycling & Recovery – will be held in Vienna on Wednesday 22 and Thursday 23 February 2017. This conference focuses on the particular challenges presented by the Circular Economy to "new"

European member states and other countries in the process of modernizing their waste management infrastructure. Through the sharing of best practice the intent is to accelerate the drive to efficient waste management and a more circular economy. The venue is set for Vienna which is – ac-

cording to the organizers – ideally placed in bringing together EU officials and regional players in the fields of collection, sorting, recycling and recovery of plastics from Europe and the rest of the world.

➔ www.identiplast.eu

Plastics Recycling Show Europe Moves to Amsterdam for 2017

March 29 – 30, 2017, RAI Amsterdam (The Netherlands)

The organizers informed that the Plastics Recycling Show Europe exhibition and conference will take place at the new venue of the RAI Amsterdam in The Netherlands and be held on 29-30 March 2017. "The inaugural Plastics Recycling Show Europe had to be postponed following terrorist incidents in Paris in November 2015 and then Brussels in March 2016. The very strong support received from the event's exhibitors, partners and prospective visitors has been a key driver in ensuring the event goes ahead

in March 2017," a press release said. "With security remaining an overriding consideration, the decision was made to move the event to RAI Amsterdam." The Plastics Recycling Show is a Pan-European free-to-attend exhibition and a conference designed specifically for plastics recycling professionals. It brings together key players from the plastics and recycling sectors to showcase innovative technology, share best practice, network and do business. A broad cross section of the industry will be repre-

sented at the event including plastics recycling machinery and equipment suppliers, plastic material suppliers and compounders, pre-processors, plastics recyclers, waste management specialists and industry associations. The conference will examine a wide range of industry themes including the economics of plastics recycling, the regulatory background, materials, processing, technology and innovation.

➔ www.prseventeurope.com

Index:

Aéro Montréal 6
AHK 16
Andritz MeWa 9
ATG 7
Babcock & Wilcox 6
BGR 4
BHS Europe 30
Biffa 30
BIR 15
Caterpillar 33
CEVKO 13
CSIR 5
DERA 4
Digitaleurope 10
EBRD 14
École Polytechnique 6
econ industries 32
EFR 6

Ellen MacArthur Foundation 10
EPA 23
ETW Energietechnik 14
Felemamg 32
Forrec 33
FRDW 26
Frost & Sullivan 5
GCC 5
General Motors 8
Global Market Insights 23
GreenAd Ghana 23
Greenpeace Russia 24
GTAI 14, 17, 25
H&M 11
ICM 35
ITC 14
ITO 3
Itronics 6
KfW-Bank 14

Kia 8
Mahindra Intertrade 4
Market Research Store 9
Messe München 35
MSTC 4
NGO 23
OAO UK 25
OECD 3
PAGEV 16
PASA 34
PlasticsEurope 36
prs-Europe 36
Redwave 31
SEPA 22
Shan Poornam Green Tech 9
Soex Group 11
Swedish Trade & Invest Council 28
Tehnix 20
Timberland 11

TÜIK 17
Tüyap 35
UERMP 27
Untha 34
VDP 16
Veolia 10
Visiongain 6
VKU 19
WACEE 23
WasteTech 31
Weltec Biopower 34
Worcester Polytechnic 7
Zara 11

The next Closing Dates:

No. 1/2017 – 14. March 2017

No. 2/2017 – 13. June 2017

No. 3/2017 – 12. September 2017



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Fax: + 49 (0) 81 41 / 53 00 21

E-Mail: notheis@msvgmbh.eu



SHREDDERS & SYSTEMS FOR WASTE RECYCLING



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**IERC
2017**



16th International Electronics Recycling Congress IERC 2017 January 17 – 20, 2017, Salzburg, Austria

IERC 2017 is the recycling industry's most important event, bringing together over 500 international producers, recyclers, equipment manufacturers, recycling associations, standards bodies, refurbishers, NGOs, regulators and many more.

Topics of the congress:

- Challenges of the Circular Economy
- Reuse & refurbishment
- Best available recycling technologies
- Supply chain transparency
- Which standards, compliance regulations and controls support or fail the industry?
- Recycling of hazardous components such as batteries, lamps, LCDs, mercury, etc.
- Safety standards for transportation

A spacious **exhibition** with over **60 booths** offers delegates the chance to network and forge great relationships. **Cocktail receptions** and a **networking dinner** create an excellent atmosphere to get in touch with international decision makers. The conference is also offering **plant tours** to leading recycling companies and various **workshops**.



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To exhibit: Anna REINEKE - Reed Exhibitions GMBH
+ 49 211-55628-536 / anna.reineke@reedexpo.de

To visit: Eva PASSMANN - Promosalons Deutschland
+49 0221 13 05 09 05 / e.passmann@imf-promosalons.de