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# GLOBAL RECYCLING

*The Magazine for  
Business Opportunities  
& International Markets*



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Are Looking for Solutions***

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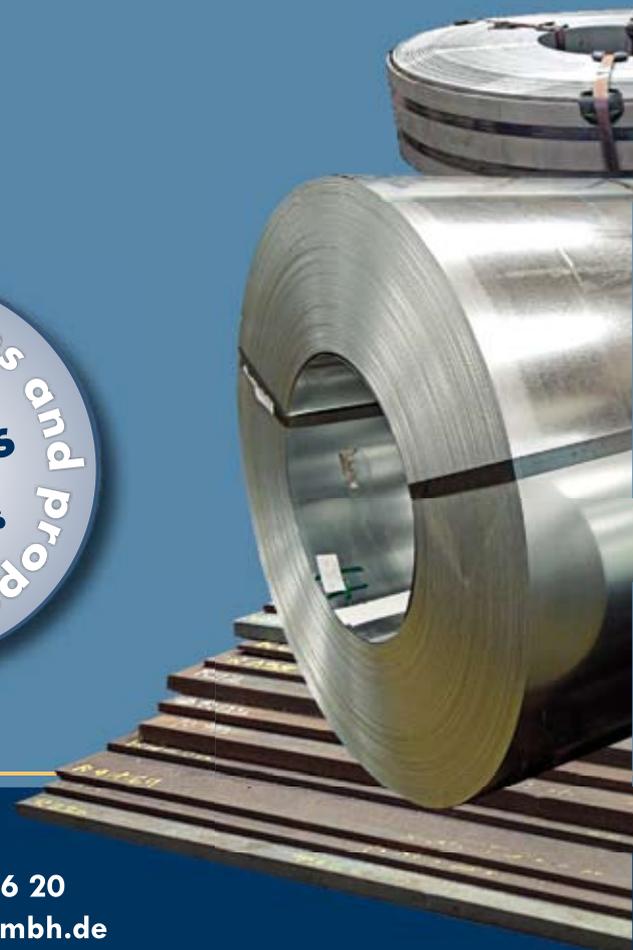


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## Recycling Efforts to Support the Fight Against the Climate Change

Enterprises are in great demand when it comes to reducing CO<sub>2</sub> emissions in order to stop global warming. According to a current survey of Climate-KIC (the greatest European initiative for innovation for climate-friendly technologies) on handling of the climate change by the European economy, companies are lacking the necessary know-how as well as determination and innovation willingness.



One result of the survey, which was published during the UN Climate Conference in Paris, was that 63 percent of the persons in charge recognized the risk potential of climate change for the enterprises. In view of the increasing demand for environmentally-friendly products and services, 63 percent stated that they could increase the turnover of their enterprises by becoming more environmentally-friendly. 59 percent reported that they already have a strategy for dealing with climate change as well as the identification of the involved chances and risks.

„Despite good intentions, less than a third (29 percent) of those polled enterprises see much leeway, innovative technologies and methods to employ for combating climate change“, Climate-KIC reported. „In fact only 14 percent of the enterprises see scope for action to extend their business model so that less resources are used and less greenhouse gases caused“.

Moreover, approximately every third enterprise (35 percent) believes, that their market was unaffected by factors such as climate change and consequently saw little necessity to change anything. According to the reports, the lack of legal certainty further contributed towards this attitude. A mere 30 percent of the enterprises stated that the current legislation for the climate change encourages them to develop innovations.

If the enterprises could play a more active role and would follow a more holistic approach, their willingness to seek avenues to change would certainly be higher. Recycling could thereby assist in dealing with resources through more sustainability. In turn, recycling could drastically curb the emission of carbon dioxide, if the producers deployed secondary raw materials more frequently. Ranjit Baxi, President of the Bureau of International Recycling (BIR), explains how this can be achieved on page 10.

Recycling is on the rise on the African continent as well. The state of Lagos in the Federal Republic of Nigeria is a good example when it comes to waste management and recycling initiatives (page 3 and 14). Namibia, where recycling activities will certainly begin to emerge, also shows positive intentions by offering long-dated business prospects (page 19). Furthermore, the Arabic countries are searching for solutions for waste management, particularly concentrating on the possibility to draw energy from waste (page 16).

We hope that you have found this article to be useful and we respectfully invite you to support our endeavors to develop this magazine.

Yours

Brigitte Weber (weber@msvgmbh.eu)



Photo: Arlo Magicman / fotolia.com



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## Lagos State Government Seeks Collaboration on Its E-Waste Initiative

The new General Manager of Lagos Waste Management Authority (Lawma), Abdul Wahab Ogunbiyi, has called for stakeholders' support for the Lagos indigenous initiative on Sustainable E-Waste Management process in the State.

According to the governmental agency, he stated this at the International Workshop on Enhancing Capacities for Environmentally sound Management of Waste Electrical and Electronic Equipment through the Regional Delivery in Africa, which took place at the end of October last year in Lagos, Nigeria. At this forum he presented a paper titled "Development of Machines for E-Waste Treatment in Lagos". Abdul Wahab Ogunbiyi informed the participants that in the state, "design works for four major machines have been completed with simple technology for ease of fabrication and maintenance sustainability," including double-shaft rotor pulverizing machine powered with two electric motors, a four-shaft rotor straddling machine, a three-blade single rotor crushing machine and a lifting conveyor.

### Funding local technology is needed

The General Manager of Lawma emphasized the need for world bodies, local and international corporate organizations and influential individuals to support the development of local technology for e-waste treatment, which he described as the pragmatic solution of preventing electronic waste from transforming to environmental pollutants, which are harmful to ecosystem and hazardous to humans. Speaking of roles of collaboration in the initiative, Abdul Wahab Ogunbiyi informed that Lawma had,



Photo: mekcar / fotolia.com

since 2011, keyed into research works initiated by the Environment Division of the Nigeria Society of Engineers. With the benefit of using e-waste management manual developed by the United Nations Environment Programme (UNEP) as a guide, the state authority had been able to design machines from resources sourced locally.

On this occasion the Lawma General Manager also stressed the need for the stakeholders and international organizations such as UNEP (United Nations Environment Programme), PACE (Parliamentary Assembly of the Council of Europe), ECOWAS (Economic Community of West African States) and African Union Commissions to play major roles in funding local technology to address the challenges of e-waste, while advising manufactures to accept – as part of their corporate responsibility – the ideal of a blue print to effectively manage e-waste that would be generated at the end-of-life of their products.

### Investment opportunities

Nigeria is divided in 36 states and a Federal Capital Territory (Abuja region). The commitment of the Lagos State Government towards sustainable waste management has made Lagos State a model for other Nigerian states. According to Lawma, the approximately 17 million inhabitants of Lagos State generate about 9,000 metric tons of waste daily. "The formal and informal sectors are a prominent factor in the recycling / resource recovery programme / activities in Lagos State over the years", the Lawma "Investors Guide on Recycling and Resource Recovery" says.

It is a compendium of essential requirements and provides interested investors that are willing to partner with the authority with a directory of the resources that are available to them and duties that are expected of them.

➔ <http://lawma.gov.ng>

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## Hong Kong Will Soon Get Its First WEEE Treatment Facility

The construction of the main building started in January 2016 and the facility is expected to be operational by mid-2017. Key partners of this joint venture include Alba, a recycling company in Germany, and IWS, a recyclable collector rooted in Hong Kong.

On 21 January 2016 Alba Integrated Waste Solutions Hong Kong Ltd. (Alba IWS), joined by officials from the Hong Kong Government and the Environmental Protection Department, has hosted a ceremony to celebrate the ground breaking of the project. The future Waste Electrical and Electronic Equipment Treatment and Recycling Facility (WEEETRF) will be located at the EcoPark in Tuen Mun, Hong Kong. According to the German-based company, the ceremony marked the start of the construction of the first WEEE treatment facility in Hong Kong and a milestone in its development of the Producers Responsibility Scheme (PRS) for WEEE.

### State-of-the-art technology

As reported, each year some 70,000 tons of WEEE are discarded from households, businesses and institutions in Hong Kong. The Government has signed contract with Alba IWS in May 2015 to design and build the WEEETRF, provide a collection service and operate the facility until 2027. "It is expected that the new plant will create up to 280 jobs for the people of Hong Kong," Alba says. The facility will use state-of-the-art technology provided by the German-based business group to process TVs, computers, washing machines and air-conditioners into valuable secondary raw materials while controlling the management of the hazardous materials that are contained in this equipment.



The facility is to transform up to 30,000 tons of regulated e-waste into raw materials each year. The capacity can be increased up to 57,000 tons by arranging additional shifts for the operation of the facility on a demand basis, Alba emphasizes. Beside the operation of the recycling plant, the company will as well be responsible for the collection of the WEEE materials. For this purpose a series of collection hubs over Hong Kong will be established where the materials will be consolidated for transportation to the facility at the Eco Park. Upon request by sellers of regulated electrical equipment as part of their take-back obligations, Alba IWS will provide free removal service to collect old equip-

ment from consumers' premises. Members of public can hand over the regulated e-waste at all of the collection hubs.

With the introduction of the PRS in 2016, the Hong Kong Government will develop further regulations to enhance control over the storage, treatment, reprocessing and recycling of the regulated electrical equipment. Consequently, the management, treatment or disposal of any specified WEEE will be subjected to regulatory control and a Waste Disposal License must be obtained under the Waste Disposal Ordinance.

➔ [www.weee.com.hk](http://www.weee.com.hk)

## Suez Speeds Up Its Development in the Industrial Sector in China

Through its subsidiary, Sino French Water (a 50/50 joint venture, founded in 1985 in partnership with New World Services, Hong Kong), French-based group Suez Environnement has entered an agreement with the Chinese company Changshu Urban Construction and the Changshu Advanced Materials Industrial Park (CAMIP) to set up a joint venture. It is planned to treat the effluents from

the Park. Under the terms of the agreement, Sino French Water will hold a 24.5 percent stake in the newly created joint venture, Changshu Sino French Industrial Water Treatment Company Limited.

Changshu Urban Construction will hold 25.5 percent and the CAMIP 50 percent. The contract should generate 354 million Euro of revenue over

the next 30 years, assumes the management of the French company. According to Suez Environnement, this agreement consolidates its position in the industrial sector in China, where it already delivers its expertise in the management of environmental services to ten industrial parks, including the Shanghai Chemical Industry Park (SCIP), the largest petrochemical complex in Asia.

## Croatian Firm Recognized for Its Technology

At a conference about “Sustainable Technologies for Mixed Municipal Waste Management”, held in Brussels (Belgium) from 26 to 27 January this year, the MBT-T Technology of the Croatian Company Tehnix was accepted as an economically and ecologically sustainable procedure for achieving the goals of the circular economy, the company reported.

On this occasion the Croatia-based firm Tehnix, headquartered in Kraljevec, presented its international projects in Serbia, Ukraine and Kazakhstan. As outlined by the company – the supplier of container parks, devices and equipment for municipal solid waste and other miscellaneous waste management as well as wastewater treatment – was the main technological partner of the conference and introduced itself to the relevant institutions and professionals in Brussels. Đuro Horvat, owner of Tehnix, announced very dynamic commercial activities of the company. It is expected that important agreements and contracts for future jobs will be concluded. Investment in infrastructural projects in countries of South-



Photo: Tehnix

At the international conference Đuro Horvat (right), owner of Tehnix, announced very dynamic commercial activities of the company

east Europe is one important topic of the circular economy. According to Tehnix, the conference was attended by more than hundred participants, among them representatives of the

European Parliament and a number of registered representatives of the utility sector from Croatia, Slovenia, Bosnia and Herzegovina, Austria, Germany, Spain and Belgium.

## Apollo Tyres Ltd Increases Its Focus on Retreading in India

According to Indian-based Apollo Tyres Ltd, there is a large demand for quality retread in India, which is not widely available in the country. Therefore, the company intends to spread its Indian network for branded retreading outlets and plans to have 20 Apollo Retread Zones (ARZ) by this financial year ending on March 31, 2016.

Apollo Tyres started with its ARZs in 2014; the first three outlets were opened in Jaipur, Chennai and Mumbai. In July 2015, the fourth ARZ was opened at Manipal in the Coastal Karnataka region. According to media reports, considering the huge potential for retreading in this state, the company is targeting to have its ARZs in Bengaluru, Belagavi, Hubballi and Shivamogga as well. Apollo's objective is to provide quality retreading service to truck-bus customers and fleet owners. As stressed by the company, these branded outlets are equipped with advanced retreading machines, high quality tread material and trained workers.

The increase in usage of radial tires in the truck-bus segment has enhanced the potential for retreading and thereby the need for more retreading outlets. “The Retreading Industry in India is gradually getting more and

more organized”, Apollo Tyres says. “The customers are opting for multiple retreads on their tires, and prefer the same to be done by the tire manufacturers, instead of unorganized players.”

Apollo Tyres Ltd is headquartered in Gurgaon, India. It has been in the business of manufacture and sale of

tires since its inception in 1972. Over the years, the company has grown exponentially, establishing its footprint across the globe. At the end of its financial year on March 31, 2015, Apollo Tyres had clocked a turnover of 2.08 billion US-Dollar, backed by a global workforce of approximately 16,000 employees.

### Setting up a new manufacturing facility

Apollo Tyres Ltd has manufacturing units in India and the Netherlands. It is also setting up a new manufacturing facility in Hungary, with a planned investment of 475 million Euro. The company markets its products under its two global brands – Apollo and Vredestein – in over 100 countries through a vast network of branded, exclusive and multi-product outlets.

➔ [www.apollotyres.com](http://www.apollotyres.com)



Photo: Apollo Tyres

## Buhler Sortex and NRT Joined Forces on Plastics Recycling Sorting

As the demand for plastic sorting solutions continues to soar, the London-based Buhler Sortex, a member of Swiss Bühler Group, and US firm National Recovery Technologies (NRT), headquartered in Nashville (Tennessee), have entered a strategic commercial agreement.

The objective is to offer plastics recyclers a complete solution for plastic bottle and flake sorting. According to Bühler Group, the companies are bringing together more than 100 years of combined expertise in optical sorting giving recyclers access to their technologies, engineering expertise, customer service and support networks.

The partnership between Buhler Sortex and NRT expands not only their PET and HDPE sorting segment across Europe and North America. The companies are convinced it also strengthens their position as the leading joint suppliers of combined plastic bottle



NRT and Buhler Sortex intend to offer plastics recyclers a solution for bottle and flake sorting

and flake sorting solutions to the plastics recycling industry, with technologies such as In-Flight Sorting, PET Boost, Label Reduction Kit and Smart-Eject. Apparently, the development proves them right: As reported, global

plastics production increased by ten million tons to around 280 million tons in 2011, continuing the growth pattern that the industry has enjoyed since 1950 – approximately nine percent per annum. Europe and the NAFTA (North American Free Trade Agreement) region together comprise 41 percent of the world's total plastic materials production – “driving demand for integrated bottle and flake sorting solutions, as companies strive to meet government recycling targets and corporate social responsibility pledges,” Bühler Group stated.

➔ [www.buhlergroup.com](http://www.buhlergroup.com)  
 ➔ [www.nrtsorters.com](http://www.nrtsorters.com)

Photo: Intersearch

## US-Company Acquires Multiple Biogas Facilities in Italy

In December last year, the North Carolina based Blue Sphere Corp., a clean energy company that develops, manages and owns waste-to-energy projects, has completed the acquisition of four operating biogas facilities in Italy.

The company has acquired 100 percent of the stock of Agricerere S.r.l., Agrielektra S.r.l., Agrisorse, S.r.l. and Gefa S.r.l. “Individually, each fully operational facility generates one megawatt of electricity per hour which is sold to Gestore dei Servizi Energetici GSE S.p.A., a state owned company that promotes and supports renewable energy sources in Italy, under a power purchase agreement (PPA) that runs through December 31, 2027,” Blue Sphere reported.

According to the information, the four biogas facilities combined are expected to generate approximately

8.4 million Euro (or the equivalent of approximately 9.24 million U.S. Dollar) in annual revenue. The four biogas facilities combined will generate a minimum of 3.76 million Euro (4.136 million U.S. Dollar) in annual EBITDA (earnings before interest, taxes, depreciation, and amortization). “The annual EBITDA of each biogas facility is guaranteed by Austep S.p.A, our operating partner and a global leader in waste to energy technology and management,” Blue Sphere said. “The Austep S.p.A financial guarantee is further backed by an insurance policy underwritten and issued by a leading insurance provider.” The enterprise value of these four

facilities as stated by Innovatec S.p.A is approximately 24 million Euro. As reported, the company paid 5.2 million Euro plus closing costs to acquire all four biogas facilities including the assumption of certain debt associated with the acquisition of each facility. Fifty percent of the cash component of the purchase price plus closing costs was paid at closing, with the balance due three years from the closing date. Blue Sphere was provided with 2.9 million Euro of capital from Helios Energy Investments to complete these acquisitions.

The company likes to emphasize that these acquisitions represent only four transactions of a pipeline of twenty-five biogas facilities that Blue Sphere is evaluating for acquisition in Italy alone. With these transactions, Blue Sphere has developed a network of brokers, consultants, legal and accounting experts that will allow for further expansion into the European marketplace.

➔ [www.bluespherecorporate.com](http://www.bluespherecorporate.com)



Photo: Blue Sphere Corp.

## European Union Opens up 24 Billion Euro of Existing Finance to Circular Economy Businesses

The European Commission and the European Investment Bank (EIB) have announced changes to EU financial tools to help circular economy projects and businesses secure funding and support the realization of EU climate goals. The changes build on the EU's Circular Economy Strategy launched in December last year and result from EIB recommendations published at the Financing the Circular Economy conference hosted under Luxembourg's Presidency of the EU.

An amendment to the InnovFin Delegation Agreement signed at the conference will enable higher-risk, yet in-



novative sustainable business models and plans to access credit through InnovFin – an EU finance support program under Horizon 2020, which was previously only available to innovative

industrial and technology enterprises. InnovFin Advisory, a financial advice service in the EIB, will also support mid-sized businesses in making their circular economy projects investment ready in order to benefit from the Mid Cap InnovFin financial products.

More information at Report „Assessment of access-to-finance conditions for projects supporting Circular Economy“ by InnovFin Advisory and EIB Advisory Services – Executive Summary (➔ [www.eib.org/attachments/press/innovfin-advisory-report-on-circular-economy-executive-summary-public.pdf](http://www.eib.org/attachments/press/innovfin-advisory-report-on-circular-economy-executive-summary-public.pdf)).

Source: Royal Haskoning DHV / European Commission

## Building Work on Metal Recovery Facility in Singapore

The German-based Remex Mineralstoff GmbH recently completed the construction of a state-of-the-art recycling facility in Singapore to process incinerator bottom ash (IBA) and recover the metals contained in the material. The plant was opened by Masagos Zulkifli, Minister for the Environment, and Norbert Rethmann, honorary chairman of the supervisory board of the German Rethmann Group. The new metal recovery plant was commissioned in July last year after having been built within a period of eight months. Remex founded

Remex Singapore Pte. Ltd. to build and manage the facility, its first ever branch operating outside Europe. This local company is running the plant on behalf of the Singapore National Environment Agency, which had put this project out to tender as part of its long-term plan to improve resource efficiency in the country.

The plant is able to recover both ferrous and non-ferrous metals and is located on grounds covering 1.4 hectares in the Tuas district in Singapore. As reported, Remex will be able



Photo: O. Kirth

to process about 600,000 tons of IBA generated by the four household incineration plants every year.

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## Effective Fire Protection with Flexible Elements

Fire prevention and fire control are a hot topic in the Waste Industry these days. A fire can cause a lot of damage to properties and harm to people and the environment.

The Legioblock construction system is an excellent solution for fire-proof site partitioning, the Dutch provider A. Jansen B.V. underlines. The firewalls “segregate waste stacks of bulk materials such as wood, paper, tires and recycling materials and prevent fire from spreading to other compartments, neighboring buildings or storage facilities.”

As reported, the system offers a quick and flexible solution for the construc-

tion of concrete firewalls. “Legioblock concrete stackable blocks only degrade marginally when exposed to fire,” the company emphasizes. “The temperature rise on the non-exposed side of the concrete wall is so low, that fire propagation through heat transfer cannot take place.” According to A. Jansen B.V., the engineering agency SPA has investigated the fire-resistant properties of concrete retaining walls built with these flexible concrete elements as partitions for the storage of

combustible materials, with the following conclusions as a result:

- Legioblocks are incombustible and fall within the highest A1 class in accordance with the DIN EN 13501-1 standard
- Over four hours fire resistance
- Flashover excluded

Even in persistent fires that lasted for several days, these concrete firewalls retained their integrity and prevented the fire from spreading to neighboring buildings or storage facilities.



Photo: A. Jansen B.V.

### Quick and flexible construction system

“Legioblock concrete blocks are easily stacked and placed, without the need for any fixing materials such as cement,” the provider assures. “This allows complete freedom to move and replace the blocks after construction. It is also a very quick solution: The blocks are delivered from stock and the firewall can be built straight off the lorry.”

➔ [www.legioblock.com](http://www.legioblock.com)

## Vietnam: Free Take-Back Program for Used or Defective Electronics

The recycling of e-waste in Vietnam is on the rise: After having been introduced to Ho Chi Minh City in April last year, “Vietnam Recycles”, the free take-back program for end-of-life electronic equipment, was launched also in Hanoi.

The program aims to call for public participation in building a greener Vietnam through conducting safe and sound e-waste recycling practices. The collected equipment will be sorted according to product categories and dismantled in a designated facility to assure maximum material recovery of the different commodities.

According to Vietnam’s Institute for Environmental Science and Technology (INEST), the volume of e-waste in Vietnam is increasing rapidly due to the sharp growth in product demand, but the level of public awareness regarding waste of electrical and electronic equipment (WEEE) is very limited. “Vietnam Recycles” is run by the Vietnam Recycling Platform (VRP),

a consortium of leading manufacturers founded by Apple and HP while the German-based Reverse Logistics Group (RLG) operates the system as a general contractor, carried out by the subsidiary RLG Asia Pacific Pte. Ltd. The objectives of VRP are to reduce electronic waste, increase recycling and manage the environmental,

health and safety impact of products at the end of their life cycles.

The program supports both producers and consumers and is fully compliant with the Prime Ministerial Decision about the collection and treatment of discarded products in Vietnam which came into effect in January last year.



Photo: © Sbores | Dreamstime.com

## New Worldwide Metal Recycling Scrap Network

Metalface, a new online all-in-one business network, will enable metal recyclers to find, connect, communicate and share prices with people in the industry in real-time. According to the organizers, it is free to use and backed by industry leading compa-

nies in the media, federations (e.g. VDM) and recyclers (e.g. Cronimet). "This platform will revolutionize the way people in the metal recycling industry will communicate," Metalface.com says. The network would allow users to search and contact metal

recyclers at over 15,000 companies worldwide. Furthermore, they would be able to communicate in real-time (with the chat app) with all contacts on PC, Android, iPhone, iPad, tablets and Blackberry devices.

➔ [www.metalface.com](http://www.metalface.com)

## Finnish Expertise for Italian Waste Water

In the European Demosofc Project, Convion Ltd and VTT Technical Research Centre of Finland Ltd will demonstrate fuel cell systems for high-efficiency cogeneration of heat and power from biogas produced in connection with waste water treatment in Italy. The fuel cell plant in the Collegno waste water treatment facility of the Italian Società Metropolitana Acque Torino S.p.A. (SMAT) in Turin

will be the first of its kind in Europe in terms of size and technology. As reported, the system being developed in this project will satisfy 30 percent of the electrical needs of the waste water treatment and 100 percent of the normal thermal needs of the treatment process.

The five-year project (2015-2020) has an overall budget of 5.9 million

Euro and is financed by the European Union with 4.2 million Euro in the framework of the Horizon 2020 program. The project is coordinated by the Italian Politecnico di Torino, and the multinational European project consortium consists of Convion and VTT from Finland, Polito and SMAT from Italy, and the Imperial College of Science, Technology and Medicine from the UK.

## Erema Finds Subsidiary in Russia

The Austrian-based Erema GmbH has founded a new company in Russia. Besides Erema China and Erema North America "OOO Erema" is the third subsidiary of the producer of plastic recycling systems. The official presentation of the newly founded subsidiary company took place at Interplastica Moscow from 28th to 31th January 2016.

The 268 million inhabitants of the CIS (Commonwealth of Independent

States) use around 9.1 million tons of plastic every year. Additionally, some seven million tons are processed to make plastic products and Austria supplies every year nearly one billion Euro of plants and machinery to Russia alone. Therefore, the Austrian company is strengthening its presence in the CIS member states.

As reported, this means that Erema is available as a central, Russian contractual partner with local presence.

Together with his team, Kalojan Iliev, Managing Director of the new subsidiary, will be responsible for the further development and marketing of Erema in the CIS region and support activities of the local representatives in the individual countries. Furthermore, the established offices of Textima in Belarus, the Baltic states, Ukraine, Kazakhstan, Uzbekistan, Azerbaijan and the Russian offices in St. Petersburg, Moscow and Ufa will likewise be available for local market support.

## Alba Group Plans to Boost Business and Service Activities

Berlin headquartered German Alba Group has delineated its strategy within the investor recruitment drive to step up the expansion of its China business and domestic market growth. "We want to strengthen our key growth areas of China and the '4 R's – reduce, reuse, recycle and rethink' – with additional equity investors," Dr. Axel Schweitzer, CEO of Alba Group plc & Co. KG, was quoted on 31 January. As reported, negotiations with Asian partners have shown that

it makes sense to focus their investment on China. Under the "China Growth" strategy launched by Alba Group around six months previously as part of its investor recruitment drive, a partner is to be selected for the China business. According to Schweitzer, the company has made good progress "and we are already at an advanced stage in talks. As announced, the contract signing will be in the first half of this year". The focus here is on selected technology areas

such as automotive and electronic waste recycling, where the company's expertise will be put to work in additional facilities in China. To further strengthen home market activities, the German Group is going to bring on board a strong investment partner in its service business. "Capabilities in this sector include take-back systems for sales and transport packaging, waste avoidance, product recycling solutions and facility management," Alba said.





# “The Benefits of Recycling Are still Under-Acknowledged”

Bureau of International Recycling (BIR) World President Ranjit Baxi is tireless in explaining the environmental benefits and huge potential of recycling. He underlined the importance of recycling in the fight against climate change also in the margins of the COP21 meetings in Paris.

In his speech during an event organized by the French recycling association Federec Mr Baxi explained that the early results of BIR's updated report on “Environmental Benefits of Recycling” allow the conclusion that the CO<sub>2</sub> savings achieved through recycling are on the rise: For aluminium, savings amount to 92 percent compared to primary production, for copper 65 percent and for ferrous 58 percent. The first BIR report on “Environmental Benefits of Recycling” (published in 2008) showed a substantial 500 million tons of CO<sub>2</sub> emission savings through recycling, which is the equivalent of the total annual carbon dioxide emissions of the global aviation industry. He also stressed that the figures in the study were rather conservative and that not all commodities had been taken into account. “My personal evaluation is that the recycling industry saves up to 700 million tons of CO<sub>2</sub> per year, which adds up to several billion tons over past decades,” he said according to BIR, the global recycling industry association representing

around 800 companies and 34 affiliated national recycling federations from 70 different countries.

“Global Recycling” has asked Ranjit Baxi, how recycling – as part of the climate change discussions – can be further promoted.

*Recycling prevents CO<sub>2</sub>-emissions, saves energy, protects natural resources and contributes to a sustainable economy, that has already been proven by numerous studies. This raises the question of why the importance of recycling and secondary raw materials for the climate has not been detected earlier. From your point of view, what could be the reasons for this?*

The energy savings from using recycled raw materials instead of primary raw materials has been well recognized for decades, but more so from the 1990s when Life Cycle Analysis became a popular tool collating data for many materials. Translating energy savings into CO<sub>2</sub> savings was

a simple step. The benefits of recycling in terms of CO<sub>2</sub> savings and so climate change mitigation is still under-acknowledged, so continuous publicity is needed in all the concerned fora towards all stakeholders. This was one of the reasons why BIR commissioned its first official study on the benefits of environmental recycling in 2008, mainly to get official data to substantiate our claim that recycling was saving enormous amounts of CO<sub>2</sub> emissions. We are currently in the process of publishing an update of this study in order to maintain the momentum of the importance of recycling for environmental protection. By publicizing this new study we further endeavor to spread the message that recycling is vital for the future of our planet.

***The recycling economy is considered to be the ideal solution regarding the sustainable handling of the earth's reserves of raw material. According to the prevailing opinion, this cannot be put into execution without recycling and neither without properly functioning markets. For which raw materials is the international sale secured?***

Before recycling, for sustainable materials management, increasing the lifetime of products in service by their repair, refurbishment and upgrading to extend their reuse is a recognized policy goal. However, there is a disturbing trend of more and more countries seeking to restrict imports of second-hand goods, ranging from second-hand cars to second hand clothing. Against best advice, some countries are openly denying imports of second-hand products in order to supposedly enable their national manufacture of new products. Apart from the reuse of products, well functioning markets are needed for recycled raw materials too. In order to get the maximum benefit from recycling in terms of climate change mitigation, the use of recycled raw materials needs to be optimized. Whilst countries may be most efficient in collecting what will become recycled raw materials, this does not automatically mean that the industrial demand for those recycled raw materials is located in the same country. This is why trade in recycled raw materials is necessary, a premise that BIR has been claiming since its inception in 1948.

***How could markets for not yet or rarely used secondary raw materials be created within an international market-driven circular economy?***

The economics have to be right for consuming industries when choosing between recycled raw materials and primary raw materials, in order to choose recycled raw materials. To give recycled raw materials at least a fair market BIR advocates that all disincentives to using recycled raw materials be removed such as eliminating import tariffs and taxes, and that all incentives to use primary raw materials such as subsidies and tax benefits be removed.

***Secondary raw materials cannot be traded without further ado. The product status is supposed to change that, especially since defined quality and facilitations are connected with it in the international trade. Which secondary raw materials can already be traded as a product?***

The status of a recycled raw material as a product is currently possible through national instruments such as protocols and laws; through bilateral agreements between countries that mutually recognize a particular recycled

raw material as a product; and in the case of the EU embedded in regulations for iron & steel, for aluminium and aluminium alloys, for copper and for glass.

***In your experience as international salesman of secondary raw materials, does it have any advantages that the materials stay within the waste regime, when the quality set by the trading partners is right?***

When there is minimal risk in the classification of any recycled raw materials as product and so protection of human health and the environment is maintained there is surely no justification to continue to apply the waste laws. Indeed national consuming industries are commonly seen to promote the unnecessary continuation of waste laws in order to suppress the prices of recycled raw materials and curtail their trade with other countries for their own commercial and economic benefit. Unfortunately, both suppressing prices of recycled raw materials and curtailing trade harms national collection efficiencies and economics; and in hindering the possibility of optimizing recycling ultimately protectionist trade policies reduce the possibilities of climate change mitigation.

***The BIR dedicatedly supports free global trade. To what extent are these efforts successful? In which regions are trade restrictions for recycling material still existent?***

More and more countries, contrary to the best economic advice, place taxes, quotas, and other hindrances to the export of recycled raw materials. Furthermore, as already described, more countries prohibit or seek to prohibit second-hand goods. Most of those countries reason (albeit mistakenly in the long term) that these trade barriers are to protect their national industries. BIR carries out its ef-

Photo: BIR



***"The recycling industry has always shown tremendous adaptability and resilience in difficult times," says BIR President Ranjit Baxi***

forts to remove trade barriers at all political levels, either internationally or with specific countries.

*What influence do the ocean freight rates have on the international trading with secondary raw materials?*

Sea freight (logistics) constitutes a major part of the pricing for recyclables. Therefore, any movement of cost has a direct impact on the marketability of recyclables. For scrap processors, dealers and brokers, the price of moving material from point A to point B can be either a profit-maker or a profit-breaker. Therefore, they must develop close relationships with shippers as well as an excellent knowledge of the shipping market. The cost of ocean freight in comparison to inland transport costs will influence the recyclers' choice of customer, near or far, simply on economic grounds. Recycling companies need to be an expert in the interplay between these various modes to ensure they adopt the most viable option for each cargo. Through our world organization's membership of the International Maritime Bureau (IMB), which is the crime-fighting unit of the International Chamber of Commerce, BIR members have access to a colossal IMB database that will allow them to verify the validity and good standing not only of shipping companies but also of prospective new customers. The database can also help recyclers to identify specific ports or regions where theft or other shipping-related problems appear particularly acute, and it can provide updates on any shipping line issues.

*According to the latest projections, the global economy 2016 is expected to grow moderately. How do you assess the market development for secondary raw materials this year?*

The very low commodity prices have depressed collections, some recyclers have gone out of business, whilst others consolidate. Consuming industries have suffered too and so there are fewer customers for recyclers. When we are at a low point we hope the only way is up. The recycling industry has always shown tremendous adaptability and resilience in difficult times and despite difficult market conditions we try to move on. Of course, our ultimate wish is that the use of our recycled raw materials picks up so that we can continue doing our important job for the benefit of the environment.

*As BIR World President you have set yourself the task to bring a "Global Recycling Day" into being, in order to promote the recycling message worldwide. In this regard, are there any concrete plans? When could the first "global recycling day" take place?*

As you know, this is a project that is particularly close to my heart. With reference to your first question I feel that the Global Recycling Day would contribute immensely to raising the profile of recycling and all the industries that are involved in recycling.

We at Bureau of International Recycling have recently created a dedicated task force that will bring this project to the next level. But as you can imagine, such an ambitious plan cannot be achieved overnight. We are currently outlining the scope and looking at possible partners and will make the initiative known to key international bodies. But be assured that we will keep you informed along the process.

*Mr Baxi, thank you very much for the interview!*

## New Project Aims to Reduce Textile Waste

The European Clothing Action Plan (ECAP), a new project led by UK-based Waste and Resources Action Programme (WRAP), a charity limited company, is about embedding a circular economy approach for the clothing sector. Furthermore, it aims to increase environmental and economic benefits by reducing the carbon, water and waste footprints of clothing in the European Union – and hereafter also in Asia.

To reduce clothing waste, the 3.6 million Euro EU Life funded pilot project, will work with brands, retailers, manufacturers, reuse and recycling organizations, charities and consumers to:

- design and specify products for longer life and closed loop production
- ensure that less clothing goes to incineration and landfill
- encourage consumers to buy less clothing and use it for longer
- improve innovation in resource-efficient design and service models to encourage business growth in the sector.

As reported, the three year project, which runs until March 2019 involves WRAP working in partnership with



The ECAP project aims to reduce textile waste

Made-By (a Dutch not-for-profit organization, acting to improve environmental and social conditions within the fashion industry), Rijkswaterstaat (part of the Dutch ministry of Infrastructure and the Environment), Dan-

ish Fashion Institute and British LWARB (London Waste & Recycling Board) to divert over 90 thousand tons per year of clothing waste from landfill and incineration across Europe. To achieve this, ECAP, which is based on the principles of WRAP's Sustainable Clothing Action Plan (SCAP) in the UK, will ask signatories to the agreement to measure success against a set of ambitious targets.

The initial countries that ECAP will be active in are Denmark, Finland, Germany, Italy, Netherlands, Norway, Poland, Romania, Spain, Sweden, UK, and there are further plans to expand into other countries in Europe and Asia.

Photo: Reinhard Weikert / abfallbild.de



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# Nigeria Has Many Business Prospects to Offer

The Federal Republic of Nigeria is considered to be an emerging market by the World Bank and has been identified as a regional power on the African continent.

The country in the western part of Africa consists of 36 States and a Federal Capital Territory, where the capital Abuja is located. According to the World Bank, the population of Nigeria was 2014 estimated at 177.5 million people with a Gross Domestic Product (GDP) at market prices of 568.5 billion US-Dollar. Nigeria is the world's 20th largest economy.

Due to the increasing population, urbanization and industrialization, the waste management situation in Nigeria is a challenge, a report of the Waste Management Society of Nigeria (Wamason) stated some years ago. According to the author Edith Tobore Iriuruaga, there is a strong demand for "good waste management service", public health and environmental protection. As reported, Lagos State is a model for other States in Nigeria, because its government is committed to a sustainable waste management. There are varied data on waste generation and composition due to poor information management, but a study carried out by TC Ogwueleke in 2009 showed that the rate of waste generation was between 0.66 and 0.44 kilogram per capita and day. According to the Nigerian Environmental Society

(NES), the annual waste generation in Nigeria amounts to 60 million tons with less than ten percent waste management capacity.

In 2012, biodegradable waste accounted for more than 50 percent of waste generated with other components estimated at different composition in different states. A study carried out by the Bayero University Kano in March 2012 estimated the composition of the waste material: polyethylene/cellophane (19 percent), paper (12.7 percent), metal (10 percent), glass (8.7 percent), plastics (11.3 percent), fines – ash, dust and sand – (12 percent) and miscellaneous (9 percent), reported Edith Tobore Iriuruaga. In 2009, the Basel Convention Coordinating Center of Africa revealed that 70 percent of all imports were used electronic electrical equipment of which about 30 percent could be described as e-waste.

Waste collection service is offered mainly by the public sector though some state governments operate some level of formal public-private partnership (PPP). However, it is not uncommon to see informal waste collectors us-

ing push carts for collection services from door to door in some parts of Nigerian cities, described Edith Tobore Iriruaga the situation. As reported, collection services are offered mostly in urban areas with not higher than 50 percent efficiency in most cities; exceptions are Lagos and Calabar (in Cross River State).

## Recycling in Nigeria

The informal recycling sector is very active in the Nigerian waste management system, Edith Tobore Iriruaga stated. Itinerant waste buyers or scavengers target valuable materials such as plastics, paper, glass, metal and used electrical equipment. Although their activities have great impact on the reduction of the net volume of waste disposed of, there is no formal integration of this stakeholder into the system except in Lagos State. Lagos Waste Management Authority (Lawma) introduced recycling banks in some organized areas where households are encouraged to deposit their recyclables like plastics, cans and bottles, while the organic components are collected from door to door.

According to the author, the formal sector is becoming interested in recycling in some Nigerian states due to pilot projects which encourage source separation of waste.

## Lagos State prefers recycling and resource recovery

Because of overfilled disposal sites, Lagos State are adopting resource recovery as a suitable alternative and ideal option for sustainable development “which encourages an environmentally friendly living in the society”, Lagos Waste Management Authority says. Lawma is the waste management organization and is responsible for the collection and disposal of municipal and industrial waste, as well as the provision of commercial waste services to the state and local governments. According to its own statement, it has created job opportunities with over 25,000 staff.

The following investments opportunities are available to interested investors.

- **LAWMA Recycling Bank:** The purpose of the recycling bank is to bring a sense of collective responsibility to the citizens of Lagos State, making it a productive and participatory venture between the government and the people. This will be situated in housing estates, event centers, shopping malls, bus stops and major roads within Lagos metropolis to serve as a storehouse for recyclable materials.
- **Compost:** Compost is produced at Odogunyan compost plant, Ikorodu. Investment opportunities are available for interested investors who want to partner with Lawma to achieve high nutrition compost.
- **Paper:** The bulk of paper collected from the landfills or recycling banks are sorted, graded at the paper baling section, Olushosun, Ojota and processed at Jebba Paper Mill. Lawma provides three million Naira (about 14,880 US-Dollar) worth of waste papers for conversion, while paper and news print are potential markets.
- **Briquettes:** Charcoal and biomass briquettes can be made and sold by entrepreneurial community groups, business people as well as potential for exporting in the long run.
- **Plastic:** Lawma currently converts tons of plastic and nylon water sachets. Abundant PET bottles are equally available.
- **Buy Back:** The Lawma buy-back program is a major component in recycling. This initiative helps to provide jobs and source of income for the youth and the community there by increasing the economic benefit of recycling.
- **Other investment opportunities:** waste to energy, tire recycling, e-waste recycling, briquetting, aluminium cans, metals, car crushing, etc.

The Lawma Investor’s Guide can be downloaded at  
 ➔ <http://lawma.gov.ng>.

## Metal Recycling Market – Forecast to 2020

According to the US-based online aggregator and distributor of market research and business information Fast Market Research, the global metal recycling market size will grow from 277.12 billion US-Dollar in 2015 to 406.16 billion US-Dollar by 2020, at a projected Compound Annual Growth Rate (CAGR) of 7.95 percent. The metal recycling market is driven by strict laws pertaining to waste management.

The use of recycled metal in the building and construction sector is projected to increase during the forecast period. According to the prediction, this segment will be the fastest-growing end-use sector in the next five years. Due to the estimated growth of infrastructure development and construction related activities, the demand for metal recycling will grow in this sector, the researchers are confident.

More information on the report “Metal Recycling Market by Metal Type (Ferrous, Non-Ferrous), Scrap Type (Old Scrap, New Scrap), End-Use Sector (Construction, Automotive, Equipment Manufacturing, Shipbuilding, Others), Equipment (Shredders, Granulating Machines, Others) – Forecast to 2020” is available at ➔ [www.fastmr.com/prod/1098957\\_metal\\_recycling\\_forecast\\_2020.aspx?afid=501](http://www.fastmr.com/prod/1098957_metal_recycling_forecast_2020.aspx?afid=501).

Photo: O. Kürth



# Waste Management: Arab Countries Are Looking for Solutions



Currently, the most likely interest in the Arab countries is to produce energy from waste. For most of these countries (not all of them profit from the rich oil reserves) it is a long way to go before a functioning waste management concept is fully operational. The political turmoil and military struggles in North Africa and the Middle East do not make these tasks any easier.

**W**aste management systems are still in the early stages of development in almost every Arab country, although many governments have begun to recognize the problems and look for solutions. The legal frameworks are generally too vague or too instable to monitor progress in the standardization and to perform efficiency controls.

Egypt thus lacks purposeful technical and organizational concepts. As a result of this, there are therefore only a handful of independently led treatment facilities whose operating has not yet managed to produce proof of its reliability. Large cities resort to modern disposal sites, the few recycling materials that are available are bought by customers both home and abroad. There is a lack of waste management plants and there is no indication of a thermal recovery. Basic disposal solutions are subject to the control of the communes promoting the interest in mechanical-biological facilities. Consequently the specified projects to date consist mainly of mechanical treatment facilities for recycling material used home and abroad and for high caloric fractions for combustion in cement plants. Foreign companies only have market opportunities if they provide highly developed technologies.

## Partly bad experiences

In the past 20 years some treatment facilities have been built in Saudi Arabia, of which several were only operated for a short space of time. The deposition on modern landfill sites and the combustion of medicinal waste are the primary forms of disposal. Bad experiences were made with mechanical-biological treatment (MBT) solutions due to technical defects, incorrect operations and faulty procedures and resulted in the facilities being shut down. A

further aspect is a legislation that makes the introduction of ecologically sensitive MBT concepts difficult despite the prospect of changes. According to expert opinion, local firms are incapable of designing, building or operating suitable facilities. On the other hand, technically sophisticated projects can only be realized on a large scale when implemented under foreign aegis.

Kuwait complains likewise about bad experiences with MBT. The only facility there in place is merely run occasionally and the decision-makers are critical of the technology. Kuwait is however extremely interested in German waste-disposal technology and there are joint activities between the University of Rostock and Fraunhofer Umsicht Institute. It has been considered whether the problem of the high organic percentages in the Kuwaiti residual waste can be tackled in a waste incineration plant. However, it remains uncertain.

The United Arab Emirates also report difficulties with waste disposal. The recycling rate in community waste lies below the ten percent mark whereby over 90 percent is disposed. Until now, there has been no installation of a treatment plant, merely a project which serves the registration and collection of dangerous goods. The problems of the Emirates lie in their limited experience with relevant projects and technologies. Furthermore, there are disagreements as to whether and how a future disposal system can be financed through waste disposal charges.

## First mechanical-biological treatment plants

The treatment of residual waste cannot be dealt with in a single facility in Jordan. However, landfill sites and waste

transfer stations form the main points with which the financing with World Bank is cooperated. European engineers have been contracted to develop concepts and feasibility studies for the reutilization of recycled materials, the production of substitute fuel for the cement industry and biological waste treatment. In the near future, projects with simple mechanical processing and aerobic treatment – for which there is a demand – could be developed.

A mechanical-biological facility for the production of substitute fuel, supported by the German KfW Bank, is being planned for the capital Amman. Jordan also has to battle with refuse problems due to the flood of Syrian refugees. The Society for International Cooperation is currently working on a suitable solution for this issue.

Lebanon has a number of smaller treatment plants for sorting and composting that are mostly badly planned. Due to the lack of space and thus the lack of dumping possibilities, there is a trend towards waste incineration in cement works for example. Since 2005, Sidon or Saïda is the only place in which a modern mechanical-biological treatment plant with an integrated wet fermentation level is being built, but it has only been in usage since 2013 due to the problematic industrial engineering. Tenders to deal with refuse collection, removal and treatment have been planned, not least because of the flood of refugees from Syria.

In Tunisia plans (with the support of the German KfW and other countries) do exist but there is no existing facility for the treatment of residual waste. There are however good opportunities for the operation of MBT technology. The waste disposal authority ANGED has started a first pilot system in cooperation with the KfW as well as local and international companies. Wolfgang Müller, from the University of Innsbruck (Austria) who supervises the research projects, reports that due to the facility 60 to 80 percent of the landfill site's volume is lessened, greenhouse gas emissions reduced, the emergence of leachate is sunk and the production of substitute fuel for industry such as cement works can be incorporated.

Oman has issued a tender for the controlled management of its contaminated waste. The country's waste disposal authority – "be'ah" – is working towards progress and is planning a mechanical-biological treatment plant which has the capacity to deal with 300,000 tons per annum. Solid waste transshipment stations are to be equipped in the same way as the concept "Waste to energy to water". The General Director of the Omani Environmental Authority, Sheik Mohammed S. Al Harthy, recently visited companies in Germany's Rhineland-Palatinate to gain information regarding electronic waste, construction waste recycling, the professional dealing with hazardous waste and the establishment of an application-orientated recycling economy in Oman.

## Qatar Intends to Increase Waste Management Plant Capacity

**Among the member states of the Gulf Cooperation Council (GCC), Qatar is one of the rapidly growing nations.**

The country is generating a total of 1.6 to 1.8 kilogram per day and per person of solid waste; this number is predicted to reach 19,000 tons per day in 2032. With an annual growth rate of roughly 4.2 percent out of which 30 percent is generated by households and the remainder is comprised of construction and demolition materials, only three percent is recycled, four percent is incinerated while the remaining is disposed into landfills. The landfills in Qatar are running out of space and new engineered landfills need to be created.

Therefore, the government aims at raising the recycle share from eight percent to 38 percent of solid waste, reducing landfill to 53 percent and converting waste to energy. "Energy conservation is a must, as the energy resources are finite, and their consumptions are increasing at alarming rates," reported Nispana, when the company announced the "2nd Annual

Waste Management & Recycling Summit Qatar", scheduled on the 3 to 4 February 2016 in Doha. "The country depends on desalted seawater, which consumes extensive amounts of energy, and is produced by using the least energy efficient desalting system."

During the event, Safar Mubarak Al Shafi, representative of the Ministry of Municipality and Environment in Qatar, announced plans to expand the capacity of the Domestic Solid Waste Management Center (DSWMC) from 2,300 to 5,300 tons of waste a day, as well as build another center with a capacity of 3,000 tons a day. Like its predecessor, the new waste treatment facility being planned would be designed in keeping with the most advanced technology in the world, the publication "The Peninsula" reported.

The DSWMC on a three square kilometer area in Mesaieed is considered as a pioneering facility. "It is the first

and only waste-to-energy plant in the Middle East. It is unique in the world because it is integrated, having all facilities for recycling in one place – incinerator, composting plant, segregation area, landfill and energy recovery," Safar Mubarak Al Shafi, Director, General Cleanliness Project, Mechanical Equipment Department and Waste Treatment Center, was quoted.

According to the "Gulf Times", the facility, built in 2011, generates approximately 30 megawatt of power. While 25 megawatt goes to Qatar General Electricity and Water Corporation (Kahramaa), the remaining five megawatt is consumed by the facility itself.

As reported by the media, about 3,000 tons of waste is generated in Qatar per day. Roughly 2,200 tons of waste is collected through the ministry's General Cleaning Project and about 600 to 800 tons by the private sector from commercial buildings.

## Plastic Recycling in the Gulf Region

The new Gulf Packaging and Polymers Show (GPPS) in Abu Dhabi, which took place from February 1 to 3 this year, was launched for the packaging industry in the Middle East to serve a market worth billions of US-Dollar.

According to a market research by Smithers Pira, headquartered in Surrey (United Kingdom), the packaging sector in the Middle East and North Africa (Mena) region is forecasted to grow to 52.4 billion US-Dollar by 2019 from the current level of 41 billion US-Dollar. Prior to this event, the media reported that in the member states of the Gulf Cooperation Council (GCC) – a political and economic union of Saudi Arabia, Kuwait, the United Arab Emirates (UAE), Qatar, Bahrain and Oman – ten percent of used plastic is recycled.

This rate is most likely to increase, because the Middle East packaging market is growing at a fast pace, reported Dr. R. Rangaprasad, director of SIES School of Packaging & Packaging Technology Center in Mumbai (India), in an interview with GPPS. According to the expert, the packaging industry in the UAE, one of the largest in the Middle East and North Africa, is expected to be worth 2.3 billion US-Dollar by 2016, a study with regard to the sector in the UAE found. "A recently published report on the packaging industry in the UAE compiled and published by BRICK DATA indicates that the industry will see commendable growth in the coming years", he told GPPS. According to the report, the country's GDP (Gross Domestic Product) would rise to 80,084 US-Dollar in 2016, "which indicates

that there will be a huge increase in domestic consumption and activities in export market".

### Benefits of plastic recycling

Dr. R. Rangaprasad supports the concept of recycling, because there are a lot of benefits. One good reason to recycle plastic is that recycling plastics reduces the amount of energy and natural resources (such as water, petroleum and natural) needed to create virgin plastic. "According to the American Plastics Council, the production of plastics accounts for four percent of U.S. energy consumption, and 70 percent of plastics in the United States are made from domestic natural gas," he told GPPS. "Recycling plastic products also keeps them out of landfills and allows the plastics to be reused in manufacturing new products. Recycling one ton of plastic saves 7.4 cubic-yards of landfill space."

But there are boundaries: "Effective recycling of mixed plastics waste is a major challenge for the plastics recycling sector. The advantage is the ability to recycle a larger proportion of the plastic waste stream by expanding post-consumer collection of plastic packaging to cover a wider variety of materials and pack types. Product design for recycling has strong potential to assist in such recycling efforts", Dr. R. Rangaprasad said. "Hence, wider implementation of policies to promote the use of environmental design principles by industry could have a large impact on recycling performance, increasing the proportion of packaging that can economically be collected and diverted from landfill. The same logic applies to durable consumer goods designing for disassembly, recycling and specifications for use of recycled resins are key actions to increase recycling."

Most post-consumer collection schemes are for rigid packaging as flexible packaging tends to be problematic during the collection and sorting stages, he told GPPS. "Most

current material recovery facilities have difficulty handling flexible plastic packaging because of the different handling characteristics of rigid packaging. The low weight-to-volume ratio of films and plastic bags also makes it less economically viable to invest in the necessary collection and sorting facilities. However, plastic films are currently recycled from sources including secondary packaging such as shrink-wrap of pallets and boxes and some agricultural films, so this is feasible under the right conditions. Approaches to increasing the recycling of films and flexible packaging could include separate collection, or investment in extra sorting and processing facilities at recovery facilities for handling mixed plastic wastes. In order to have successful recycling of mixed plastics, high-performance sorting of the input materials needs to be performed to ensure that plastic types are separated to high levels of purity; there is, however, a need for the further development of end-markets for each polymer recycle stream."

According to the expert, the effectiveness of post-consumer packaging recycling could be dramatically increased if the diversity of materials were to be rationalized to a subset of current usage. "For example, if rigid plastic containers ranging from bottles, jars to trays were all PET, HDPE and PP, without clear PVC or PS, which are problematic to sort from co-mingled recyclables, then all rigid plastic packaging could be collected and sorted to make recycled resins with minimal cross-contamination. The losses of rejected material and the value of the recycled resins would be enhanced. In addition, labels and adhesive materials should be selected to maximize recycling performance. Improvements in sorting/separation within recycling plants give further potential for both higher recycling volumes, and better eco-efficiency by decreasing waste fractions, energy and water use. The goals should be to maximize both the volume and quality of recycled resins."



The Middle East packaging industry is poised for strong growth – with a positive effect for plastic recycling (Photo: Karim Schwanke)

# Namibia: Long-term Market Opportunities Ahead



Photo: © Nikovrmoto | Dreamstime.com

15 years ago, the waste management sector in Namibia employed approximately 900 people, half of them in Windhoek alone. Recycling in one form or another took place in 24 of 35 local authorities, most carried out by scavengers; eight of 35 local authorities took materials to recycling enterprises. The State of Environment Report estimated a waste generation of approximately 0.5 kilogram per person and day on average, ranging from 0.33 kilogram for people in the low income portion of the population to 0.68 kilogram per person and day for people with high income. In Khomas in the middle of Namibia and centered in the capital city Windhoek, the waste generation amounted to 52,000 tons per year, while some regions in the South reached only 5,200 tons per year.

Extrapolated from a domestic waste sample of Windhoek, total waste quantity generated in Namibia per year included 46,000 tons of paper, 36,000 tons of plastic, 29,000 tons of glass and 11,000 tons of metals. But only a fraction of less than five percent was exported to South Africa for recycling each year. It must be added, that approximately 4.4 to 5.5 million liters per year of used oil were disposed of inappropriately, and an additional 1.2 to 1.4 million liters of used oil were recovered for re-use. Only a small fraction of generated 16 tons of medical waste per year were disposed of appropriately, in functioning incinerators and hazardous waste cells.

A developing country in southwestern Africa, formerly called South West Africa, Namibia is almost twice the size of California and has a population of approximately two million. The country gained its independence from South Africa in 1990. Some regions in the country's south exemplify apartheid land policy from when South Africa ruled Namibia. Besides that, these districts have a very arid climate

and the population density of the Hardap region is lower than in the other regions in Namibia. A case study of Keetmanshoop showed that waste management in these towns was inefficient and inconsistent. The improper waste management practices were mainly due to an often delayed or non-existent communication. And a study by the Worcester Polytechnic Institute for the Desert Research Foundation of Namibia found out, that in the communities Gründorn South and Nico Noord the waste was filled in bins or containers or filled up to a disposal site. When the bins were filled up, the waste was lit, same as with the waste in the open stocking area. As the study states, burning was still the primary method of disposal in these regions in 2012. Glass bottles were the only product to be consistently recycled.

## Windhoek: the cleanest city

Not so Windhoek. Since several years, the city is widely recognized as one of the cleanest cities in Africa and puts

strong emphasis on protecting and improving this status. Its aim was and is to progressively graduate from a clean to a green city, depending on a well-functioning waste management system. The vision of Windhoek's Solid Waste Management Division: "To be a world class solid waste management service provider to our people and become the cleanest City in the World by 2030".

In 2008, the Windhoek municipality began formulating a solid waste management policy. Two years later, the city launched a Solid Waste Management Policy under the theme "Moving towards a green City" to provide a framework within which waste can be managed effectively to minimize and avoid adverse impacts brought about by unnecessary waste generated and improper waste practices. Waste minimization involves the avoidance of generating waste in the first instance, and where waste cannot be avoided, it refers to minimizing waste to landfill through alternative methodologies, e.g. recovery, re-use and recycling (the 3 R's).

## The Clear Bag system

In 2010, Windhoek saw the launch of the Clear Bag Household Recycling project in partnership with recycling firms Enviro-Fill Namibia and Rent-A-Drum. The Clear Bag System requires residents to separate paper, glass, plastics and cans from the rest of their household waste into clear bags for recycling. Rent-A-Drum collects the recyclables weekly and sorts them at the Rent-A-Drum Material Recovery Facility (MRF) into various categories. Windhoek sorting station is employing a staff of 130 people and is able to process up to 1600 tons of waste per month. On the waste be sorted, 20 percent of the input cannot be recycled and need to be landfilled. Almost all the recyclables are contained or bailed, sold and sent to South Africa for recycling.

Disposal – in a very organized and professional manner – is done at Kupferberg landfill, providing maximum yields of materials and income. Situated in the southwest of the city and approximately eleven kilometers from the city centre, the site stands for the disposal of general and hazardous waste, generated within the city of Windhoek's area of jurisdiction. The general site has been in existence for over 20 years, while the hazardous site was commissioned in 1998.

## E-waste collection introduced

In early 2012, the Transworld Cargo Pty Ltd launched a pilot program to see whether e-waste collection would be feasible in Namibia. Successfully tested, the company in partnership with the City of Windhoek introduced an e-waste management solution for Windhoek in October 2014. In the heart of the partnership program stood the raising of awareness amongst the city's residents and business community on the availability of an environmentally and economically beneficial recycling solution for e-waste. The program covers office equipment, consumer electronics and household appliances. The collection service does not include CFC containing fridges, collected batteries,

light bulbs, compact fluorescent lamps, items containing asbestos, oil heating installations, specialized medical equipment or smoke detectors. According to Windhoek's Solid Waste Management Division, apparently 70 percent of the material stream can be recycled with a remainder of 30 percent to be disposed of at landfill site.

In August 2014, the City of Windhoek commissioned a Registration System for Waste Generator at their Solid Waste Management Division. Waste generators of more than five tonnes of general waste per month are required to be registered. "There is a lack of information pertaining to the quantities and types of waste generated and there is limited waste tracking systems in place to ensure that waste is transported to approved facilities for disposal," the online-magazine All Africa cites the Deputy Mayor of Windhoek, Muezee Kazapua.

## 2.7 kilogram of waste per day

However, according to the City of Windhoek Solid Waste Management department, it is estimated that every Windhoek citizen produces approximately 2.7 kilogram of waste per day, totalling 870 tons of waste per day.

Investigating the municipals Solid Waste Management Policy, the International Labour Organization launched a report analyzing the system of small- and medium-sized enterprises of so-called "ward contractors", commissioned for the provision of cleaning and collection services to Windhoek. The figures published 2013 indicate that the largest part of the waste collected every day is paper and cardboard, followed by glass. Sand with approximately 12.3 percent is followed by recyclable and non-recyclable plastics as well as cans, estimated to make up slightly more than ten percent of the collected waste. Garden refuse, food/scraps, dung/excrement, as well as mixed waste account for approximately ten percent of the waste collected. "Other items that were mentioned included used household items such as fridges, mattresses or furniture, clothing, iron, metal carcasses, bones, ash and coal, as well as batteries."

## The Recycle Namibia Forum

Meanwhile, the idea of recycling has found support. The Recycle Namibia Forum (RNF) was started in an informal way by Namibia Breweries Ltd, City of Windhoek, Rent-A-Drum, Collect-A-Can, 4H-Namibia, Plastic Packaging and Nuevas Ideas Consulting, was established in 2008 and joins forces on a voluntary basis to promote and facilitate recycling in Namibia.

The non-political and non-profit making association has the mission "to make Namibia the country in Africa that achieves the highest success in promoting the 3 R's of Recycling, Reusing and Reducing" and the vision „to successfully implement projects that raise awareness and change the behaviour of Namibians to embrace the 3 R's". Since that time enterprises from other branches – like Enviro Fill, Lori Ink, Namibia Dairies, SAPPI re-fibre and the Glass Recycling Company – have entered membership. Now 19

industrial players are listed, covering a wide range of recycling materials and operating throughout the country. So the idea of recycling has begun to spread across Namibia.

### Great regional differences

One of the latest reports on the subject was titled „Paving the way for recycling“, edited by the Recycle Namibia Forum and supported by the Environmental Investment Fund of Namibia. The report had to admit that „currently Namibia does not have national statistics or centralized data on recycling, and the information that is available is very limited and fragmented. Applying international models and assumptions is also problematic as Namibia is very unique in terms of its population distribution, high income disparity, and large differences between consumption and waste patterns in urban and rural areas.“

However, an average of 0.6 kilogram of waste per person in rural areas and three kilogram per person in urban areas was assumed, which meant an average of 3,000 tons of waste daily or about one million tons per year being produced in Namibia. The City of Windhoek Solid Waste Management department estimated approximately 2.7 kilogram of waste per citizen and day, totalling 870 tons of waste per day. According to Rent-A-Drum, 60 tons of recyclables are collected daily, which would translate into a recovery rate in the City of Windhoek of 6.9 percent.

Another survey, conducted by the University of Namibia, the Finnish Embassy and Rent-A-Drum in 2013, showed great regional differences in landfilling volume and types.

While northern communities like Ondangwa and Ongwediva send 70 tons of recyclables to landfill every week, coastal towns like Swakop/Henties Bay or Walvis Bay dispose of 150 tons of recyclables each, including some 30 tons of bags, between 22 and 28 tons of glass, about 35 tons of carton, more than 30 tons of paper and nine tons of PET bottles.

### Only a small market?

Currently 80 per cent of Namibia's waste is sent to South Africa for recycling, apart from Polysulfone plastic products that are processed by Polymer Recycling Manufacturers (PRM) at Okahandja, wrote The Namibian in 2012. The administrator of the Recycle Namibia Forum, Wolfgang Schenck, was cited with the statement, that PRM processes 60 percent of the recycled plastic in Namibia and serves 85 percent of the country's plastic product needs. But he underlined that setting up properly functioning collection center with bigger capacity is prohibited because of the low prices of waste.

It seems that there is only a small market for recyclable plastics in Namibia, as the waste paper, glass and metal scrap are sold South Africa or exported overseas: Successfully, Collect-A-Can Namibia recorded the "recovery" of 1,181,900 tons of used beverage containers in 2012. But there are initiatives. The Executive team of collector Fatima Plastics is currently looking to expand further into the rest of Africa given the success of their manufacturing operation in Namibia. Rent-A-Drum is aiming to do their own recycling by building a tissue plant to produce lavatory

3rd SYMPOSIUM ON URBAN MINING AND CIRCULAR ECONOMY  
23-25 May 2016 - Old Monastery of Saint Augustine, Bergamo (IT)

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**ORGANIZED** by  
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Following the huge success of its second edition in 2014, which registered the participation of more than 200 delegates from 40 different countries worldwide, **SUM2016 - 3rd Symposium on Urban Mining and Circular Economy** will be held in the suggestive former Monastery of Saint Augustine in Bergamo's upper city, in May 2016. SUM 2016 will focus on the concept of Urban Mining and the need to look beyond separate collection and the current logic of consumers responsibility, resulting in an increased recovery of resources, better quality of the same, improved environmental protection, involvement of producer responsibility and lower costs for society.

For further information on the Symposium please contact the Organisers:

**Eurowaste srl**, Via Beato Pellegrino 23, 35137 Padova, Italy / tel: +39 049 8726986 / info@eurowaste.it / info@urbanmining.it

Continuously updated information is available on the official Symposium website: [www.urbanmining.it](http://www.urbanmining.it)

paper that would use only recyclable paper. According to Wolfgang Schenck, new entrants into the recycling business are supported by loans through the Development Bank of Namibia for acquiring trucks for waste transport to South Africa.

As the Environmental Investment Fund of Namibia found out, „most businesses indicated that they barely cover their costs; all believe that with more effort, it could become viable“. In all categories of recyclables, the potential for increased recycling successes were mentioned. Challenges and obstacles were identified in transport and logistics, the predominance of balers in the machinery, the access to more sources of recyclables for bigger volumes and the training of staff. Amongst others, additional infrastructure is needed.

### A much-needed level of environmental protection

A comprehensive national waste management policy could stimulate the economy too. Back in 2001, the „State of Environment Report on Waste Management and Pollution Control“ edited by the Ministry of Environment and Tourism assessed the existing legislative as „outdated, fragmented and sectoral rather than integrated“ and with little opportunity for public participation. It was mentioned that at least eight government ministries dealt with waste management and pollution control. A dissertation dated 2006 points out that laws governing waste management in Namibia are „inadequate and ineffective“ and that the national legislative framework is „fragmented with no uniform standards. The society is not even aware that there are laws governing waste management in Namibia.“

At 27th of December 2007, the long awaited Environmental Management Act passed the parliament, but came into force not until February 2012. The Environmental Assess-

ment Professionals of Namibia applauded the act providing „a much-needed level of environmental protection in Namibia“. For Raili Hasheela, editing his dissertational thesis at the Universidad Azteca in 2009, the implementation of this framework was too tardily. He wrote: „At the moment, it is a bit discouraging that there is a slow process in implementing some of them [elements of governance for promoting sustainable development], despite the fact that they are the guiding frameworks for the implementation of various environmental activities. Such a process needs to be speeded up.“

### The opportunities are significant

Nevertheless, Raili Hasheela argued that „waste management remains a priority for the government, with different government ministries being involved in formulating policies and strategies for dealing with waste and its management.“ And he added, that Namibia is still “in its early stages of development“. But the Environmental Investment Fund judged on balance: “While recycling in Namibia is still in its infancy, and has faced numerous constraints and challenges, the opportunities to considerably increase recycling within Namibia are significant. As a result of the funding and support by the EIF, as well as with the contribution of the members of the Recycle Namibia Forum, a number of exciting initiatives have been identified in the RNF Strategic Framework, and will be driven as a means of creating positive change.“

And Patricia Hoeksema, chairperson of the Recycle Namibia Forum, likewise acted optimistic at the Environmental Compliance Conference in April 2015: “Through commitment and collaboration we can overcome the challenge of distances, low volumes, lack of sorting and containment, and transportation – to help make Namibia the African country with the highest success in reducing, reusing and recycling.“

## Good Prospects for Waste Paper Management

According to a new report\*), published by the Indian-based company MarketsandMarkets, the worldwide waste paper management market has been growing proportionally with the increasing environmental concerns among people and enforcement of stringent environmental laws and regulations. The paper industry has been dominated by North America for more than a century now. As reported, North America is still the largest producer as well as consumer of paper and paper products with a yearly per capita consumption of 487 pounds (about 221 kilograms) of paper. “This region also enjoys significant availability of fiber resources, which enables it to hold the highest position in the global export of pulp and waste paper,” MarketsandMarkets writes. “The U.S. ranks first in pulp and paper manufacture and exports, globally, followed by Canada.” According to the market research firm, the global waste paper management market is projected to be valued at around 43.35 billion US-Dollar by 2020 and to grow at a Compound Annual Growth Rate (CAGR) of 2.55 percent from 2015 to 2020. The commercial sector as a source of waste paper is projected to grow at the highest CAGR from 2015 to 2020.



Photo: O. Kurth

More information:

➔ [www.marketsandmarkets.com/Market-Reports/waste-paper-management-market-139478765.html](http://www.marketsandmarkets.com/Market-Reports/waste-paper-management-market-139478765.html).

\*) „Waste Paper Management Market by Service & Equipment (Collection & Transportation, Recycling, Incineration, Disposal), Recovery (Containerboard, Newsprint, Tissue), Source (Commercial, Industrial, Residential), Paper Grade - Global Forecast to 2020“

## Netherlands: ARN's Solution for Automotive Shredder Residue

According to Dutch-based ARN, it is the first company to operate the new CCM20RT delamination mill which makes a big step forward in power and size.

As an experienced processor of Automotive Shredder Residue (ASR) in the Netherlands, ARN is producing non-ferrous metal concentrates using sinkfloat techniques. The metal products separated by these systems typically include metals not easily recovered earlier in the ASR system by magnets and eddy current separators. The composition is a mix of cable, hair wires, plugs, connectors, PCB, plastic and organic residue. It took ARN one year to do all necessary trials with different separation techniques at recycling companies and machine manufacturers before building up a business case for recovering non-ferrous metals from ASR. "This comprehensive study showed that the swissRTec process was the way to go for fine copper recovery due to the balling and liberation effect of metals within the delamination mill", the company says.

### The swissRTec process

The SRT2 module produced by swissRTec, Switzerland, is a recent edition to the recycling plant located in Tiel (Netherlands). There is a high value associated with metal concentrate fractions destined for the SRT2 process; copper contents may vary from five to 25 percent. The main outlets for this metal concentrate include shipping

to Asia, reprocessing in Europe or in-house processing. When a recycler is producing a volume large enough then recycling in house becomes an attractive proposition.

Mario Zoellig, swissRTec's managing director, states that the system in Tiel adds to a growing number of references in the ASR field. "We see the ASR sector as active and growing at a time where many recyclers face difficult times due to declining commodity prices. Recovering the metals within ASR to a level where they can be sold to European refineries and smelters is a further step in the direction of a true circular economy and allows customers to derive maximum value from their material." The delamination mill is at the center of the swissRTec process and works on the principle of impact milling where materials are exposed to many collisions with the rotor, stator and other objects. Composite material such as cable comprises PVC and metal together. Metals become liberated and ball shaped after exiting the delamination mill and subsequent steps of screening and density separation produce clean metal fractions which can be sold directly to smelters or refiners.

The CCM20RT is based around the same design as its predecessors, the

CCM10 and CCM15 RT, however, with a two-meter rotor diameter and 630 kilowatt max power rating it makes a big step forward in power and size. "With the development of the CCM20RT machine swissRTec is able to deliver a high throughput plant with a high quality output to match," ARN emphasizes.

After delamination the material is screened in five size classes for further treatment at the density tables, which are separating a heavy non-ferrous metal mix and a light organic plastic mix. Loss of metals within the reject plastic fraction is – according to ARN – below two percent and can be further processed for higher recovery. The metal mix is further separated on the offline unit where heavy metals such as copper and brass can be separated from lighter aluminium. A magnetic fraction is also separated. "The experience of ARN is that the fine particle sizes, below 1.5 millimeter, give the highest copper grades," the Dutch recycling company reports. "A copper grade of 95 percent plus had been achieved and analysed by the copper smelter." The remaining plastic mix fractions should find a market as well, the management of the company is convinced.

➔ [www.arn.nl](http://www.arn.nl), [www.swissrtec.ch](http://www.swissrtec.ch)



ASR is a mix of cables, hair wires, plugs, connectors, PCB, plastic and organic residue



According to the Dutch processor, fine particle sizes give the highest copper grades

Photos: ARN/swissRTec

## New SRF Production Capabilities in South Korea

A new Solid Recovered Fuel (SRF) production facility is now fully operational in Wonju city, South Korea. Korean waste management specialist Zion has built the alternative fuel manufacturing plant to make smarter use of its residual materials. Now, with the new system in place, pre-sorted C&D and C&I waste is being shredded to produce a homogeneous 50 mm fuel for the cement industry.

The Untha XR3000C shredder with cutting concept was chosen following a series of trials at Untha's Austrian headquarters in Kuchl. Demonstrations showed the technology could comfortably achieve throughputs of 60 to 70 tons per day with scope to almost double that moving forward. As reported, Zion can accomplish a 40 to 50 mm particle size from the single step shredding of plastic bales, which has further boosted the company's SRF production capabilities.

Committed to principles akin to Europe's waste hierarchy, Zion extracts as many materials as possible – including bricks, metal, sands, glass and batteries – for re-use or recycling, prior to them entering this SRF manufacturing stream.

Adding some final thoughts, Zion's President Ms. Geumju Kim said: "Our family-run business is incredibly passionate about renewable energy, from solar power to alternative fuel



Photo: scriba / Untha

The Untha XR3000C shredder with cutting concept was chosen following a series of trials at Untha's Austrian headquarters

production. Now that our new SRF plant is up and running, with state-of-the-art configurable technology in place, the next step is to investigate relationships with different custom-

ers. We can satisfy varied specifications, and look forward to improving South Korea's resource agenda."

➔ [www.untha.com](http://www.untha.com)

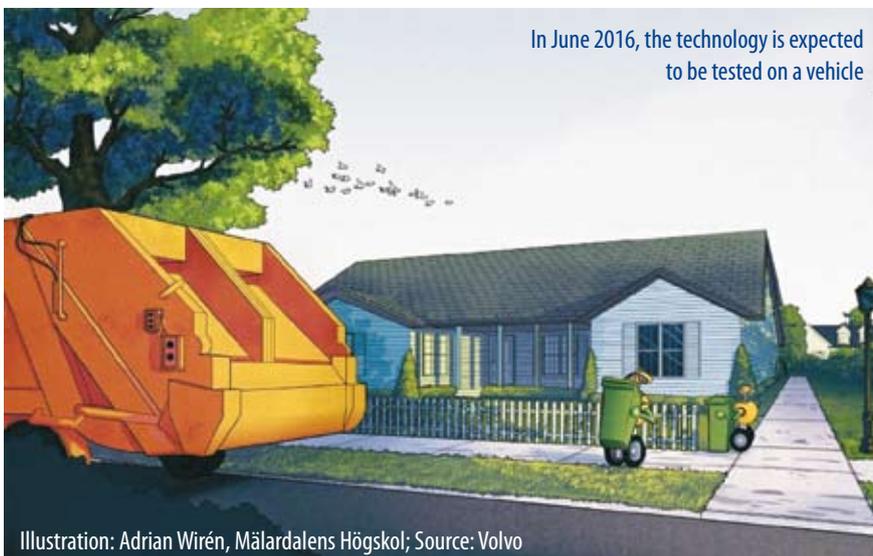
## ROAR: Joint Project to Develop a Robot for Refuse-Handling

The Volvo Group is working on a joint venture together with Chalmers University of Technology and Mälardalen University in Sweden, Penn State Uni-

versity in the United States, and the waste recycling company Renova to develop a robot that interacts with the refuse truck and its driver to accom-

plish the work. This activity will continue until June 2016, when the technology will be tested on a vehicle.

As reported, the project is called ROAR, for Robot-based Autonomous Refuse handling, and the goal is to introduce a robot that, with the help of instructions from a truck's operating system, can collect refuse bins in a neighborhood, bring them to a refuse truck and empty them. According to the Volvo Group, this occurs under the supervision of the refuse truck's driver, who can thereby avoid heavy lifting. "The purpose of ROAR is to demonstrate how we, in the very near future, will use smart machines to assist with a broad range of activities in society," the carmaker notes. "This technology can be applied in many areas. Refuse collection is just one example."



In June 2016, the technology is expected to be tested on a vehicle

Illustration: Adrian Wirén, Mälardalens Högskola; Source: Volvo

## Epson's PaperLab Turns Waste Paper Into New Paper

The Seiko Epson Corporation has developed what it believes to be the world's first compact office papermaking system capable of producing new paper from securely shredded waste paper without use of water.

Businesses and government offices that install a PaperLab in a backyard area will be able to produce paper of various sizes, thicknesses, and types, from office paper and business card paper to paper that is colored and scented. Paper as an essential communication tool is produced from a limited resource. As one of the leading companies in the world of printing, Epson has been deeply involved with paper used for its printer products. With this in mind, the company set out to develop technology that would change the paper cycle. With PaperLab, Epson aims to give new value to paper and stimulate recycling. In addition, recycling paper onsite in the office shrinks and simplifies the recycling loop. Users can expect to purchase less new paper and reduce their transport CO<sub>2</sub> emissions.

### Product features

- Office-based recycling process: Ordinarily, paper is recycled in an extensive process that typically involves transporting waste paper from the office to a papermaking (recycling) facility. With PaperLab, Epson is looking to shorten and localize a new recycling process in the office.
- Secure destruction of confidential documents: Until now, enterprises have had to hire contractors to handle the disposal of confidential

documents or have shredded them themselves. With a PaperLab, however, enterprises will be able to safely dispose of documents onsite instead of handing them over to a contractor. The machine breaks documents down into paper fibers, so the information on them is completely destroyed.

- High-speed production of new paper: PaperLab produces the first new sheet of paper in about three minutes of having loaded it with waste paper and pressing the start button. The system can produce about 14 A4 sheets per minute and 6,720 sheets in an eight-hour day. Users can produce a variety of types of paper to meet their needs, from A4 and A3 office paper of various thicknesses to paper for business cards, colored paper and even scented paper.
- Environmental performance: PaperLab makes paper without the use of water. Ordinarily, it takes about a cup of water to make a single A4 sheet of paper. Given that water is a precious global resource, Epson developed a Dry Fiber Technology.

Dry Fiber Technology consists of three separate technologies: fiberizing, binding, and forming. During fiberizing waste paper is transformed into long, thin, cottony fibers. This process immediately and completely destroys confidential documents. Since the



PaperLab does not use water, it does not require plumbing facilities. That, plus its compact size, makes it easy to install in the backyard of an office. At binding, a variety of different binders can be added to the fiberized material to increase the binding strength or whiteness of the paper or to add color, fragrance, flame resistance, or other properties needed for a given application. Forming new papers users can produce sheets of A4 or A3 office paper and even paper for business cards thanks to forming technology that allows them to control the density, thickness and size of paper.

Epson plans to put the new „PaperLab“ into commercial production in Japan in 2016, with sales in other regions to be decided at a later date. A developmental prototype of the PaperLab was demonstrated at the Epson booth at Eco-Products 2015, an environmental exhibition that took place at the Tokyo Big Sight (Tokyo International Exhibition Center) from December 10th to 12th.

Photo: Seiko Epson Corporation

## New Maintenance Platform to Increase Safety

Metso has developed a new maintenance platform that increases safety when changing wear parts in jaw crushers. It consists of hand rails which are also used for lifting the platform, sturdy work platforms and related control mechanisms, enabling them to be precisely placed at the desired height of the jaw opening. "The platform constructed of aluminum is easy enough for one person to move," the Finland-based manufacturer emphasized. "The maintenance platforms are available to match with



Metso Nordberg C-Series jaw crusher's maintenance platform

Photo: Metso

either single-piece or two-piece jaw dies." Metso has applied to patent the maintenance aid.

The family of maintenance platforms is available for all Metso Nordberg C-Series jaw crusher models C80 through C200. Due to their low weight (12 to 23 kilograms), they are easy to lift into position and remove, speeding up the work of changing parts, says the Finnish company.

➔ [www.metso.com](http://www.metso.com)

## Third European Aircraft Recycling Symposium

March 16-17, 2016, Stuttgart/Germany

As in 2013 and 2015, this symposium will provide an independent platform for exchange and discussion for any partner who is involved in the field of aircraft recycling. The event is providing a forum for discussion on the most recent trends in multiple aspects of

aircraft end-of-life operations. Current questions to be answered include the economic and technical situation of aircraft dismantling and recycling in Europe, as well as the most appropriate recycling technologies for composite materials or metals. Selected

presenters from industry, research, and administration will discuss these topics to draw a balanced picture about the current status and potential prospects for this industrial branch. More information and registration: [rcsymposium@hs-pforzheim.de](mailto:rcsymposium@hs-pforzheim.de)

## IARC 2016: How to Stop Illegal Export of ELVs

March 16 – 18, 2016, Berlin

The 16th International Automobile Recycling Congress IARC 2016 will be held from March 16 to 18, 2016 in Berlin, Germany. Delegates from industry, authorities and academia will discuss and present news and challenges of the manufacturing and end-of-life vehicle (ELV) business. The congress will bring together various links in the ELV recycling chain such as car manufacturers, metal and plastic scrap traders, recyclers, dismantlers, shredder operators and policy-makers from around the world. According to ICM AG, more than 250 international industry leaders will be expected. The opening of the congress will be made by two keynote speakers. Julian Allwood, Professor of Engineering and the Environment of the University of Cambridge will focus his speech on "Automobiles and sustainability: Bridging the gap between environmental security and



commercial reality" and Oliver Scholz, CEO of Scholz Holding GmbH, will talk about the topic "Stop export of end-of-life vehicles".

The main topics are:

- The role of different stakeholders in the ELV recycling chain
- Circular economy & resource efficiency
- Life cycle and sustainability aspects of car recycling

- Best available recycling technologies
- How can car manufacturers and the dismantling industry close the recycling loop?
- Life cycle and sustainability aspects of car recycling
- Next generation recycling processes and equipment
- Report on actions by global car manufacturers on how to facilitate achieving recycling goals
- Update on new laws and regulations
- Dismantling & Remanufacturing
- Future mobility – What will a car look like in 2030?

The congress program includes also a company spotlight and tech talks and a panel discussion on "Illegal aspects of legal export".

➔ [www.icm.ch](http://www.icm.ch)

Photo: O. Kirth

## European Plastics Recycling Show Rescheduled for March 22-23

The event had to be postponed in last November due to the security alert in Brussels and will now take place on March 22 and 23, 2016 at the new venue of Brussels Expo.

As before, the European Plastics Recycling Show is co-located with the working group sessions of Plastics Recyclers Europe (PRE) which will be open exceptionally to the public. The event will feature a Pan-European free-to-attend exhibition and a conference designed specifically for plastics recycling professionals. More than 65 companies and organizations are due to showcase the latest advances in European plastics recycling at the event's exhibition. The conference will examine a wide range of indus-

try themes including the economics of plastics recycling, the regulatory background, materials, processing, technology and innovation.

The European Plastics Recycling Show brings together key players to showcase innovative technology, share best practice, network and do business. A broad cross section of the industry will be represented 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. Industry body Plastics Recyclers Europe (PRE) is strongly supporting the exhibition and is organizing the conference in conjunction with Plastics Recycling Show Europe organizers Crain Communications.

Visitors who have not already done so can register to attend the first Pan-European exhibition and conference solely dedicated to plastics recycling at ➔ [www.prseventeurope.com](http://www.prseventeurope.com)

## REW Istanbul 2016

April 28-30, 2016, Istanbul

The 12th REW Istanbul will take place from 28th to 30th April 2016 in halls 13 and 14 of TÜYAP Beylikdüzü Fair and Congress Center, Istanbul. The fair is organized by İFO Fuarçılık with the support of the Turkish Ministry of Environment and Urbanization since 2005 and brings together professionals from across Eurasia under the main categories of recycling, environmental technologies, solid waste, waste water, waste gas and green energy. Some 350 companies from 27 countries are expected to exhibit and approximately 12,000 trade professionals are anticipated to attend to view and compare the latest technologies and services on offer.

Professionals that would like to keep up to date on this international event can register for free online at the official website [www.rewistanbul.com](http://www.rewistanbul.com). According to the organizer İFO



Foto: J. Szasz

Fuarçılık, REW Istanbul 2016 adds significant value towards achieving a sustainable environment. Companies who want to showcase their latest innovative products by exhibiting at this fair can also register online using the exhibitor request form.

REW Istanbul is recognized as an important event that creates added value in terms of reducing production costs of companies in the sector and

offers innovative and efficient systems that enable a 'circular economy' particularly for recovery of waste water and solid waste, generation of energy from waste, efficient raw material usage and energy saving.

For more information, companies that would like to participate in REW Istanbul 2016 and professional visitors that want to follow the event can visit [www.rewistanbul.com](http://www.rewistanbul.com).

## Gunter Pauli, Professor Takashi Nakamura and representatives from Volvo Cars and IKEA

Completely cross sectorial with representation from the basic, chemical and recycling industries, manufacturers, retailers and resource recovery experts and the academic world. We are proud to invite you to The Third Circular Materials Conference on May 11-12 2016 at Chalmers Conference Centre in Gothenburg, Sweden.

**Examples of Speakers:** Åsa Romson, Minister of Climate and the Environment, (tbc), Gunter Pauli, Keynote speaker, Professor Takashi Nakamura, Tohoku University and representatives from Volvo Cars, Boliden, IKEA, Electrolux and Stena Technoworld.

[www.circularmaterialsconference.se](http://www.circularmaterialsconference.se)

**CIRCULAR  
MATERIALS**  
CONFERENCE 2016



CCR  
Competence Centre  
RECYCLING

Nordic Publishing

May 11-12  
2016

# SUM 2016

May 23 – 25, 2016, Bergamo, Monastery of Saint Augustine

Following the huge success of its second Symposium in 2014, which registered the participation of more than 200 delegates from 40 different countries worldwide, SUM 2016 – the 3rd Symposium on Urban Mining will be held in the former Monastery of Saint Augustine in Bergamo's upper city, from 23rd to 25th May 2016. The Symposium in Italy, organized by IWWG – International Waste Working Group/ Eurowaste S.r.l., will focus on the concept of Urban Mining and the need to look beyond separate collection and the current logic of consumer responsibility, resulting in an increased recovery of resources, better quality of the same, improved environmental protection, involvement of producer

responsibility and lower costs for society. This conference will include oral sessions, a poster session and a technical tour at a real scale plant dealing with post-consumer plastic packaging.

The three-day Symposium will include the following topics:

- Sources and characterizations of materials and energy resources in urban spaces;
- Municipal Solid Waste, commercial waste, industrial waste, WEEE, depuration sludge, municipal and industrial sewage sludge, demolition waste, food waste, scrap tires;
- Automotive Shredded Residues;
- Techniques of waste source separation;

- Criticality of the current system of separate waste collection;
- Take back programs;
- Recovery centers (eco points, tip shops, waste banks, etc.);
- Technologies for the extraction of materials and resources;
- Valorization of materials and resources;
- Recirculation pathways and markets;
- Landfill mining;
- Economic and financial aspects;
- Policies and legal aspects;
- Environmental balances (Life-cycle assessment);
- Case studies.

➔ [www.urbanmining.it](http://www.urbanmining.it)

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FACTORIES FOR INDUSTRIAL RECYCLING OF MUNICIPAL WASTE**

# WASTE



**8 RAWs  
ECO-COMPOST  
RDF ENERGY**

## IS AN ECONOMIC RESOURCE OF REPUBLIC OF CROATIA

Waste is a global problem of a planet protection! It was found by Croatian, as well as EU strategy. There is no urban environment that completely solved the problem of waste. At the international conference in Copenhagen, the Secretary General of the UN, Ban Kimoon, said that the world must stop climate changes on the planet. At International conference held in Paris in the 2015, was asked for sustainable technologies.



- Organic waste treatment is intensive biological degradation within 6-8 weeks
- The rest of combustible waste RDF have to be pre-dried, shredded, baled into bales for energy source market
- In the process of waste treatment by MBT-T Tehnix technology there is no water nor air pollution
- It is necessary to build standard factories for mixed and municipal waste and pre-sorted waste treatment. Economic goals are: getting more raws, energy and working places
- Municipal waste treatment factories have to be built near larger landfills due to recycling of the same

Development of new technology we achieve complete recycling of mixed municipal waste. Politics, local government, citizens must support such intentions and implement them. The development of Tehnix MBT-T technology we achieve the goals of sustainable development, circular economy and targets of "zero waste". With the construction of standard factories for processing and recycling of municipal waste achieves economic, environmental, energy and social objectives of development of Republic of Croatia.

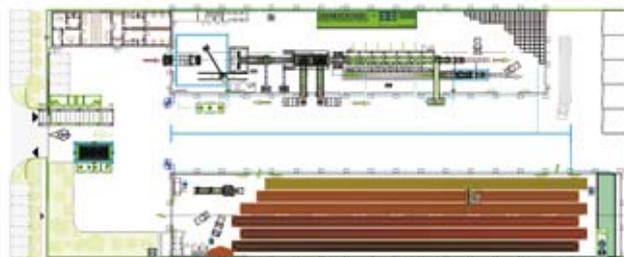
### What is the MBT-T technology of industrial treatment of mixed municipal waste developed and patented in company TEHNIX?

**MBT-T is a technological combination of mechanical, biological and thermal processes of mixed municipal waste treatment under controlled conditions of recycling and reuse as raw material and energy in the industry**

### With industrial recycling of municipal waste in MBT-T plant TEHNIX we get:

- A simple process of municipal waste disposal in households and enterprises
- Disposal in a one bin is carried out due further recycling process and reuse
- Disposal and collection is carried out in the most economical and the most appropriate way
- Deferred or separate waste must be moved as soon as possible from disposal to recycling
- The recycling plants must be built as close as possible due to the reduction of transport costs
- Recycling shall be done fast in a controlled environment without negative impact on the environment
- Waste shall be sorted to use-values and market needs in the industry
- It is necessary balling of raw materials and RDF, as smaller volume and moisture content for RDF fuel
- Costs of municipal waste recycling must be as small as possible per tonne of collected waste

- By construction of MBT-T we don't need new landfills nor devices for wastewater treatment
- By recycling we achieve political, economical & environmental objective, there is no rebellion of citizens, the satisfaction of all
- The global goal is - no climate change, no infectious diseases of citizens, creating of new social values, record an industry growth, get new raw materials for the circular economy and gain new energy for development and lower costs for citizens.
- Waste treatment in MBT-T facility is eco industry with "zero waste" target. Such projects are financed by EU funds and the World bank. Waste treatment factories are payable within 5 years, and their lifetime is minimal 25 years. By construction of such factories the price of waste treatment is significantly cheaper for the state, towns and citizens. MBT-T standard waste treatment factories are technological revolution in waste management. Energy consumption per tonne of treated mixed municipal waste is only 1 €/tonne. This is a sustainable future for state and nature, for citizens smaller work and higher standard. Such projects all win, it's a patent of company Tehnix No. P20110260A. Stop pollution of planet by sustainable waste management!



**The goal of responsible sustainable waste management is to skip disposal and to use waste as an extremely valuable resource**

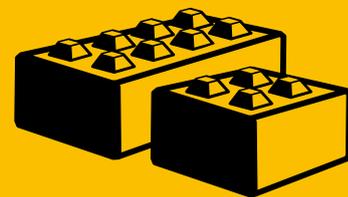
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**THE MBT-T IS AN INNOVATIVE TECHNOLOGY FOR INDUSTRIAL WASTE RECYCLING**

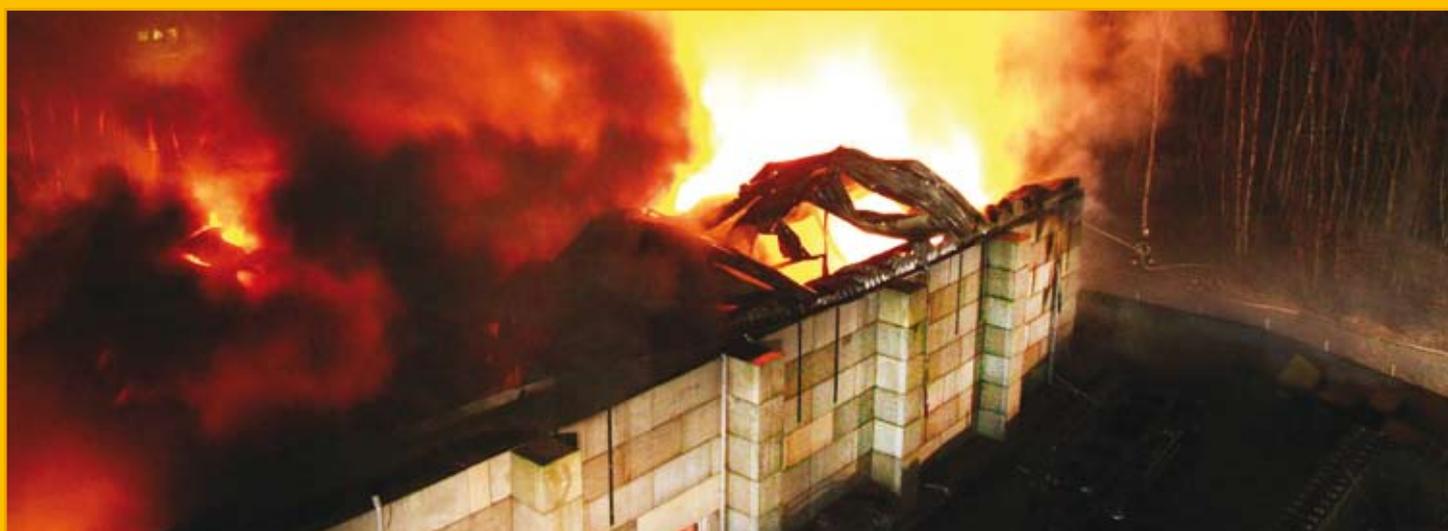
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