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# GLOBAL RECYCLING

*The Magazine for  
Business Opportunities  
& International Markets*



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## **Prime and Secondary Steel – new and used**

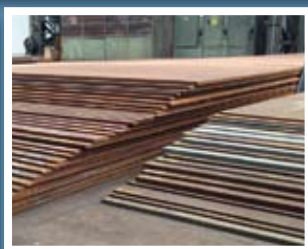
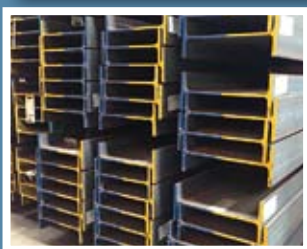
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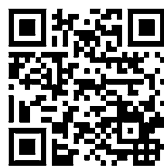
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## Viva Recycling!

*In March, the European Parliament (EP) voted on the Circular Economy Package and opened "a window of opportunities" for the sector, the European Federation of Waste Management and Environmental Services (FEAD) underlined in its commentary. "By setting very ambitious recycling targets, the European Parliament has given a clear signal for our members' companies who are amongst the leaders at global level in recycling and recovery. This regulatory push will pave the way to a circular economy in which our private companies play a key role by producing resources which can be re-injected in the economy and by supplying energy, thereby creating jobs."*



*Like other sector associations in Europe, FEAD argues that the regulatory push (targets) needs to be complemented by the creation of sustainable markets for these recycled materials which are globally traded commodities and are subject to volatile prices. For these secondary raw materials the demand and supply could be better compensated globally than locally.*

*Another positive feedback received the Parliament's vote on the Circular Economy Package (CEP) from the Association of European Producers of Steel for Packaging (APEAL); it gives a strong mandate to the EP in the trilogue discussion with the European Council and Commission. According to APEAL, swift implementation of the CEP would deliver numerous benefits, specifically "a harmonized EU approach, greater legal certainty and a more viable internal market".*

*Recycling and trading of raw materials provide many business chances – nationally and globally. However, the recycling industry is going through constant change and adaption, as has been pointed out by the Bureau of International Recycling's Latin America Committee some weeks ago. According to the information, the companies have to be prepared for possible shifts in raw material flows not only due to regular trade factors but also due to possible tariffs and protectionist policies that might be erected by different countries; products could be directed to the appropriate markets with a strong and sustainable demand.*

*The benefits of recycling have been recognized in many parts of the world. The situation in the European Union which is on the road to the circular economy is described from page 14 onwards. Furthermore, "Global Recycling" has asked Michael Schuy, President of the European Recycling Industries' Confederation (EuRIC), how the vision of a market-driven circular economy could become reality (page 18). As a Member State of the European Union, the Netherlands are seriously heading towards a circular economy (page 21). A further topic is the Brexit and its impacts on UK's residual waste arising and treatment capacity (page 24).*

*In Lebanon, where more than one million Syrian refugees live, there is a waste management policy wanted (page 26). And in India, a circular economy development path could create a high value, a new report says (page 4).*

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

Yours  
Brigitte Weber (weber@msvgmbh.eu)



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# Investment Plan for Europe

There are opportunities for investors in the EU and abroad: The Plan is intended to trigger 315 billion Euro in investment by 2018. It also applies to investments in the Circular Economy.

The European Commission and the European Investment Bank (EIB) proposed the Investment Plan for Europe in November 2014 as an initiative to fight economic weakness lingering from the 2008 financial crisis. One pillar of the Investment Plan is the European Fund for Strategic Investments (EFSI), which combines an EU budget guarantee and EIB resources. The other two pillars involve regulatory reform and technical assistance.

The EFSI finances a greater number of operations with a higher risk than the EIB previously did, attracting private investment and targeting market failures. The aim is "to overcome market failures by addressing market gaps and mobilizing private investment," the EU Commission informs on its homepage. It will support strategic investments in key areas as well as risk finance for small businesses.

According to the information, the Plan supports investments in the real economy, and therefore there are new opportunities available for

- institutional investors in the EU and abroad
- project promoters
- small and medium-sized enterprises (SMEs).

## Sectors financed

The European Fund for Strategic Investments (EFSI) is available for economically viable projects, including projects with a risk profile. It focuses on sectors which support sustainable growth and employment in the EU:

- strategic infrastructure (digital, transport and energy)
- environmentally sustainable projects (renewable energy and resource efficiency)
- urban and rural development as well as social projects
- education and training, research, development and innovation
- investments boosting employment, in particular support for smaller businesses and midcap companies

Photo: pixabay



Financial instruments under the Investment Plan are integrated into the European Investment Bank Group (☞ [www.eib.org/projects/cycle/applying\\_loan/index.htm](http://www.eib.org/projects/cycle/applying_loan/index.htm)).

## Three pillars

The Investment Plan for Europe consists of three pillars.

- The European Fund for Strategic Investments which provides an EU guarantee to mobilize private investment.
- The European Investment Advisory Hub and the European Investment Project Portal which provide technical assistance and greater visibility of investment opportunities and thereby help investment projects reach the real economy.
- Removing regulatory barriers to investments.

Under the first pillar, the market absorption has been particularly quick under the so-called SME window, where EFSI is delivering well beyond expectations, according to the EU Commission. To ensure that sufficient funding is available to continue providing finance to SMEs with EFSI support, the SME window was scaled up by 500 million Euro in July 2016.

Under the second pillar, the European Investment Advisory Hub (☞ [www.eib.org/eiah/](http://www.eib.org/eiah/)) was launched in September 2015. Project promoters, pub-

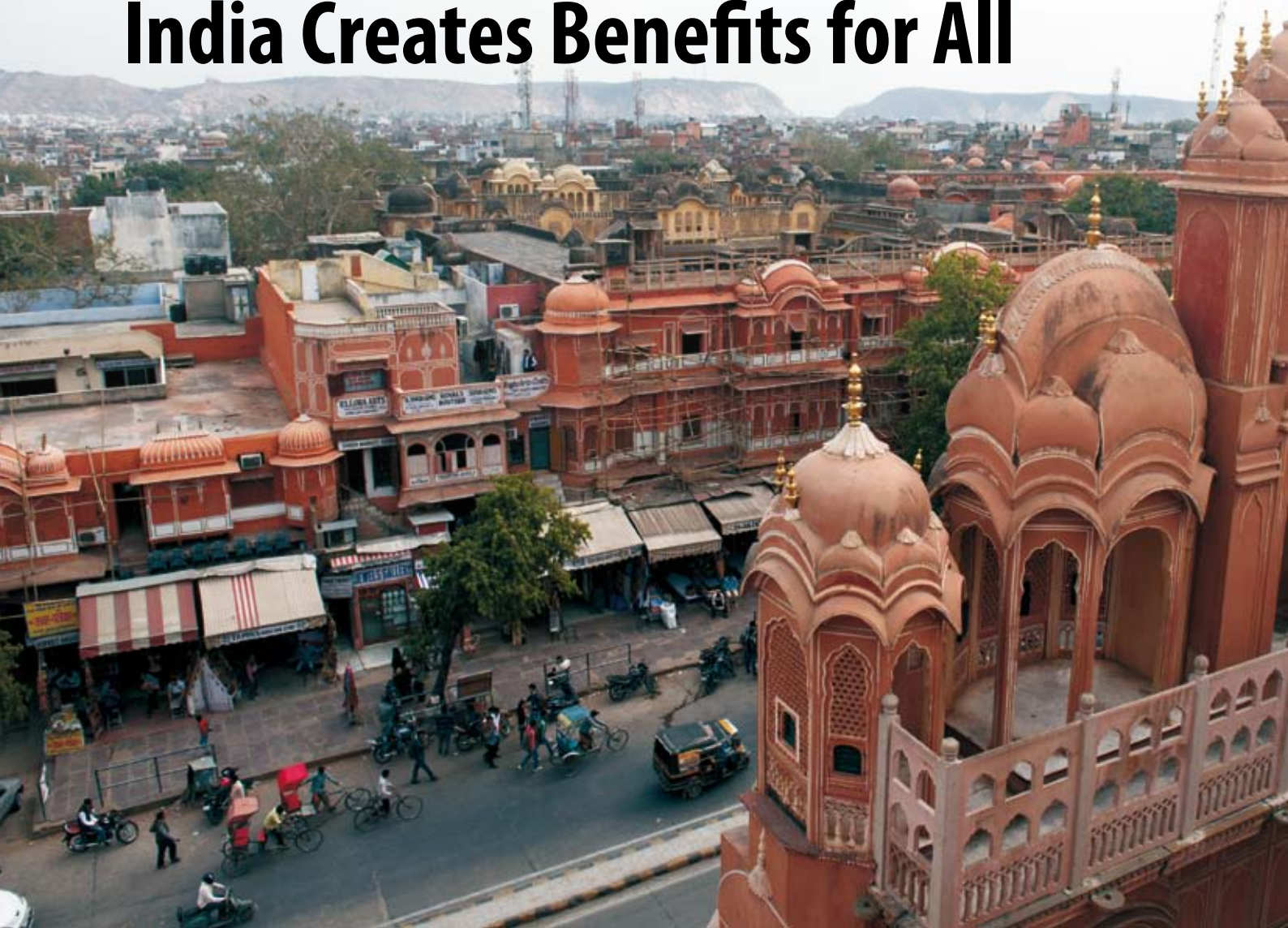
lic authorities and private companies can receive technical support to help to get their projects off the ground, make them investment-ready. They can get advice on suitable funding sources and access a unique range of technical and financial expertise.

In order to provide investors with more visibility about existing investment opportunities in the EU, the Commission has created the European Investment Project Portal (☞ <https://ec.europa.eu/eipp/desktop/en/index.html>), which went live in June 2016. Project promoters can submit their projects online, where they are matched with relevant investment opportunities.

In order to remove barriers to investment – the third pillar of the Investment Plan – the Commission has proposed concrete initiatives to help support investment and facilitate the financing of the real economy, such as lowering capital charges for insurance and reinsurance companies as regards infrastructure investments. "The Energy Union, the Capital Markets Union, the Single Market and the Digital Single Market Strategies, as well as the Circular Economy package all contain specific measures that will remove barriers, promote innovation and further improve the environment for investment, if fully implemented," the European Commission is convinced.



# Investment in Circular Economy in India Creates Benefits for All



Photos: pixabay

A circular economy development path in India could create annual value of rupee 14 lakh crore (US-Dollar 218 billion) in 2030 and rupee 40 lakh crore (US-Dollar 624 billion) in 2050 compared with the current development scenario. By adopting circular economy approaches, businesses could achieve material cost savings and increase their profits by lowering virgin water consumption, greenhouse gas emissions, transportation kilometers travelled and synthetic fertilizer and pesticide use. These are the key announcements of a new report on “Rethinking Growth for a Long-Term Prosperity” released by the Ellen MacArthur Foundation.

**T**he study identifies circular economy opportunities in three focus areas: cities and construction, mobility and vehicle manufacturing as well as food and agriculture. These areas cover the largest industrial sectors in terms of employment (agriculture and construction) and growth expectations (construction and vehicle manufacturing). The analysis investigated two development scenarios in 2030 and 2050 – the current development path and a circular development path. Both scenarios take into account projected increases in population, urbanization, and social shifts.

The circular economy has to follow three principles. The first is to preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows to face for example pressing challenges like droughts, waterborne diseases, water contamination and soil degradation. The second is to optimize resource yields by circulating products, components, and materials at their highest utility at all times including amongst others materials consumption, nutrients loss and wasting of products and materials. The third principle stipulates to foster system effectiveness by revealing and designing out negative exter-

nalities of economic activities including land degradation, pollution of air, water and noise, release of toxic substances and GHG emissions.

### Buildings as material banks

India must build 700 to 900 million square meters of new commercial and residential space every year. That opens opportunities to design buildings for material, water and energy efficiency. The study votes for an industrialized production, modularization, and standardization of components that can cut the time, cost, and materials consumption of construction and enable rapid building of affordable housing. For the construction sector the selection of regionally appropriate, renewable, non-toxic materials and retaining construction materials at their highest value is proposed. These technologies also support the use of buildings as material banks – identifying materials for reuse after building use ends and capturing value by keeping materials in tighter loops. The building design could include water-efficient fittings, rainwater capture, greywater cycling systems and wastewater solutions from the start and could be coupled with renewable energy resources.

Concerning the treatment of solid waste in Indian cities, the review suggests the informal sector to provide a starting point for developing effective reverse logistics to help create material flows addressing social challenges. But the informal sector workers typically collect non-organic waste at high-value, but leave low-value materials and organic matters largely discarded and untreated: Informal recycling activities are reported to handle a total of 4.7 million tons of plastics per year, while only 0.2 million tons are collected and recycled via public waste collection systems. So for non-organic waste, systemic initiatives can provide inspiration. The New Plastics Economy Initiative for instance is collaborating along value chains to close loops on plastic packaging.

According to the study, effective collaboration among suppliers, manufacturers, retailers, users, governments, and the informal sector could improve the management of nutrient and material stocks and flows. Overall, following a circular economy development path would generate annual benefits of rupee 4.9 lakh crore (76 billion US-



Dollar) in 2050, compared with the current development path. Resource use in the construction of new buildings would also fall, with 37 percent less virgin, non-renewable materials needed, 24 percent less water consumed, and 18 percent less inner city land used in the circular scenario compared with the current development scenario.

### Vehicles designed for reuse, remanufacture and recycling

The proposals for a circular economy development in India for this sector include the use of electric vehicles, car-sharing schemes, autonomous driving and smartphone apps offering route and transport options by taking into account traffic and weather conditions. Transport planning would diversify transportation modes and develop a multimodal system optimized by new technologies. Another focus lies on a high vehicle durability established by designing cars that can easily be maintained, repaired and kept in longer use. Designing vehicles for reuse, remanufacture and recycling closes loops of components and material. Vehicle manufacturers would develop new business models and revenue streams to profit from designing long-lasting, upgradable, and efficient vehicles. Manufacturers could collaborate with those currently handling repair and recycling, such as the informal sector, and would design vehicles for longer use and easier remanufacturing and recycling. Coupled with circular business models, such as a car as a service and not only as product, are estimated as even maximizing value capture for businesses. The scheme creates the necessary reverse logistics networks and gives manufacturers a reliable and economical supply of raw materials.

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Following a circular economy development path for mobility and vehicle manufacturing could generate annual benefits of rupee 31 lakh crore (482 billion US-Dollar) in 2050, compared to the current development path. Following the circular path would also reduce negative environmental impact, with 68 percent less GHG emissions from transportation and vehicle manufacturing and 82 percent less consumption of virgin materials. Per capita spend on mobility would decrease 50 percent.

### 71 percent less used fertilizers

Summed up, the study says that applying circular economy principles to the development of the Indian food system could create annual benefits of rupee 3.9 lakh crore (61 billion US-Dollar) in 2050. Digitally enabled machinery- and knowledge-sharing solutions as well as digitized food supply chains transmitting accurate market information could reduce GHG emissions, water usage and environmental degradation and furthermore play a vital role in securing the long-term food supply. Quantified, the benefits consist in 31 percent less GHG emissions from agriculture, 71 percent less use of synthetic fertilizers and pesticides, and almost halved water consumption for irrigation. The spend on food would be 19 percent lowered per capita.

### Cash-out cost apparently lower

Investigating the benefits of a circular economy development path in the construction sector, the review balances a reduced consumption of virgin, non-renewable materials by 25 percent in 2030 and 38 percent in 2050 compared with the current scenario. This could be possible by relying more on renewable material and the recycling of construction and demolition waste, rather than bricks, steel,

and concrete made from virgin, non-renewable input. Applying circular economy principles in the mobility sector would similarly cut energy consumption in transport – 33 percent in 2030 and 66 percent in 2050 – and reduce the use of virgin materials in vehicle production. Energy consumption would likewise be lowered 24 percent lower in 2030 and 41 percent lower in 2050.

As mentioned before, the cash-out cost in the three focus areas would be rupee 14 lakh crore (218 billion US-Dollar, 11 percent of India's GDP) lower in 2030 and rupee 40 lakh crore (624 billion US-Dollar, 30 percent of India's GDP) lower in 2050, compared with the current scenario. This would decrease the cost for households: The expenditure per capita to meet the same level of mobility would be lowered 24 percent in 2030 and 50 percent in 2050.

In summary, the study shows that the circular economy offers attractive opportunities for both businesses and financial institutions: "Companies could moreover scale back investments in linear business models to avoid risks of exposure to greater market volatility and stranded assets", although the value of investment requires detailed analysis. As recently reported, an investment of 320 billion Euro in a circular economy in Europe would be necessary, but achievable with modest policy and industry action. "The opportunities for India outlined in this report require similar analysis to determine the right investments to make and the political and industrial action required to benefit from them", the review reasons.

The full report Ellen MacArthur Foundation, Circular Economy in India: Rethinking growth for long-term prosperity, 2016, can be downloaded under ➔ [www.ellenmacarthur-foundation.org/publications](http://www.ellenmacarthur-foundation.org/publications).

## British Company is Looking for Investors

MacRebur Limited is a company that holds the United Kingdom and European patent on the method and recipe of mixing waste plastics with bitumen, and a "magic formula", to produce a new asphalt road material. Its first creation is called Plasmac. According to the company's homepage,

compared to current British standard asphalt (sometimes called tar) the material produces a 60 percent stronger road. It reduces also potholes and rutting. As reported by the media, MacRebur's product – MR6 – has already been used on roads in North West England. Interest has been ex-

pressed from United Kingdom, Africa, Australia, Europe and South America. Now the company is looking to raise money (590,000 British Pounds) on a crowd funding platform; it intends to market the idea internationally.

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

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

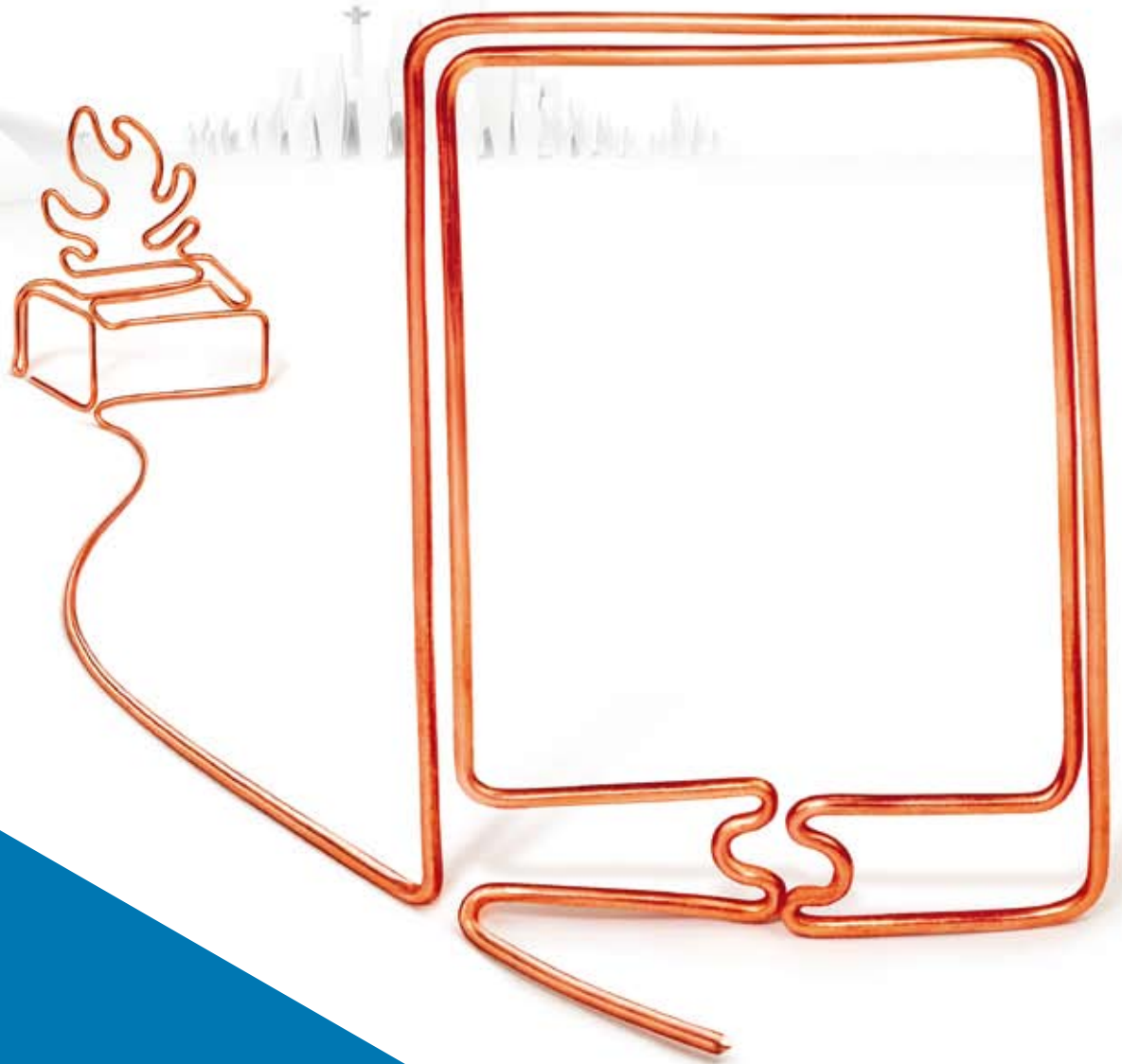


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## Spanish Company Expands Its Biomass Power Plants

The Spanish firm Ence – Energía y Celulosa intends to purchase the stake of Endesa – a leading operator in the Spanish electricity sector – in the renewable energy generation plants with biomass of Enemasa (Ciudad Real) and La Loma (Jaén), in which the company held 68.4 percent and 64.1 percent, respectively. According to the information, the operation allows Ence to increase the installed power

of its energy business by 29 percent, which now reaches 143 MW.

The plants, which mainly use olive stones (biomass derived from the treatment of the olive for oil extraction) have a total capacity for 32 MW and will reach an estimated net production of 175 million kWh in 2016, Ence announced in December last year. The company's goal is to achieve 383 MW

of installed capacity in biomass generation by 2020. By its own assessment, Ence is one of the main European producers of eucalyptus pulp (production capacity: more than 950,000 tons per year), an important Spanish company in the production of renewable energy using forest biomass and a leader in Spain for the comprehensive and responsible management of forest areas and resources.

## China-based Steel Producer Invests in Nigeria

According to media reports, Chinese HongXing Steel Company Limited has invested 100 million Dollar to establish two manufacturing plants, located in Aba, Abia State capital (Nigeria). It was intended that the projects are completed by the end of the first quar-

ter of 2017. End of December last year, the project had achieved 70 percent completion, several media informed. "The Aba projects have plant A, which will be using local raw materials from scraps, while plant B will be using billets and will be producing according

to international standards. When operational, the plants have great prospects not only for the company but also for Nigerian economy," Feng Zhen Ke, Managing Director of HongXing Steel Company Limited, was quoted by Nigerian Vanguard news.

## Malaysian Ministry Intends to Promote Recycled Products

The Malaysian Ministry of Science, Technology and Innovation (MOSTI) intends to promote locally-made recycled or green products for the local market. As reported, not many locals appreciate recycled materials produced by local companies.

"People often talk about pollution and plastic waste impact, but when we mention recycled products, they do not really value them and will

eventually turn to cheap, instead of quality products," Minister Datuk Seri Madius Tangau was quoted by the Malaysian National News Agency.

"Because of that, it's high time we assist these producers ... The ministry is looking into ways to promote these products (recycled) in the domestic market by making the public aware these are quality products." This he told at a press conference after visit-

ing the Heng Hiap Industries Sdn Bhd, a Malaysian plastics recycling company. The company exports about 1,500 tons plastic resins every month, especially to European countries. According to the information on the homepage, Heng Hiap Industries Sdn Bhd is developing recycling technologies. One recycling process includes transforming plastic scrap into "Smart Plastics" which can be used in highly specialized niche applications.

## Germany Offers Know How for Environmental Protection

In order to encourage projects of German companies and institutions and for the purpose of spreading environmental knowledge, environmental awareness as well as technical know-how in other countries, the German environmental department presented the "export initiative envi-

ronmental technology". Furthermore, this initiative plays an important part in encouraging the mediation and application of globally uniform environmental standards. According to the information supplied, product sale is not the chief aim. Therefore, the focus is rather on the accomplish-

ment of necessary framework conditions and structures for countries which need assistance. Past experiences have shown that there is need for international action especially regarding public services as for example water as well as wastewater supply.

## USA: Public Company Boosts Recycling

According to market research of Arizona-based Republic Services, Inc., nine out of ten Americans want recycling services, and they are willing to pay for it. For this reason, the

public company has grown its recycling capabilities in several markets across the USA. As reported by special interest media, Republic Services collects and processes roughly 5

million tons of recyclables per year at their 67 recycling centers nationwide – and invests millions of dollars in expanded recycling capabilities each year.



*More than 40 industry leaders have endorsed a new action plan to tackle global plastic issues, and have begun working together to create a more effective global system for plastics.*



Photo: Harald Heinitz / abfallbild.de

# Industry Backs Plan to Recycle 70 Percent of Plastic Packaging Waste Globally

The action plan is presented in “The New Plastics Economy: Catalysing Action”, a new study by the World Economic Forum and the Ellen MacArthur Foundation with analytical support from SystemIQ, which reveals that concerted action by industry could result in reuse and recycling of 70 percent of all global plastic packaging, up from today’s recycling rate of just 14 percent. Dominic Waughray, Head of Public-Private Partnership, Member of the Executive Committee, World Economic Forum, commented: “This could drive systemic change. The plan puts innovation at the heart of a strategy that could shift the entire system while unlocking a billion dollar business opportunity.”

The report provides a clear transition strategy for the global plastics industry to design better packaging, increase recycling rates, and introduce new models for making better use of packaging. It finds that 20 percent of plastic packaging could be profitably re-used, for example by replacing single-use plastic bags with re-usable alternatives, or by designing innovative packaging models based on product refills. A further 50 percent of plastic packaging

could be profitably recycled if improvements are made to packaging design and systems for managing it after use. Without fundamental redesign and innovation, the remaining 30 percent of plastic packaging (by weight) will never be recycled and will continue to destine the equivalent of 10 billion garbage bags per year to landfill or incineration. Innovation in packaging design, recyclable and compostable materials, and reprocessing technologies are likely all required to move this challenging segment forward.

## A strong initial momentum

The New Plastics Economy initiative brings together more than 40 leading organizations representing the entire global plastics industry, from chemical manufacturers to consumer goods producers, retailers, city authorities and recyclers, to work together towards a more effective global system. According to Dame Ellen MacArthur, founder of the Ellen MacArthur Foundation, the New Plastics Economy initiative has almost attracted widespread support: “Across the industry we are seeing strong initial momen-

tum and alignment on the direction to take." According to her opinion, the New Plastics Economy is a "catalysing action that provides a clear plan for redesigning the global plastics system, paving the way for concerted action".

The initiative will launch two global innovation challenges to kick-start the redesign of materials and packaging formats, and begin building a set of global common standards (a 'Global Plastics Protocol') for packaging design, concentrating initially on the most impactful changes. It will also improve recycling systems by delivering collaborative projects between participant companies and cities.

### Greenwashing or ambitious?

The "Deutsche Umwelthilfe" (German Environment Aid) criticizes the initiative as Greenwashing, serving to prevent effective laws for avoidance of plastic waste and to deviate from the specific destruction of a resource efficient multiple use system. According to DUH, the verbalized aims of environmental protection are all the same without obligation, lack a concrete time frame and show great disproportion to the real entrepreneurship.

On contrary, the European Plastics Converters (EuPC) Association, representing over 50.000 plastics converting companies in Europe, welcomes the initiative as very ambitious, defining an "effective after-use plastics economy" to reduce plastics leakage into the environment and decouple from fossil feedstocks. EuPC looks forward to closely collaborating both with the Ellen MacArthur Foundation and trade and consumer associations to foster an informed education on waste.

### Establishing a unique supply chain

However, almost one year ago a report from the Ellen MacArthur Foundation found that 95 percent of the value of plastic packaging material, worth 80 to 120 billion US-Dollar annually, is lost to the economy after the first use. Challenged by that issue, Procter & Gamble created the world's first recyclable shampoo bottle made from up to 25 percent beach plastic. The first 150,000 bottles will be available in France this summer by consumers at Carrefour, one of the world's leading retailers. Additionally, P&G announced that in Europe by end of 2018 more than half a billion bottles per year will include up to 25 percent post-consumer recycled plastic. The project will require a supply of 2,600 tons of recycled plastic every year.

According to P&G, this will be the world's largest production run of recyclable bottles made with post-consumer recycled beach plastic. And will be a first major step in establishing a unique supply chain that involves the support of thousands of volunteers and hundreds of NGOs collecting plastic waste found on beaches. Lisa Jennings, Vice President, Head & Shoulders and Global Hair Care Sustainability Leader at Procter & Gamble, is convinced: "We felt that the leading shampoo brand in sales should lead in sustainability innovation and know that when we do this, it encourages the entire industry to do the same."

The full report on "The New Plastics Economy: Catalysing action" is available under [www.ellenmacarthurfoundation.org/publications/new-plastics-economy-catalysing-action#purchase-options](https://www.ellenmacarthurfoundation.org/publications/new-plastics-economy-catalysing-action#purchase-options)

## Unilever Commits to Recyclable Plastic Packaging

**The international company invites collective action from fast-moving consumer goods industry to be fully circular on plastic packaging.**

In January, the Dutch-British concern Unilever has committed to ensure that all of its plastic packaging is fully reusable, recyclable or compostable by 2025. As part of this, it will publish the full range of plastics materials used in its packaging by 2020 to help create a plastics protocol for the industry. In addition, it wants to "invest

in proving, and then sharing with the industry, a technical solution to recycle multi-layered sachets, particularly for coastal areas which are most at risk of plastics leaking into the ocean". As reported, the concern has already committed to reduce the weight of the packaging as it uses this decade by one third by 2020, and increase its

use of recycled plastic content in its packaging to at least 25 percent by 2025 against a 2015 baseline, both as part of the Unilever Sustainable Living Plan. "In 2015, it achieved its commitment of sending zero non-hazardous waste to landfill across its manufacturing operations," the corporation underlined.

## China to Recycle 350 Million Tons of Waste by 2020

According to the State Council of the People's Republic, China is expected to recycle 350 million tons of waste resources including steel, nonferrous metals, plastic and paper annually by 2020, according to an official guideline. By 2020, the country plans to develop a sophisticated system for renewable resources: It intends to use 150 million tons of waste steel and 18 million tons of waste nonferrous metals annually.

The country also aims to recycle 23 million tons of waste plastic and half of all its waste paper by 2020 annually, according to a plan included in the guideline. The guideline was jointly released by ministries of industry and information technology, commerce, and science and technology.



# Sustainability is Increasingly Core to Business Strategy

**State of Green Business 2017: New assessment of the progress by companies around the world in addressing their energy, waste, water, greenhouse gas and other impacts.**

According to British company Trucost, enterprises and investors increasingly understand the fundamental importance of sustainable business and are taking action to reduce their environmental impacts. This is the message of the report "State of Green Business 2017," published in partnership with Trucost (a company, which helps organizations measure and manage the environmental impacts associated with their own operations) by US-based business-to-business media company GreenBiz Group. As reported, it is the 10th annual assessment of the progress by companies around the world in addressing their energy, waste, water, greenhouse gas and other impacts, and in increasing their sustainability investments, transparency and other leadership activities. The report assesses the sustainability performance of U.S. companies in the S&P 500 index as well as those in the S&P Global 1200.

"In an increasingly complex business environment of growing resource use and climate concern, along with the uncertainties brought about by the 2016 U.S. elections, sustainable business faces a challenging future," GreenBiz Group Chairman and Executive Editor Joel Makower, the report's lead author, was quoted. "However,

we're seeing that the world's largest companies remain steadfast in their sustainability commitments and achievements."

Among the signs of progress:

- The price tag associated with natural capital impacts caused by companies — from resource extraction and emissions into the air, water and soil — was down over 15 percent since its peak in 2013, continuing a trend observed in the 2016 report.
- Total assets invested in the United States that consider environmental issues have grown 77-fold since 2010 and now exceed 7.79 trillion US-Dollar. The total value of green bonds, offered to raise funds to support projects that have positive environmental benefits, has grown 79-fold since 2012 and was valued at 38.4 billion US-Dollar in 2016.
- Nearly 60 percent of global stock exchanges have implemented – or are in the process of developing – environmental requirements for companies wanting to list with them impacting more than 50,000 companies listed on those exchanges.

On the negative side, the use of wind, solar and hydro by utility companies has stagnated and even regressed

slightly since 2011. Meanwhile, companies' current greenhouse gas-reduction projects account for less than 7.5 percent of what is needed to be achieved every year between now and 2050 in order to meet the climate goals set forth in the Paris Agreement.

According to Richard Mattison, CEO of Trucost, a division of S&P Dow Jones Indices, "nearly half of the world's 1,200 largest companies would be unprofitable if they had to pay their fair share of the 3.4 trillion US-Dollar in environmental and social costs of their resource consumption and pollution in 2015."

The report also names 10 sustainable business trends for 2017, including the growing role of block chain in company sustainability efforts, the growth of advanced materials that support companies' circular economy ambitions, the notion that water can become an unlimited resource in a circular economy, and companies' increased investments in improving their supply-chain partners' environmental and social performance.

The free report can be downloaded at [www.trucost.com/publication/the-state-of-green-business-2017/](http://www.trucost.com/publication/the-state-of-green-business-2017/)

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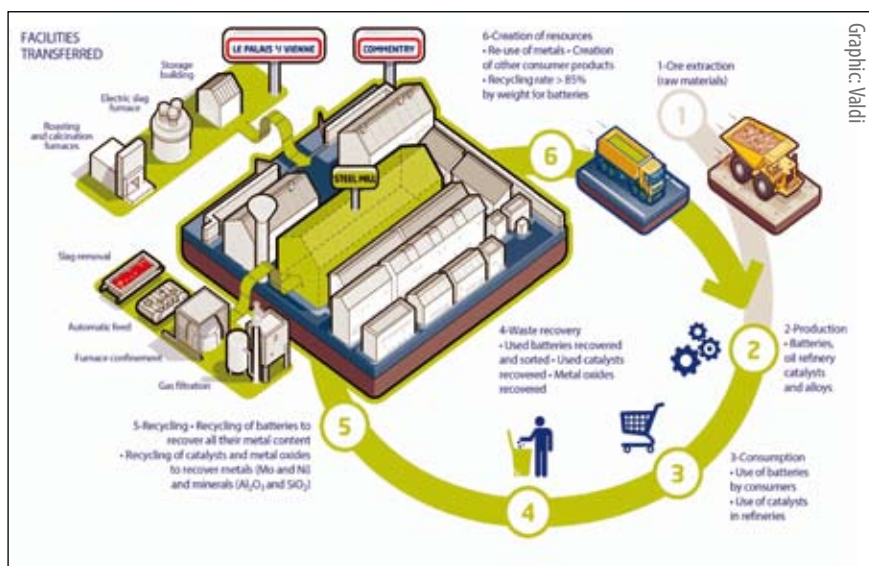
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## Valdi Has Finished First Battery Recycling Run

From the end of 2017, Valdi (a subsidiary of Eramet Group) will offer Europe's biggest processing capacity based on pyrometallurgy: It will have an annual processing capacity of 20,000 tons of batteries, 10,000 tons of spent oil catalysts and 8,000 tons of metal oxides.

According to the company, pyrometallurgy is "the only technology that guarantees that 100 percent of metals in spent batteries are recovered, with zero landfilling". In February this year, 200 tons of batteries were treated to finalize the process. According to the information, this first wave of battery recycling is perfectly in line with the project's orientations. The next run, planned for the second half of March, would enable the plant to ramp up processed volumes, with a high-speed steel run, the site's other production, also on the schedule.

Located in Commentry, Allier (France), Valdi is – according to Eramet – a unique industrial setup. The metals contained in batteries, oil catalysts and metal oxides can all be recycled on a single site. This specificity, combined with waste valorization, makes Valdi a solution provider and a major participant in France's competitive-



ness in sustainable development, the company is convinced.

In a brownfield industrial site, Valdi is helping to build a French and European channel for recycling batteries under the circular economy

principle, maintain industrial jobs in central France and meet major European challenges. Since early 2016, the European obligation to collect spent batteries increased from 25 percent to 45 percent, with the corresponding need for processing capacity.

## Two Specialists Partner to Commercialize a Technology for Iron Ore Fines Recovery

In December last year, Tenova HYL and Diproinduca Canada Ltd. have entered into a commercial alliance agreement. Tenova is a part of the Techint Group and a worldwide partner for solutions in metals and mining, while Diproinduca acts as an international company with experience in processing, recycling, briquetting and commercializing by-products in the iron and steel industry.

Their goal is to develop and commercialize the DRB (Direct Reduced Briquettes) technology oriented to recovery and recycling of iron ore fines in Direct Reduction (DR) plants. Iron ore low value by-products in DR plants include the fines from scrubbing systems of material handling, iron ore screening and the sludge mainly produced in the scrubbing systems of the reduction and cooling gas circuits of DR installations. These particles are currently disposed of at a cost or are sold at low-priced by-products. "The DRB technology is intended to recover and recycle these fines, which have the cost of the iron

ore on site, by producing briquettes that can be fed directly into the DR reducing reactor to produce DRI," the companies explain. "In this way, the overall yield is significantly increased, the operating costs are reduced and the disposal logistics costs of the DR plants are eliminated."

As reported, the technology is based on the production of briquettes made from the recovered iron ore fines from various sources, suitable for production of DRI with the same quality of the DRI actually being produced in the DR plant. It has been developed and tested in industrial plants. According

to the information, tests results "have shown an average metallization of 94 to 95 percent with carbon content of about 3 percent and low fines generation, all at the same level of the DRI actually produced from iron ore pellets, reflecting the excellent behavior of the briquettes in terms of porosity and mechanical strength during the reduction process inside the industrial reactor".

Currently, a demonstration plant has been installed in Monterrey, Mexico, with the purpose of recycling fines from screening and sludge at the DR plant at Ternium facilities.



## Positive Verdict from Global Tire Producer

Swedish-based company Scandinavian Enviro Systems AB has received a positive response from an international tire manufacturer which has carried out extensive quality tests on Enviro's recycled carbon black, EnviroCB.

As reported, the test result confirms that Enviro's material performs on parity with virgin carbon black in terms of the characteristics of rubber intended for certain types of tires. It also gives the green light for moving forward according to plan with testing recycled carbon black as a component in newly produced tires. "The tire producer has high quality demands since tires are safety products," Enviro stated. "They are working with a long-term perspective to increase the share of recycled material in their tires, both from an environmental perspective and in a future scenario where there may be a shortage of raw materials."

According to Enviro, the company's objective is to establish recycling fa-



Thomas Sörensson

cilities for end-of-life tires on a global market. The more commercial outlets there are for recycled carbon black,

the larger this market will be, the management is convinced. Enviro has presented the recycled carbon black, with a commercially verified quality level, to a number of the largest tire manufacturers in the world, and several of them are currently carrying out rigorous testing.

"The deal with AnVa Polytech, which delivers components containing recycled carbon black to Volvo Cars, has been an important step on the path to future deals. Each application approved by the industry means increased opportunities for Enviro's plant sales", said Thomas Sörensson, CEO of Enviro.

➔ [www.envirosystems.se](http://www.envirosystems.se)

Photo: Scandinavian Enviro Systems AB

## First European List of Safe and Environmentally Sound Ship Recycling Facilities Published

The European Commission has adopted the first version of the "European List of ship recycling facilities". This can be seen as an important step to help ensure that ships are recycled in facilities that are safe for workers and environmentally sound.

From a date to fall at the latest on 31 December 2018, the 2013 EU Ship Recycling Regulation requires all large sea-going vessels sailing under an EU Member State flag to use an approved ship recycling facility.

The first 18 shipyards are all located in the EU. They fulfill the strict requirements for inclusion in the List and as a result will have access to the recycling of ships flying the flags of the EU Member States. Applications from yards in third countries are still being assessed. The Commission will decide in 2017 on their inclusion in the List.

Karmenu Vella, Commissioner for Environment, Maritime Affairs and Fisheries, commented: "I congratulate the 18 European companies which have made it on the European List of ship recycling facilities. The List sends a clear signal that there is business and employment in safe and environmen-


tally sound ship recycling, starting in Europe. With the List we close the loop for the European naval industry: These ships were often designed and built in Europe; we can take care of them at the end of their life too – in a respectful way."

Together with the first version of the European List, the Commission has adopted four further acts to provide information on hazardous materials in ships and facilitate the recycling process. The Regulation obliges all ships visiting European ports – irrespective of the flag they fly – to carry on board an Inventory of Hazardous Materials from the end of 2020 onwards. The measure is expected to improve sourcing of quality ship parts globally and benefit European shipbuilding yards. Already from the publication of the List, all EU flag ships going for dismantling must carry on board an Inventory of Hazardous Materials.

The European List is available under ➔ <http://ec.europa.eu/environment/waste/ships/list.htm>.

Photo: pixabay





# European Union: On the Road to the Circular Economy

On 24 January this year, the European Parliament's environment committee voted on the pending legislative proposals on the 2015 Waste Package put forward by the European Commission.

According to the opinion of the committee members, the share of municipal waste to be recycled should be raised to 70 percent by 2030 or prepared for reuse. For packaging materials, such as paper and cardboard, plastics, glass, metal and wood, they propose an 80 percent target for 2030, with interim 2025 targets for each material. Landfilling, which has a big environmental impact, should be limited to 5 percent, albeit with a possible five-year extension, under certain conditions, for member states which landfilled more than 65 percent of their municipal waste in 2013. Food waste in the EU is estimated at some 89 million tons, or 180 kilogram per capita per year – therefore the committee members advocate an EU food waste reduction target of 50 percent by 2030, compared to 2014. They also propose a similar target for marine litter.

According to the information, statistics from 2014 suggest that 44 percent of all municipal waste in the European Union is recycled or composted. "This compares to just 31 percent in 2004, and by 2020 EU member states should be recycling or composting over 50 percent of waste," the Parliament stated in its press release. In 2014, Austria, Belgium, Denmark, Germany, the Netherlands and Sweden sent virtually no municipal waste to landfill, whereas Cyprus, Croatia, Greece, Latvia and Malta still landfill more than three quarters of their municipal waste.

The majority view in Europe is that improving waste management could deliver benefits for the environment, climate, human health and the economy. As part of a shift in EU policy towards a circular economy, the European Commission made four legislative proposals introducing new waste-management targets regarding reuse, recycling and landfilling in 2015, after it had decided to ditch the Circular Economy package, launched by its predecessor. As campaigners and progressive businesses had complained, despite the announcement the new proposals would be more ambitious than the previous ones, the targets for recycling and reducing landfill waste were weaker. According to the critics, the 2015 Circular Economy Package also fails to adequately address waste prevention by repair and reuse, and lacks a legal framework that incentivizes prevention.

## Waste production and recycling

In 2014, the total waste generated in the 28 member states of the European Union (EU-28) by all economic activities and households amounted to 2.598 billion tons. As reported by Eurostat (a Directorate-General of the European Commission; its main responsibilities are to provide statistical information to the institutions of the European Union), there were considerable variations across these

## A Welcome Change

On March 14th, 2017 the European Parliament has opted to follow the ambitious lead set by Environment committee's vote on the Circular Economy package in January this year.

According to the Confederation of European Paper Industries' (CEPI) opinion, the Parliament had "fully grasped the opportunity to make the Circular Economy work for Europe by enabling industry and local authorities to better target where investment needs to take place," CEPI Director General Sylvain Lhôte was quoted. The association would recognize that the new recycling targets are ambitious while providing new opportunities in terms of improving quality.

"For an industry where over half of our feedstock comes from paper for recycling, the Parliament's approach means greater use of raw materials whilst putting the emphasis on quality," CEPI Raw Materials Director Ulrich Leberle commented. According to CEPI, the vote to encourage the use of bio-based packaging also demonstrates the importance of a Circular Economy that builds upon Europe's wealth of renewable resources while accelerating the transition towards a low-carbon economy. Finally the continued assertion of the separate collection of paper is viewed by the European paper and board industry as a means to bridge ambitious targets with higher quality recycling.

countries, both in the amount of waste generated and in the activities that mostly contributed to waste generation. According to latest available statistics, the average amount of waste generated across the EU-28 in 2014 was equivalent to more than five tons (5,118 kilogram) per inhabitant. On January 1, 2016 the population of the EU-28 was estimated at 510.1 million inhabitants, which were 1.8 million more than a year before, Eurostat said in its report "Key figures on Europe – 2016 edition".

Almost two thirds (65 percent) of the total waste generated in the EU-28 was mineral waste. Construction contributed 33.5 percent of the total in 2014 (with 871 million tons) and was followed by mining and quarrying (29.8 percent or 774 million tons), manufacturing (9.8 percent or 256 million tons), households (8.1 percent or 209 million tons) and energy (3.7 percent or 95 million tons); the remaining 15 percent was waste generated from other economic activities, mainly including waste and water services (8.8 percent) and services (3.8 percent). Among the total of 2.598 billion tons of waste some 95.6 million tons (3.7 percent of the total) were classified as hazardous waste (equivalent to an average of 188 kilogram per inhabitant in EU-28).

In 2014, some 2.145 billion tons of waste were treated in the 28 European countries. "This includes the treatment of

waste imported into the EU and the reported amounts are therefore not directly comparable with those on waste generation," the European statistical authority reported. Over two fifths (43.6 percent) was subject to disposal operations other than waste incineration. A further 39.0 percent of the waste was sent to recovery operations. More than one tenth (10.8 percent) of the waste was backfilled, where backfilling is the use of waste in excavated areas for the purpose of slope reclamation or safety or for engineering purposes in landscaping. The remaining 6.5 percent was sent for incineration, either with energy recovery or without.

Significant differences could be observed among the EU member states concerning the use they made of the various treatment methods. The quantity of waste landfilled in 2014 was 16 percent lower than it had been in 2004. The quantity of waste recovered (excluding energy recovery) - in other words recycled or used for backfilling - grew by 20.1 percent from 890 million tons in 2004 to 1.069 billion tons in 2014. According to Eurostat, the share of such recovery in total waste treatment rose from 42.1 percent in 2004 to 49.9 percent by 2014. Waste incineration (including energy recovery) saw an overall increase between 2004 and 2014 of 29.6 percent and its share of the total rose to 6.5 percent. In total, the EU member states had to deal with 75.6 million tons of hazardous waste. 37.5 per-

## Study: Top Performers in Separate Collection

Last year, the European Commission presented a study assessing the current separate collection schemes in EU-28 with examples of best practices. The result: Separate collection is a legal obligation in Europe, but improvements are needed to help speed the transition to a more circular economy. The cities topping the list were Ljubljana (Slovenia), Tallinn (Estonia) and Helsinki (Finland) with collection rates as percentage of total municipal waste generation of 55.4 percent, 47.2 percent and 38.6 percent respectively.

"Good waste management is a vital element in setting the economy on a path of sustainability, together with sustainable product policy," the European Commission stated. "Separate waste collection plays a key role in this transition, as it increases recycling rates, minimizes the amount of waste that is sent for disposal, and moves Europe closer to zero waste. By doing this, it can also cut CO<sub>2</sub> emissions and save virgin resources."



cent of this amount was recovered (recycled or used for backfilling) in 2014.

### Circular economy and social benefits

A circular model, where products are designed for reuse, recycling, maintenance and repair, upgrading and remanufacturing, is a concept which is gaining ground in Europe. "Many studies have already shown the business case for a circular economy," the Club of Rome stated on its homepage. "But how would a circular economy benefit society more broadly?" On that account the international think tank had begun a project which looks at the impact of a circular economy on jobs, carbon emissions and the trade balance in different European economies. "Using an input/output model and data from the World Input Output Database, the project concluded that an economy based on circular resource flows would create jobs, reduce carbon emissions and improve the trade balance," the Club of Rome underlined.

Up to now two studies were published (➔ [www.clubofrome.org/project/circulareconomy/](http://www.clubofrome.org/project/circulareconomy/)). The results of the first – a report exploring Finland, Sweden, France, the Netherlands and Spain – were presented in Brussels in October 2015 as an input for the European Commission's package on the Circular Economy (December 2015). After requests from Poland and the Czech Republic a special study was done on their economies. The second report was launched in Poznan in October 2016.

In this recent study the authors Anders Wijkman and Kristian Skånberg assessed first and foremost what the likely effects would be on carbon emissions and job opportunities in the Czech Republic and Poland of the following key steps in a circular economy: Enhancing energy efficiency, increasing the percentage of renewable energy in the energy mix – and re-organizing society to enhance the overall resource-efficiency along the lines of a materially-efficient, circular and performance-based economy by:

- minimizing waste and by introducing a 25 percent overall increase in material efficiency,
- maximizing the reuse and recycling of materials by letting 50 percent of all virgin materials being replaced by secondary materials, and

- extending wealth by doubling the product life of long-lived consumer products compared to today.

"If all the different decoupling strategies would be pursued together the results would be substantial," the authors emphasized. "As the different decoupling scenarios support and enforce each other in virtuous circles – improved resource efficiency having energy efficiency effects, and energy efficiency making it much easier to increase the share of renewable energy and cut the use of fossil fuels – the combined scenario would in reality be the easiest one to achieve." In this case, carbon emissions would likely to be cut by more than two-thirds in the Czech Republic and Poland. The number of additional jobs would – according to the information – exceed 150,000 in the Czech Republic while the number would depend on the development of the agricultural sector in Poland. "This means that unemployment in the Czech Republic could be cut by more than half (August 2016), especially if some of the likely trade surplus gains would be used for domestic investments to boost resource efficiency in general, preferably along the lines of the investment-packages presented later on in the report. Also in Poland the unemployment rate could be reduced by moving towards a more circular economy, provided that Poland gives priority to the development of a bio-based economy, where both agriculture and forestry would play a key role." There are also economic benefits. As reported, the improvement in the trade balance could amount to more than 2 percent of GDP (Gross Domestic Product) in both the Czech Republic and Poland. In this regard, the authors stated that there would be no trade balance gains globally. "Some countries, especially non-industrialized fuel and virgin material exporters, tend to lose when the circular economy as a concept gains broader acceptance. Over time – once economies around the world would become more resource-efficient, the benefits for early mover countries would be reduced." But by not acting at all, the Czech Republic and Poland would probably be on the losing end when other countries would start moving towards greatly enhanced resource efficiency, the study says.

According to Anders Wijkman and Kristian Skånberg, the investments required – in addition to the normal level of investments – for moving towards a circular economy have

## Business Opportunities through eTendering

According to the European Union, eTendering is an eProcurement platform based on EC directives where Contracting Authorities and Economic Operators can perform their daily eProcurement activities. "Allowing access to a Call for Tenders related documentation such as contractual documentation, technical specifications, annexes, questions and answers, the eTendering represents a very effective extension to TED (Tenders Electronic Daily), the online version of the 'Supplement to the Official Journal of the European Union'. The business transaction is processed under a secure environment and in an efficient way. eTendering is the most cost effective way to perform tendering – all the proposed services are free of charge."

Interested persons can find EU tenders for the waste sector under the CPV code "Environment and Sanitation".

- ➔ <https://etendering.ted.europa.eu/general/page.html?name=home>
- ➔ <http://ted.europa.eu/TED/main/HomePage.do>

been calculated to be in the range of 3 percent of GDP per annum – currently around five billion Euro in Czech and ten billion Euro in Poland – every year from now on until 2030. These investments would decrease unemployment with another 2 to 3 percent in the Czech Republic and Poland due to the increased domestic production the investments would lead to. “As more or less half of the total production value incurred by such investments would

take place abroad, i.e. foreign firms exporting components to the investment projects, unemployment would come down in other countries as well,” the authors of the study underlined. This would mean that for every EU member state deciding to embark on an investment package like the one described, “there will be positive employment effects in the EU as a whole. This is a natural consequence in an open-market trading-zone like the EU.”

## New Research Report on Waste Recycling Services Market

The market research company Future Market Insights has announced the addition to the report “Waste Recycling Services Market: Global Industry Analysis and Opportunity Assessment 2014 – 2020” to their offering.

Recycling is the next trend, the provider of the report acknowledges. “The growth of the waste recycling services is driven by the technology development for waste recycling, the government initiatives towards recycling of waste product and push for reuse of wastage materials,” Future Market Insights states. “Increasing awareness towards benefit of recycling among people and growing numbers of recycling manufacturers are other factors which will uptake the growth of the recycling industry in the near future.”

The waste recycling services industry faces a different set of challenges that include increasing demand and restricted supply, increasing use of natural resources to produce recycled products, and high cost involvement for producing recycled product. However, due to unsuitable government policies for both manufactur-



Photo: Marc Weigert

ing and reprocessing, environmental, health and safety concerns have been caused. A growing demand from regional market and economical labor costs are expected to drive the demand for global waste recycling services market in the near future.

According to market research, the automotive segment has dominated the recycling services market and held over 50 percent of the market share in 2014. According to the informa-

tion, the tire and rubber segment is expected to witness 4.3 percent CAGR (compound annual growth rate) in the near future. However, iron and steel is another sub-segment of metal which is estimated to account for 53.3 percent of total revenue market in the near future. This is a tribute to the substantial decline in the metal price.

➔ [www.futuremarketinsights.com/reports/sample/rep-gb-255](http://www.futuremarketinsights.com/reports/sample/rep-gb-255)

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# Aim: A Market-Driven Circular Economy in Europe

The European recycling industries have evolved by modernizing and constantly innovating to turn more waste streams into new resources.

By doing so, the sector has contributed to the development of new technologies and automated equipment made in Europe and exported around the globe. "The European regulatory framework has accompanied these changes thanks to ambitious targets and a meaningful waste hierarchy," the European Recycling Industries' Confederation (EuRIC) says on its homepage. The association also advocates positive measures to ensure a consistent implementation of existing legislation across Europe.

However, there remains a need and potential of further improvements to reach the goal of a genuine circular economy: According to EuRIC, the recycling sector continues to be subject to a complex and ever-growing EU regulatory framework, which affects its activities. To ensure a competitive European recycling sector, which is part of a global industry, the European confederation advocates clear, effective and smart European policies which:

- incentivize recycling across the value chains;
- minimize regulatory burdens on recyclers, in particular on small and medium-sized enterprises (SMEs);
- guarantee an open and fair competition within Europe and with the world to foster a recycling market.

"Global Recycling" has asked Michael Schuy, President of the European Recycling Industries' Confederation (EuRIC), how the vision of a market-driven circular economy in Europe could become reality.

*Mr. Schuy, the Members of the European Parliament's Environment Committee voted on 24 January this year for increasing the draft EU recycling*

*and landfill targets that had been lowered by the EU Commission in its postponed Circular Economy Package. Do you think a recycling target for municipal waste in the amount of 70 percent as well as a waste landfill target restricted to 5 percent is achievable by 2030?*

Recycling targets alongside with the waste hierarchy set at European level have played an important role in steering investments in recycling for years. Nevertheless, far too much emphasis is granted to the 5 percent increase of the target for municipal waste voted by the Environment (ENVI) Committee of the European Parliament. Firstly, because, as proposal acknowledged itself, municipal waste constitutes approximately between 7 and 10 percent of the total waste generated in the Union. Secondly, because as a practical person, given today's baseline, it would already be a much welcome achievement if the 65 percent target proposed by the European Commission was attained by 2030 throughout Europe. And last but not least, as a recycler, I am well-placed to know that any waste with a positive value is already recycled to a large extent and recyclers are champions in valuing into new resources what others see as a waste. So, as I will explain, current problems will not solely be solved by increasing recycling targets.

Regarding landfill we can go a step further. Naturally, lowering the target for landfilling is positive but a progressive landfill ban for all recyclable materials would have been more efficient.

*There is hope that the Circular Economy Package will pave the way for more than 800,000 jobs created across Europe by 2030. In which sectors*



*would this happen, if the European Parliament and the Council of Ministers agree on the Package with higher targets?*

The Circular Economy Package often comes with fabulous estimates on job creation. They usually stem from the significant job potential in recycling which, to turn waste into quality new raw materials, provides local, non-outsourcable jobs and a genuine network for waste collection and treatment throughout Europe. Nevertheless, for these job estimates to become true, certain framework conditions – not only targets – need to be fulfilled. In the current package, many of these conditions are not fulfilled. In particular, recycling companies are facing significant administrative burdens directly linked to European legislation which hampers their day-to-day operations and an increased competition from public-owned entities which benefit from special rights including fiscal advantages and monopolies over collection.

For instance, in certain regions, bulky household appliances must be collected by municipalities, although hundreds of scrap yards in Europe, which constitute an unmatched infrastructure, are much better equipped and often closer to the consumer. For decades, they did a great job in collecting scrap from households – free of charges for the society – and often are no longer permitted to do so. In addition, the benefits of recycling in terms of CO<sub>2</sub> and energy savings, despite being well-documented, are still not reflected in prices. As a result, currently, recycling cannot realize its full potential in Europe as a number of recycling businesses, many of them SMEs, see their growth and job creation potential hindered by these obstacles. This is why EuRIC calls for practical actions and measures to address each of them.

**Mr. Schuy, EuRIC advocates for a market-driven circular economy in the European Union. Is it possible to enforce such a way of economics considering the different interests in Europe?**

Yes, because it is precisely what Europe did years ago with the free movements of goods by removing obstacles to trade, ensuring a level playing field and fair competition allowing operators to make business. Applied to recycling, this means making sure that legislation, alike recyclers, sees waste as a resource and not anymore as a risk. In practical terms, there is a thorough simplification exercise to be made. First, simplify the rules defining what a waste is and what it is not, as well as the rules linked to waste clas-

sification. Some draft laws currently discussed which align the waste legislation with the chemical one could result in re-classifying certain waste streams as hazardous with huge impacts on their recyclability. Second, simplify and harmonize the rules linked to waste shipment procedures which is instrumental for the realization of an internal market for recycling. Third, put in place true price signals at European level; to increase the costs of landfilling and incineration of recyclables and to internalize in prices through market-based mechanisms the environmental benefits of recycled materials incentivize their use. If we take the example of steel scrap, it is well-known that using recycled steel scrap can save up to 64 percent of CO<sub>2</sub> emissions when comparing with primary production. However, nothing today rewards this environmental benefit.

Last but not least, EuRIC will continue to fiercely advocate for free and fair international trade, simply because the circular economy cannot stop at Europe's borders and because closing markets is not good for any business activity. Taking again the example of steel scrap, there is annually on average 10 million tons more scrap than the EU demand from steel mills. If it was not exported to make new steel, the solutions left would be to stockpile or landfill which would make little sense from an environmental and economic viewpoint.

**How could a way of doing business that is determined by the conditions of the market look like? What does push and pull measures mean in practice regarding the supply and demand of recycling products?**

No need to re-invent the wheel. "Push" measures aim at fostering the offer of raw materials from recycling and "pull" measures are to incentivize the demand of recycled materials. Regarding the former, the European Union has over the last decades played a crucial role in laying down push measures through for example recycling targets or the waste hierarchy or landfill restrictions.

The key word for push measures is better enforcement. Regarding the latter, we are lagging behind as too little has been done to pull the demand for recycled materi-



Michael Schuy

Photo: EuRIC

## About EuRIC



The European Recycling Industries' Confederation, founded in 2014, is the umbrella organization for European Recycling Industries and represents nearly 6,000 private companies which provide about 300,000 jobs and recycle approximately 150 million tons of a variety of waste streams. Owing to its network of member associations, EuRIC acts as interface between the industry and the European Union and serves "as a platform for information, cooperation and exchange of best practices on all European recycling matters".

According to the information, EuRIC and its members support a value chain approach and strive "to nurture constructive relationships at all levels with stakeholders benefiting from recycling activities, including public authorities, manufacturers, producer responsibility schemes, academia and NGOs".

➔ [www.euric-aisbl.eu](http://www.euric-aisbl.eu)

als. This is why EuRIC calls, at EU level, for market-based incentives rewarding recycled materials environmental benefits, targets on recycled content for certain resource streams, eco-design requirements on resource efficiency and green public procurement. The European Union sets up measures to incentivize the shift towards renewable energies. The same should be done for recycling.

*Would “green” procurement, fiscal easements for recycled materials and other rewards (e.g. for an increased amount of recycling) be enough in order to give market dynamics a boost?*

Clearly, they would make a difference as the economic crisis and its aftermath told us. When raw materials prices are low, recyclers for example of plastics can sometimes hardly compete on price with virgin materials, which have a very different cost structure and environmental impacts than recycled materials. Hence, there is a need for market mechanisms to correct these externalities and ensure that the benefits of using recycled materials is correctly reflected in prices. As public authorities should lead by example, making sure the way they procure goods and services matching the objectives of the circular economy is obviously important especially since “public authorities in the EU spend around 14 percent of GDP on the purchase of services, works and supplies”<sup>(1)</sup> One should not forget the importance of eco-design. The European Commission is taking the lead by proposing criteria to ease re-use and recycling when products reach end of life stage. EuRIC naturally strongly supports it simply because “more than

80 percent of the environmental impact of a product is determined at the design stage”<sup>(2)</sup>

*Are additional measures of the European Member states necessary to unlock a market driven circular economy? Which ones would they be?*

Sweden for example has just enacted a reduced VAT rate for repair activities. This is a positive step forward which would benefit from being extended to recycled materials at European level.

*According to your opinion, when would it be possible to achieve the goal that competition and internal market rules become integral parts of this way of doing business?*

As soon as policy-makers will truly see waste as a resource and not mainly as a risk to manage, this will open the door to the application of the same recipe to waste and recycling markets as the one applied to the internal market, which put free movement and fair competition at the heart of its completion. This is a matter of perception and there is still room for improvement.

*Mr. Schuy, thank you very much for this interview.*

(1) Public procurement introductory webpage ➔ [https://ec.europa.eu/growth/single-market/public-procurement\\_en](https://ec.europa.eu/growth/single-market/public-procurement_en)

(2) Ecodesign your future – How ecodesign can help the environment by making products smarter, European Commission, 2012 ➔ <http://bookshop.europa.eu/en/ecodesign-your-future-pbNB3109210/>

## BIR Delegation Met with World Bank’s Trade Advisors

**The five countries of the East African Community (EAC) – Uganda, Kenya, Tanzania, Rwanda and Burundi – intend to phase out imports of used textiles and footwear by 2019.**

On that account, representatives of the Bureau of International Recycling (BIR) – BIR President Ranjit Baxi and Textiles Division President Mehdi Zerroug – took the initiative and visited Nairobi for a high-level meeting with trade advisors of the World Bank,

whose work in Kenya aims to accelerate sustainable growth, reduce inequality, and manage resource scarcity.

The meeting “gave BIR representatives the opportunity to explain in detail the benefits of importing primary sorted mixed clothing and to stress the importance of also building the secondary sorting and ancillary industries (production of wipers and other usable products from non-wearable textiles),” the Bureau of International Recycling gave account. As reported, the federation recommended that EAC should promote the import of mixed sorted clothing with a view to enhancing sustainable growth and increased employment and should continue to support those parts of the population that depend on the employment in the sector. To facilitate discussions, more research would

need to be undertaken to build evidence on the job creation and other economic, social and environmental opportunities that could be realized if the EAC were to lift its threat of a ban on used clothing imports and actively pursue a program to encourage the establishment of used clothing sorting and textile recycling businesses within these African countries. “In the interim, BIR will be seeking accurate information from national associations on their country’s exports to EAC member states and to provide an informed overview of the potential scale of sorting that could take place in all five EAC member states,” the federation underlined.

Further meetings are envisaged to be held between the World Bank and BIR, the aim being to present a detailed report to EAC governments for reconsideration of the import ban.

Photo: SOEX







# All Sails Set

**The Netherlands are Heading Towards a Circular Economy.**

**T**hirty years ago, the Netherlands suffered from a lack of landfill capacity and insufficient thermal treatment capacity. This urged a change in waste management policy: The amount of landfilled waste decreased from 35 percent in 1985 to 2.3 percent in 2010. The rate of recovery including waste-to-energy rose from 50 percent to 88 percent. Currently 79 percent of the Dutch waste is recycled; the residual waste is mainly used for energy production, according to Rijkswaterstaat at the Ministry of Infrastructure and the Environment.

This must be differentiated. The landfilling rate has decreased by introducing a landfill tax in 1995 and sharp tax increases in 2002 and 2010, that made it the highest in Europe. In 2012 landfilling reached such a low level that the government repealed the tax being administratively bothersome. For consistency, the amount of waste rose again and led to a new waste disposal tax in April 2014. Following the inter-trade organization Vereniging Afvalbedrijven, an alternative is sought-after that brings in 100 million Euro per year, is environmentally friendly and avoids unfair market competition. Meanwhile, 22 landfills are active; 75 percent of the remaining capacity for landfill is in public hands.

As the European Environment Agency pointed out, recycling is the most preferred option for MSW management

in the Netherlands. Already lying at 45 percent in 2001, it reached the 50 percent recycling target by 2009, eleven years ahead of the deadline. Official figures published by four ministries in September 2016 indicate that the recycling of plastic packaging has almost doubled in six years' time. The Dutch clothing giant G-Star Raw developed a clothing line made from different types of threads, containing 33 percent to 61 percent of recycled plastic. In 2014 paper and cardboard is already recycled by 82 percent; for metals, the level is even 94 percent. All in all, the quota of recycled household waste is mediocre, compared to European average. But the second National Waste Management Plan introduced a target to increase the recycling of household waste to 60 percent by 2015.

## The leading waste importer

Germany Trade & Invest underlines the Netherlands' proportionally high ratio of 31 percent of incinerated municipal waste. Twelve waste-to-energy plants – 60 percent of the incineration capacity is in public hands – are online providing for 18 percent of energy from renewable resources. Although since March 2010 plants with R1-Status are allowed to shredder residues thermically instead of depositing them, the becoming of overcapacities especially in the beforementioned twelve plants led to increasing waste imports. To speak with the words of the "Het Finan-



cieele Dagblad” newspaper, the Netherlands developed to the leading waste importer in a short period and outran Sweden and Denmark. In 2012 the country took about one billion tons of waste to use as energy from abroad, mainly Ireland, the UK and increasingly Italy – 14 percent of the total national volume. According to Vereniging Afvalbedrijven director Dick Hoogendoorn, this could rise to nearly 17 percent in the next few years. But the branch also feared that the tax, imposed on the disposal and incineration of waste in April 2014, could lead to waste exports benefiting firms from neighbourhood countries. If no tax would be imposed on the export of waste, this could in the long run lead to estimated 2.2 million tons exported abroad, affecting 35 percent of the total amount of domestic waste available for incineration.

### **Waste market dominated by private ventures**

According to Germany Trade & Invest, regulated by law disposal and recovery of municipal waste falls to communities and is seldom organized by Public-Private-Partnerships. The waste and recycling market in the Netherlands is dominated by private firms – an ongoing trend. The statistic bureau CBS stated 785 companies engaged in the treatment and recycling of solid and liquid waste in January 2014, mostly little and medium-sized, among them more than 155 metal recyclers, 60 plastics recycling businesses, 130 waste management service providers and 30 firms active in the waste-to-energy sector. The greatest actors in the market are van Gansewinkel, Shanks, Sita, Indaver, Attero und HVC, standing for about 40 percent of the total turnover.

However, the organization of waste treatment cannot be described in a few words. Wilma Mansveld, State Secretary of the Environment, tried a brief outline: “Currently, 75 percent of the remaining capacity for landfill and 60 percent of the incineration capacity is in public hands. The City of Amsterdam, for instance, has its own incineration plant. Others are owned by groups of municipalities – like HVC, which is owned by 48 municipalities and 6 water authorities. Provincial authorities are the main shareholders of companies like Attero.” Investments from abroad must not be forgotten: In July 2016, the Japanese Mitsubishi Materials Corporation for example started to invest 30.8 million Euros in an e-scrap sampling center named MM Metal Recycling B.V. at the Port of Moerdijk, that is expected to become operational in 2017.

### **A circular economy by 2050**

Regardless of the current industrial structure, the central target of waste treatment in the Netherlands is clear: a circular economy by 2050. In September 2016 the government launched a comprehensive program for a “national raw materials agreement”. Minister Sharon Dijksma (Infrastructure and the Environment) and Minister Henk Kamp (Economic Affairs) made agreements with the Dutch business community, government authorities, and NGOs aiming at realizing a one hundred percent circular economy. The Dutch Cabinet declared its intention

to sit down with the three largest banks – ABN-AMRO, Rabobank, and ING – that have already stated their willingness to support investments in circular projects. The Cabinet intended to take decisions in the current cabinet term to further stimulate investments by supporting private sector initiatives and entrepreneurs with developing revenue models.

Further financial opportunities are provided by European structural funds and the European Fund for Structural Investments (the so-called Juncker fund). Sharon Dijksma announced the availability of 27 million Euro to – inter alia – make it easier for the 7,000 primary schools in the Netherlands to separate their waste. And the Ministries of Environment, Interior, Public and Foreign Affairs published a Government-wide Program with three strategic goals: high-quality utilization of raw materials in existing supply chains; replacement of fossil-based, critical and non-sustainably produced materials by new sustainably produced, renewable, and generally available raw materials; and development of new production methods, new design products, differently organized areas as well as newly promoted ways of consumption.

### **An extra turnover of 7.3 billion Euro per year**

The paper makes clear, that financing this program means investments in circular products and services with a special character, as they have “a different risk profile, different depreciation periods, and a different cost-benefit balance from linear products”. Besides that, little is known about circular business models. Nevertheless, the Netherlands Foreign Investment Agency – citing the Netherlands Organisation for Applied Scientific Research – expects the forthcoming circular economy to generate an extra turnover of 7.3 billion Euro per year, accounting for 54,000 jobs, and calculates a reduction of material amounting to 100,000 kilotons. The Rabobank is quoted with an estimation of an extra growth in GDP ranging from 1.5 billion Euro in a business-as-usual scenario to 8.4 billion Euro in the most circular economic scenario.

More than that, in an open letter the Ministry of Infrastructure and Environment wanted the Cabinet “to contribute to creating the proper international conditions” for the transition to a circular economy. Towards this end, a platform called Holland Circular Hotspot should be set up. Within this platform, the Cabinet could invest in international partnerships and also take the initiative of concluding more international Green Deals and covenants.

### **Benefiting climate, income and jobs**

If programs, proposals and investments would be realized one day in the distance, the dreams of Minister Kamp could come true: “The ambition of the Cabinet is to adopt a more effective, smarter, and more profitable approach to the utilization of scarce raw materials and residual flows, together with the business community, knowledge institutes, and government authorities. Thus we are building a circular economy that will not only benefit our climate, but also generate income and jobs.”

## Plastic Recycling Market Will Continue to Grow

The global plastic recycling market is anticipated to flourish in the coming years due to the stern stance of developed regions to ban plastics and reduce the dumping of plastic wastes in landfills.

According to a market research, offered by online catalog Market Research Reports Search Engine (MRRSE), the global plastic recycling market has been gaining a steady momentum over the past few years due to the growing awareness about carbon emissions and the need to reduce them. Citing this reason, the report states that the global plastic recycling market, which was valued at 31.5 billion US-Dollar in 2015, is expected to reach a figure of 56.8 billion US-Dollar by 2024. During the forecast period of 2016 and 2024, the global market is expected to progress at a compound annual growth rate (CAGR) of 6.9 percent. On the basis of region, Asia Pacific is expected to be dominant in the global market throughout the forecast period. As reported, analysts anticipate that China alone will make a contribution of over 50 percent to the global plas-



Photo: O. Kurth

tic recycling market. "Presently, Asia Pacific is the key importer of plastic scrap for recycling with China and India leading the way," MRRSE informed. "The region is aggressively engaged in activities such as parings and converting the plastic scrap into recycled resins for further applications. Cheap labor and relatively lenient governmental regulations have kept the region at the forefront."

Europe is also expected to show steady growth in the global market

due to stringent laws pertaining to the use of plastic in the region. "The region is currently recycling more than 4.4 million tons of plastic wastes ever year due to ban on dumping plastic scrap in landfills," the report provider stated. "Furthermore, the increasing awareness about protection of the environment is also anticipated to boost the Europe plastic recycling market."

➔ [www.mrrse.com/plastic-recycling-market](http://www.mrrse.com/plastic-recycling-market)

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# Brexit Impacts on UK's Residual Waste Arisings and Treatment Capacity

Photo: jandedesign / fotolia.com

Under a high recycling scenario, which could result from a 'soft' Brexit, the UK's supply of capacity will exceed the available quantity of residual waste in 2020/21 – or in 2023/24 if the export of refuse derived fuel (RDF) is excluded from the analysis.

**T**he worst case scenario for a 'hard' Brexit, where there is no reduction from today's UK residual waste arisings, indicates that 1.7 million tons per annum of residual waste might continue to be available for treatment – or 5.3 million tons, if exports are excluded. These are the key figures of the eleventh issue of Eunomia's biannual Residual Waste Infrastructure Review that examines the implications of Brexit for residual waste treatment in the UK.

Reductions in residual waste and the development of new facilities have closed the UK's capacity gap to 10.2 million tons, down from the 12.9 million tons reported in May. Meanwhile, the UK continues to invest in more EfW capacity, with the last six months seeing a number of facilities reaching financial close. There is now 6.3 million tons per annum of treatment capacity under construction or committed, while several new projects are applying for planning consent. However, the UK's decision to leave the European Union has brought uncertainty in many areas.

The long-term nature of investments in residual waste infrastructure makes them particularly reliant on confidence regarding the future shape of the market.

## Soft or hard Brexit?

In the event of a soft Brexit, in which the UK maintains access to the Single Market and continues to aim for the same recycling targets as the rest of Europe, the country is on track for the supply of waste treatment capacity to exceed the available quantity of residual waste in 2020/21.

The possibility of a hard Brexit, though, might have quite different implications, depending on the policy direction the UK takes. The report considers a 'worst case' scenario for resource management, where the UK's residual waste arisings stay at current levels, despite expected reductions in Scotland and Wales. This creates a difficult environment in which to plan for the right facilities to meet the UK's



needs, and the uncertainty could lead developers to consider additional investment in UK treatment capacity.

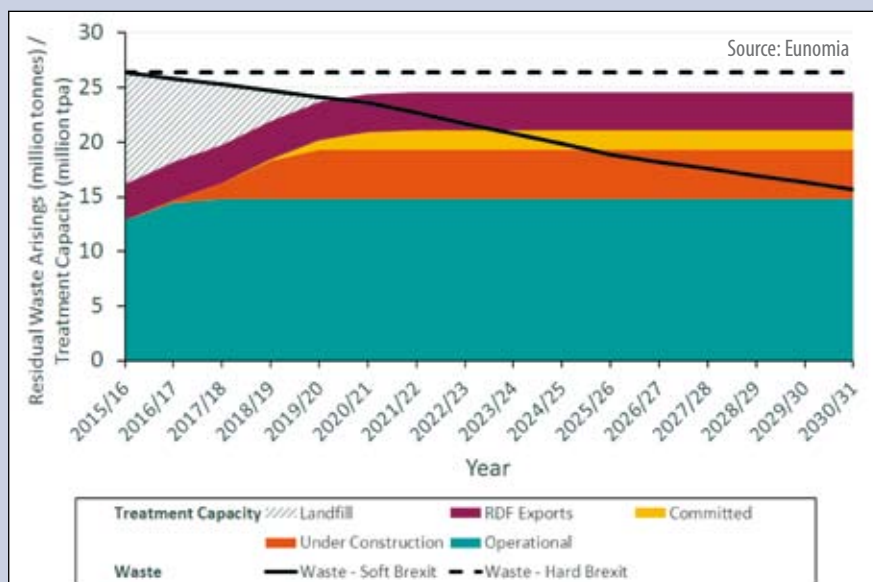
### Likely to meet the 2020 target

The recycling rate is a key determinant of the amount of residual waste requiring treatment. The UK is working towards the 50 percent municipal waste recycling target set by the revised Waste Framework Directive. The EU has set out plans for recycling targets of 60 percent by 2025 and 65 percent by 2030 in its Circular Economy (CE) Package. A hard Brexit could in principle see the UK set these targets aside – although this would not necessarily affect Scotland and Wales, which are already aiming for high levels of recycling under their own legislation. However, the UK government might itself recognise the potential advantages of better resource management and itself pursue higher recycling rates, even under a hard Brexit scenario.

With Brexit unlikely to occur before 2019, it is probably that in the meantime the UK will continue its efforts to meet the 2020 target. Whether the UK adopts subsequent targets will depend on the eventual timetables for Brexit and for the CE Package, and the drafting of the Government's proposed Great Repeal Act, which will see a snapshot of EU law transposed into UK legislation.

### RDF exports meet Europe's appetite

The UK's need for treatment capacity is also increasingly affected by the amount of residual waste that is exported to the continent as refuse derived fuel (RDF). Initial data for 2016 suggests that RDF exports from the UK will reach 3.5 million tons, up from 3.3 million tons in 2015. Eunomia's analysis indicates that even a hard Brexit is unlikely to place any legal barrier to RDF exports. The EU rules on waste shipments mimic a wider OECD agreement, of which



the UK and the countries to which it exports are signatories. However, if Sterling weakens against the Euro, or if a 6.5 percent EU import tariff proves to apply to RDF, export may become a less financially attractive option – unless continental incinerators opt to reduce their gate fees so as to continue to attract the waste they need.

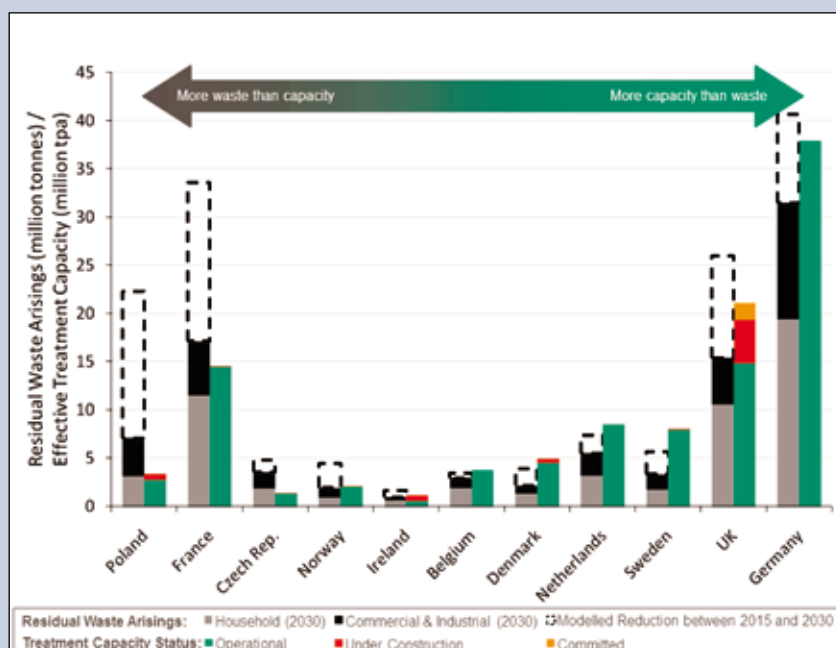
But Europe's appetite for RDF from the UK appears likely to increase over coming years, as EU Member States seek to increase their recycling rate, while some continue to increase their treatment capacity. The current capacity gap of 58 million tons will reduce rapidly, and the "Northern Cluster" of countries engaged in the RDF market seems set to reach a situation of potential over-supply of capacity from 2026 onwards.

### Fresh look or still 65 percent target?

Eunomia's Managing Director, Mike Brown, explains: "While we cannot yet say with confidence what form Brexit will take, a hard Brexit could mean taking a fresh look at our need for waste treatment infrastructure. However, there is a risk that during the current period of uncertainty the UK may invest in facilities that could hinder our ability to achieve higher levels of recycling. A soft Brexit is likely to see us still aiming for 65 percent by 2030. That's still the direction of travel for the rest of Europe, and the result looks set to be a big increase in spare treatment capacity to be filled by RDF exports."

Eunomia's report continues to be the only source of estimates through to 2030 and beyond. The long term nature of residual waste treatment facilities means that it is crucial for investors to understand how the waste market can be expected to develop over the coming decades.

The full issue 11 of Eunomia's Residual Waste Infrastructure Review is available under [www.eunomia.co.uk/reports-tools/residual-waste-infrastructure-review-11th-issue](http://www.eunomia.co.uk/reports-tools/residual-waste-infrastructure-review-11th-issue).



# Lebanon: Waste Management Policy Wanted



**Lebanon's waste management seems to resemble many others in threshold nations. Of the daily amount of roughly 4,500 tons to 5,000 tons of municipal solid waste, 48 percent is landfilled, 29 percent openly dumped, 15 percent composted and only 8 percent recycled.**

Latest figures indicate 504 municipal solid waste MSW dumps and 166 construction and demolition waste dumps in Lebanon. An elder paper edited by the International Labour Office and UNDP explained that "Lebanon lacks any comprehensive strategy or efficient system to handle industrial and hazardous waste. As a result, the waste management system is rapidly reaching its capacity and operational limits". These limits were reached sooner than expected.

## 28 recycling companies

Lebanon's municipal waste has potential capability. Apart from 60 percent organic waste – primarily because of exuberant hospitality and the makeup of the Lebanese cuisine –, it is composed of 20 percent paper and cardboard, 5 percent glass, 4 percent metals and 2 percent plastics. Allegedly various projects have been undertaken to rehabilitate waste disposal sites, namely Normandy, Beirut, Slayeb dump, Zahleh dump and recently Saida dump. The Italian ROSS Program decided to invest in the development of a sound solid waste management strategy in Lebanon and started a few pilot initiatives. A country report by the Solid Waste Exchange of Information and Expertise Network in the MENA Region (SweepNet) presents a number of small and medium sized sorting and composting plants – part of them under construction – that have been implemented by the Office of the Minister of State for Administrative Reform through EU financing: "The municipal investment projects in solid waste management" resulted in the construction of 12 solid waste facilities, the delivery of 13,788 solid waste collection containers and 59 solid waste collection and handling vehicles. And the American Univer-

sity of Beirut Solid Waste Management Task Force spoke of 28 recycling companies for treatment of plastics (13), metals (10), paper (8), glass (3), electronics (2) and tyres (2) in 2016.

## Low separate collection rate

But not all that glitters is gold. A register published by Localiban, the Centre de ressources sur le développement local au Liban, points out that – if not handling it to Sukleen – very few municipalities manage to separately collect their waste and even fewer intend to recycle it, relying on private companies. And that the high cost of waste collection and burial in Lebanon prevents municipalities from living up to their responsibilities resulting in wider budget deficits and failure to pay the fees required for collection and treatment. Meanwhile, the collection of reusable and recyclable materials in Lebanon is mainly handled by estimated 2,000 to 4,000 informal scavengers in urban centers and around dumpsites.

The industrial waste must not be forgotten, even if the figures are antiquated: As the U.S. National Center for Biotechnology Information announced in 2001, the (mostly small-scale) industries generated solid, liquid and hazardous waste estimated at 346,730 tons/year and between 3,000 to 15,000 tons/year, respectively. The Worldbank spoke of 100,500 tons industrial hazardous waste per year containing chemical, petroleum and coal production waste and more than 4,000 tons of medical hazardous waste in 2002. And balanced that "in the absence of a specific hazardous waste management program, industrial solid waste, including hazardous waste, is collected with domestic solid

waste and transferred to disposal sites. Liquid waste is often discharged into rivers and the sea."

### A deficient legislative framework

In 2001, the Center for Biotechnology Information characterized the Lebanese waste management policy as a "deficient institutional framework, a lack of adequate environmental laws, and lax enforcement of regulations governing industrial-waste management". In 2014 Sweet-Net found themselves forced to judge that there was no specific legislative framework dealing directly with solid waste management in Lebanon. The framework law for the protection of the environment – adopted in 1988 and amended in 2002 – does not provide regulating details for the solid waste management. Only Decree 8735 of 1974 assigned solid waste management as a municipal responsibility, and Decree 9093 of 2002 provided municipalities with an incentive to host a waste management facility addressed the sector specifically – a very weak frame of regulations and directives.

### Sukleen and the Naameh landfill

Roughly half of the total amount of waste in Lebanon is generated in Beirut and in 225 towns and villages in Mount Lebanon; its handling was mainly outsourced by contract to private collecting company Sukleen. Sukleen – judges the international radio station Deutsche Welle – was not very ambitious in further handling either: The collected waste was little or not treated and dumped in the Naameh landfill South of Beirut. Naameh landfill was opened in 1997 with a capacity for ten years. But the landfill was left open until it accumulated eight times its capacity and was closed caused by protesting residents in July 2015. Sukleen stopped the collection, no alternative could be found, and in the absence of governmental solutions the vast majority of municipalities saw their waste openly dumped on streets, under bridges, on riverbanks, in valleys or in being burned in open dumps. In July 2015, the Minister of Environment, Mohammad Machnouk, an-

nounced that the trash crisis would be solved in a fortnight. In fact, several days later he urged the cabinet "to declare an environmental state of emergency in Lebanon, for fear of a trash catastrophe, the solution to which remains disrupted by politicians." In October 2015, he signaled "best efforts" to find landfills within a decentralist solution, but "faced procrastination and deficiency by the political forces that failed to ensure the required coverage in this regard". And in January 2016, he had to admit that "following the political inability to find an ecological landfill, the government was forced to resort to the exportation of waste." Actually the Government of Lebanon approved a – not implemented – plan to export household trash to Sierra Leone or Middle-Eastern countries.

### The refugee crisis

At that time, the minister had to face another, bigger problem: the Syrian refugees. Already 2013, the UNHCR spoke of registered 1.3 million Syrian refugees in a country crowded by 4 million Lebanese people. Antoine Chedid, Ambassador of Lebanon to the United States, is quoted that this overpopulation affected most sectors: "the economy, trade, public finance, health, education, safety, the labor market, infrastructure, traffic, and waste management". In February 2016, during the UNDP Conference on Environment, Mohammad Mashnouk had to confess his nation's "helplessness in implementing environmental procedures" due to the severity of the Syrian crisis' impact on the Lebanese environment. He numbered the necessary intervention priorities to 2.8 billion Euro.

The EU Commission assisted Lebanon amongst others in the "promotion of sustainable and transparent management of energy and natural resources". So the European Neighbourhood Instrument funded the upgrading of solid waste management capacities by 21 million Euro. Waste water projects and road transport infrastructure were additionally benefited by the European Investment Bank (EIB). And regarding the refugee problem, the European funding amounted to 489.6 million Euro for humanitarian

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and developmental targets “addressing both refugees and host communities’ needs in particular when dealing with infrastructures: water, waste water, solid waste management but also in the health and education sectors”.

### The political “problématique remains”

But the financial aid was no support to end the waste management policy difficulties. In October 2016, Mohammad Machnouk wrote: “In the absence of a formally adopted law for Integrated Solid Waste Management, initially proposed by the Ministry of Environment in 2005 and forwarded to the Parliament in 2012, the problématique remains a shared responsibility between a number of concerned ministries and administrations.” Or in the words of the Deutsche Welle, appraised at the end of December 2016: “The Government has not yet found a political solution.” The public was enraged. Already in 2013, a country report denoted that in spite of some campaigns and implementations of solid waste management facilities the public was highly suspicious about such facilities, had not perceived positive outcome and could not identify direct benefits from participation.

In 2015, thousands of people demonstrated against the waste policy or took part in actions against incinerators and for zero waste. “We in Lebanon are fully capable of managing our own waste through minimization programs and safe domestic recycling”, stated Naji Kodeih of Lebanese environmental organization IndyACT. Civil organizations took hold of solving the garbage problem themselves and stand for the device: “We are merging two problems into a solution – the waste crises and the refugee crisis”. And Cedar Environmental of engineer Ziad Abi Chaker delivers zero-waste-plants that treat waste for 58 Euro per ton whereas Sukleen took 122 Euro per ton. Abi Chaker: “The only way to convince the government of recycling is to present results that make economically sense.”

The situation is messy, solutions rare and proposals cheap. Karim Hammoud, deputy general manager at privately

funded company IBC, for example was sure that Lebanon needs almost four or five more companies similar to IBC and estimated the initial capital required to build a single company with a capacity of 500 tons to be 37.7 million Euro at a return of the investment of 20 percent. Sweep-Net in cooperation with the German association for international collaboration urged financial support – sustainable and including a cost recovery plan to secure that the facilities will be operational: “Make use of all the funds and loans provided to the municipalities from various donors like the EU, USAID, YMCA, World Bank, etc., in an orderly manner compatible with the local needs and priorities.” In 2014, the U.S. Department of State was convinced that Lebanon offers tremendous opportunities in energy-related sectors and “is keen to attract U.S. investment because of its state-of-the-art capabilities in technology, know-how and competitiveness”, as the country “traditionally has remained open to foreign direct investment”.

Investment company Bloominvest reminds of introducing a tax on every ton of material landfilled to give waste processing companies the incentive to look for other methods such as incinerating and recycling. The Solid Waste Management Task Force at Beirut demands a municipal solid waste management roadmap requiring an effort from all stakeholders including government institutions, local authorities, recycling companies, non-governmental organizations, farmers, commercial institutions, and service users. And the Investment Development Authority of Lebanon prefers the adoption of a zero waste strategy in Lebanon that can generate 127.7 million Euro over a period of 20 years: “This can be achieved through investments in web-based recycling platforms and waste-to-energy technologies.”

However: It is predictable that waste generation in Lebanon will grow. Some figures indicate a growth to 2.4 million tons by 2035, some predict 3 million tons exclusive of the Syrian refugees already in 2020. Anyway this seems to be too much for a country that is scarce in land disposal and minimal cost recovery.

## Catalyst Regeneration Market Will Grow

**According to a report, published by US company Zion Research and sold by [www.marketresearchstore.com](http://www.marketresearchstore.com), the global catalyst regeneration market stood at nearly 1.5 million tons in 2014 and will grow at a CAGR (compound annual growth rate) of around 4 percent to 4.7 billion US-Dollar by 2020.**

Catalysts are widely used in different chemical processes in petroleum refineries, chemical and petrochemical facilities, environmental processes etcetera. Regenerated catalysts are growing in popularity as reactivation technologies and can restore more than 90 percent of activity. Recycling of catalysts provides cost effective substitute for expensive virgin catalysts. Moreover, recycling saves cost involved in disposal of used catalysts. In the light of these benefits, the catalyst regeneration market is expected to witness fastest growth as compared to the virgin catalysts market. “However, certain environmental concerns associated with the recycling of catalysts are expected to limit the growth of this market,” the report provider admits. “Moreover, rejuvenated catalysts some time may not give optimum yield as compared to fresh catalysts.”

More information:

➔ [www.marketresearchstore.com/report/catalyst-regeneration-market-z38072#tableOfContent](http://www.marketresearchstore.com/report/catalyst-regeneration-market-z38072#tableOfContent)

## Brazil: New Platform for the Plastics Industry

In March this year, the new trade fair Plástico Brasil took place at the São Paulo Expo Exhibition & Convention Center.

According to the organizers, the new event is an initiative by the Brazilian Machinery and Equipment Builders' Association (ABIMAQ), and the Brazilian Association of Chemical Manufacturers (ABIQUIM), with organization and promotion of Informa Exhibitions. "Since it is the official exhibition of the sector, Plástico Brasil has exclusivity in partnership with Apex-Brazil (Brazilian Trade and Investment Promotion Agency) for the implementation of the program that promotes exports of the Brazilian Machinery Solutions," as their homepage declares.

The main entities related to the industry in general, to the plastics and rubber and to other segments have confirmed their support to Plástico Brasil. On the international level, there is the only Brazilian exhibition to receive official support from EURO-MAP – European Plastics and Rubber Machinery, which aggregates European plastics and rubbers machinery manufacturers.

Appointed entities and sectorial exhibitions from other countries have also come to terms with a partnership

with Plástico Brasil, such as the Mexican ANIPAC (National Association of the Plastic Industry), Colombiaplast (International Plastics, Rubber and Petrochemical Trade Fair), ASEPLAS (Ecuadorian Plastics Association), API-PLAST (Peruvian Association of Plastic Industry), CAPI (Argentine Chamber of the Plastics Industry) and the SPI (Plastics Industry Trade Association).

### Recycling: an important issue

As reported, by gathering the whole industrial chain of plastic, Plástico Brasil was created with the mission to leverage the development of the industry of machinery, equipment and accessories, and to stimulate the fulfillment of business with buyers from Brazil and abroad, seeking news, trends and innovations for the most varied applications.

Recycling was also an important topic. According to the information, for approximately 11,000 Brazilian national companies in the plastic processing industry, with so many modern possibilities for environmentally-friendly operations, this sector continues to

show vital importance to the industry. In the industry's last performance report, commissioned in 2012 by Plastivida from MaxiQuim, it was established that the domestic recycling industry mechanically recycles 21 percent of all post-consumer plastics in the country. At that time Brazil had recycled 684,000 tons from a total of 3.26 million tons of post-consumer plastic generated. The sector had 762 recyclers – a considerable portion was concentrated in São Paulo (39 percent) and in the Southern Region (36 percent) – with installed capacity of 1.7 million tons, and directly employed 18,700 people.

"The importance of this statistic, however, is even greater when the details are observed. More and more, recycled plastic, according to the study, yields greater added value," a press release said in February this year. "As such it has gained significant traction in segments with greater technical and quality requirements, such as the automotive industry and construction equipment, which results in considerable extension of its business value."



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## European Plastics Industry and the Circular Economy

The industry association PlasticsEurope has created a new Plastics Packaging Circular Economy Group, which will be working with the value chain to maximize the fullest potential of plastics in delivering superior resource efficiency gains within the circular economy.

Plastics packaging in today's society adds significant value to contain, protect and preserve a wide range of products. "However, more can be done," PlasticsEurope, the European trade association with centers in Brussels, Frankfurt, London, Madrid, Milan and Paris, said. It believes that it is important to further strengthen the engagement with all actors within the supply chain and work in a more holistic way. "This will enable to deliver innovation that further increases the resource efficiency of plastics and ensure their recovery at the end of their useful life. At the same time, it should prevent the leakage of any waste into the environment."

### Polyolefin Circular Economy Platform (PCEP)

In October last year, three European plastics industry organizations (Plastics Europe, European Plastics Converters and Plastics Recyclers Associations) have launched a Polyolefin Circular Economy Platform (PCEP) through which the industry calls on all actors to join them in driving towards this goal and play their part.

The plastics industry recognizes that a business as usual approach will not enable the proposed challenging target for 55 percent plastic packaging "preparing for re-use and recycling" by 2025, as outlined in the European Commission's Circular Economy Pack-

age. In the drive to create a more circular economy, fresh approaches and new thinking are required. As reported, this newly formed platform will be working for a 5 to 10 year horizon based on effective, science-based solutions. "The platform will create a multi-stakeholder group that will seek to identify the barriers and opportunities to increase Europe's recycling and work towards ensuring the supply of high quality recycled plastics for the European market," PlasticsEurope pointed out. "Correspondingly, this will drive economic growth and the creation of new jobs as Europe moves towards a more circular economy."

### The European plastics industry

The European plastics industry is an integral part of the manufacturing in Europe, with over 62,000 companies providing more than 1.4 million jobs and annually contributing more than 26 billion Euro to public finances. According to the latest figures presented by PlasticsEurope during the K 2016 in Düsseldorf (Germany), the world production level of plastic materials has increased from 311 million tons in 2014 to 322 million tons in 2015. As reported, the European plastics industry ranks second in world production and continues its stable trend with a share of around 18 percent of the world production. Yet China remains the largest producer with over 27 percent of world production.

At the European level, the plastics demand was 49 million tons. Plastics producers have benefited from the recovery of its customers' industries such as the packaging sector which stands for almost 40 percent, building & construction with around 20 percent and automotive sector with nearly 9 percent of the total demand. The European country with the highest demand is Germany with approximately 25 percent, followed by Italy with over 14 percent and France with almost 10 percent.

In 2015, the European plastics industry has maintained a positive trade balance of over 16.5 billion Euro. For plastics producers, the top trading partners for exports (in value) outside the EU were Turkey with over 13 percent, China with around 12 percent and USA with almost 12 percent. The main partners for imports from outside the EU were: USA with approximately 25 percent, Saudi Arabia with about 13 percent and South Korea with over 12 percent.

As for the plastic waste treatment management data for Europe, latest figures are from 2014. Compared to 2012, the data from 2014 shows that almost 26 million tons of post-consumer plastic waste ended up in the official waste streams (+1 percent). Almost 70 percent was recovered through recycling and energy recovery processes, while around 30 percent still went to landfill. According to PlasticsEurope, in view of the European Commission's proposal to stimulate Europe's transition towards a circular economy, the industry is convinced that this initiative offers an opportunity to accelerate a shift towards a resource efficient and competitive Europe. "To make this happen, proper waste management coupled with suitable measures at European and global level are needed to respond to the problem of plastic waste in the environment."

➔ [www.plasticseurope.org](http://www.plasticseurope.org)



Photo: Messe Düsseldorf, Constanze Tillmann



## Global Trade Data Visualizer

In February, the International Aluminium Institute (IAI) has launched a new web-based tool to visualize the aluminium value chain, from bauxite to scrap, including inter-regional trade flows. "In a fast changing sector, which has seen new regions of production and consumption – led by China –, grow at unprecedented rates in recent years, understanding inter-regional flows of raw materials and final products has never been more important," the global association of aluminium producers is convinced. The IAI's mass flow visualization allows users to manipulate an animated Sankey diagram, showing the production, consumption and trade of bauxite, alumina, ingots (primary and recycled), semis, final products and scrap across nine regions over the period 1962 to 2014.

Among other things the animation shows that:

- In 2004, 15 million tons of scrap were available worldwide. In 2014 this scrap availability had increased to 26 million tons.
- North America, historically the largest generator of scrap globally, has been overtaken by China, which generated 6.5 million tons of scrap in 2014.
- In 2014, 17 million tons of aluminium contained in final products were traded between the nine regions, followed by aluminium contained in bauxite (15 million tons), aluminium contained in alumina (14 million tons), ingots (12 million tons), semis (5 million tons) and scrap (4 million tons).

2015 data will be added in the next few months and 2016 data by the end of 2017.

➔ [www.world-aluminium.org/statistics/massflow/](http://www.world-aluminium.org/statistics/massflow/)

## USA: Memphis Region Recycling Gap Analysis

A new report provides an overview of a recent collaborative effort called CART – the Coalition to Advance Recovery in Tennessee. According to the company's own information, beverage carton producer Tetra Pak is committed to supporting local partnerships and projects to help increase recycling rates. For this purpose the company published a report, which also shares the results of a recycling system gap analysis performed in the Memphis Area. As reported, the data gathered during the Memphis Region Gap Analysis presents a way to measure uptake of recycling best practices, provides recycling program details and benchmarks performance for municipalities and counties in the region. "It also provides clear opportunities to develop hub and spoke recycling systems in this city region," the company said. Increasing material recovery in Tennessee to the national average and beyond would further the interests of both the public and private sectors. "It will produce thousands of processing and manufacturing jobs and build upon an existing, steady base of infrastructure in the state. Local industries are hungry for the additional feedstock and it makes sound business sense to use local materials."

➔ [www.tetrapak.com/us/sustainability/carton-recycling](http://www.tetrapak.com/us/sustainability/carton-recycling)

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## USA: Landfilling is No Longer the Easy Way Out

**Communities are increasingly embracing the vision of the circular economy. Private investment in recycling infrastructure spurs transition to zero waste.**

In Billings, Montana, trash in every variety covered the streets around the local landfill on March 8, 2017. High winds from recent storms in the U.S. Midwest had blown it there. This was not an isolated incident. These types of wind occur several times a year in the area, typically in the spring and fall, each time requiring an army of workers to clean up the debris. The recent developments will make it even harder for the city seeking permission to expand the Billings landfill. This shows that dumping waste is no longer the easy way out for communities in the United States.

One does not have to look very far for more examples. The Pennsylvania Department of Environmental Protection is questioning earthquake safety at its landfills. In Pennsylvania seismic activity has become more frequent with the state's extensive fracking for oil and gas. The state of New York is facing a 2.4 billion dollar suit over its landfill in Niagara. Residents say that harmful chemicals are migrating from the landfill, causing health issues. The Environmental Protection Agency (EPA) currently lists 154 complaints against new landfills or requests to increase capacity.

In the U.S. total annual Municipal Solid Waste (MSW) generation has in-

creased by 68 percent since 1980, currently amounting to 254 million tons per year. Per capita MSW generation has increased by 20 percent over the same period of time, from 3.7 pounds (1.67 kg) to 4.4 pounds (1.99 kg) per person each day, or 1,606 pounds (728 kg) per person per year. For comparison, MSW (residential waste) generation per capita in Germany amounted to 618 kilograms in 2014. The EU average was at 474 kg.

Zero waste to landfill is the new buzzword, as the concept of a circular economy has become popular among American communities. The individual states' responses to the waste challenge differ as much as they do among the members of the European Union. Yet, government officials, manufacturers and recyclers from West Coast to East Coast have been moving in the same direction. Landfill diversion mandates as ambitious as 75 percent by the year 2020, issued by the state of California, are in place, along with landfill bans for organics and electronic waste, for example in California, Oregon, Arizona, Pennsylvania, Illinois, Wisconsin and New York.

While the new administration under President Trump has created uncertainty about the nation's future course

in the environmental arena, state legislators and corporate decision-makers alike are showing great resilience. Google's Senior Vice President of Technical Infrastructure, Urs Hölzle, stated in a recent post: "We're more committed to the environment than ever and believe that businesses, governments, and citizens all have critical roles to play to ensure that we all have clean air, water, and soil."

Google's offices in Mountain View, CA make up 8 percent of all businesses in the bustling area. After a waste audit undertaken by local waste service provider Recology, compost and recycling containers were introduced throughout the Google campus and educational programs for its employees were rolled out. The company now has more recycling bins than it has trash bins and achieved a waste diversion rate of 68 percent compared to 37 percent in 2011. "Our goal is to embed circular economic principles into the fabric of Google's infrastructure, operations, and culture," Kate Brandt, Head of Sustainability at Google, said in an interview with the U.S. magazine Fast Company.

In the United States, private initiative has a long history of acting as a strong driver in areas where government falls short. The Closed Loop Fund,

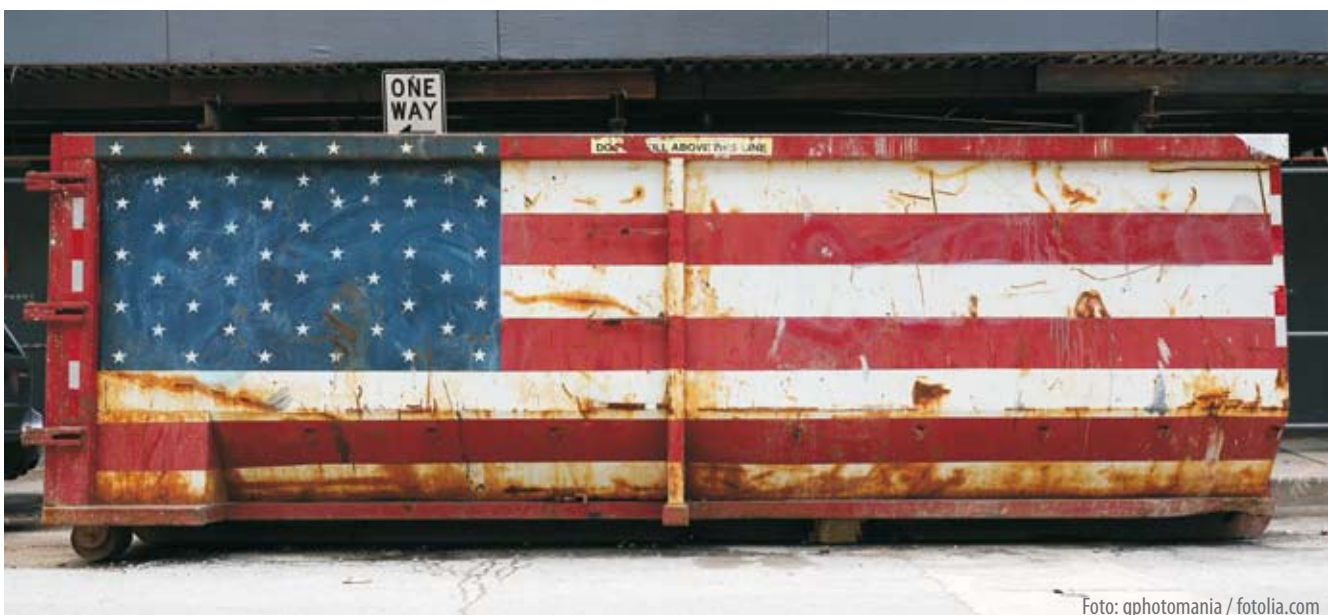


Foto: qphotomania / fotolia.com



founded in 2014, is a great example of environmental stewardship with a bottom-line approach. Through private investment of 100 million dollars the Fund provides zero-interest loans to municipalities and below market interest loans to companies for recycling infrastructure. The investment categories include collection systems to expand curbside programs for a wide range of materials, sorting infrastructure and processing technology to create marketable commodities from waste. Corporate investors of the Fund include the Walmart Foundation, Coca-Cola, Pepsico, Johnson & Johnson, Procter & Gamble, Unilever, 3M and Goldman Sachs. Some weeks ago, the Closed Loop Fund issued another request for proposals on projects at material recovery facilities (MRFs) or plastic recovery facilities that can collect, sort or process post-consumer polypropylene plastics. Through this program projects can receive up to 5 million dollars each.

Reducing food waste is another field which attracts private investment. The San Francisco-based collabora-



Foto: pixabay

tion ReFED is a cross-sector effort of over 40 businesses, non-profits, foundations, investors and policymakers. ReFED developed a roadmap to reduce food waste by 50 percent by 2030 and is actively seeking philanthropic and investment capital to spur technology, business and policy innovation throughout the United States. Current supporters include the National Resources Defense Council, the Rockefeller Foundation, several other family foundations, and once again the Walmart Foundation.

Regardless of where the Administration in Washington, DC moves, private initiative and state legislation to divert waste from landfills will not falter. Always the pioneer, California hosts the first International Circular Economy Conference and Exhibition (ICE-CON) on November 7 to 8, 2017 in Santa Clara, California. Santa Clara was chosen as a venue because it is at the center of the Silicon Valley, another green-minded community with deep pockets committed to stop the practice of dumping waste. Landfilling, according to a growing number of proponents, makes little sense, neither environmentally nor economically. Accordingly, ICE-CON focuses on forward thinking solutions for sustainable waste management, providing a forum for a truly international exchange of ideas and a showcase for technologies to make zero waste to landfill happen.

Preliminary Circular Economy Conference Program ➔ [www.ice-con.com](http://www.ice-con.com)

*Author: Dr. Ines Freesen,  
Freese & Partner GmbH*

## Enviro Involved in Chile's New Law on Producer Responsibility

**When Chile's recycling law will officially come into force in 2018, the Swedish provider of recycling plants for worn-out tires and processed materials, Scandinavian Enviro Systems AB, will have been involved in the introduction of the extended producer responsibility.**

The goal of the new law is to increase the country's reuse rates (currently at 10 percent) by reducing the volume of waste sent to landfills and dumps and promoting cultural change around the issue. It regulates six priority products: lubricant oils, electrical and electronic appliances, car batteries, batteries, packaging and tires. The Swedish company, which has been present for years on the Chilean market, is working together with the Chilean Ministry of the Environment and a number of the country's mining companies which have to dispose of their waste tires; Chile is one of the world's biggest markets in mining. "The aim is to establish recycling facilities to solve the environmental problem caused by Chile's enormous numbers of waste tires," Scandinavian Enviro Systems AB underlined. The management of the Scandina-



Photo: Scandinavian Enviro Systems AB

vian firm believes that there is a huge market potential for its tire recycling technology in Chile and elsewhere in South America. Countries such as Peru, Brazil and Colombia also have a great need for viable tire recycling, the executives are convinced. "Once

we have established the first recycling plant, we can showcase the operation and how it works to other countries and operators, and that is our target right now."

➔ [www.envirosystems.se](http://www.envirosystems.se)



## Energy from Residues and Waste

There is a new path for the treatment of biomass and waste residues.

The German-based Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT has developed the innovative Thermo-Catalytic Reforming TCR. This new technology is able to convert biomass into synthesis gas, biooil, biochar and water.

To promote the technique, Fraunhofer UMSICHT founded the spin-off company "Susteen Technologies GmbH", based in Sulzbach-Rosenberg, which has been granted an exclusive worldwide license to the TCR technology for the production of sustainable fuels. Since then, there were two spin-off companies (Susteen Technologies UK and Susteen Technologies Canada Ltd.) established in 2016.

According to the information on the homepage of Susteen Technologies, the TCR technology is designed to process a wide range of waste or residual biomass including:

- fermentation residues incl. digestate from anaerobic digestion plants and lignin cake from bioethanol fermentation plants,

- agricultural/forestry residues (eg. animal manure, straws and husks, waste wood and road side clippings),
- industrial biomass residues (eg. brewer's spent grain, oil mill residue and paper sludges),
- municipal organic wastes such as sewage sludge from water treatment plants or composting materials.

Through a staged process, biomass is converted into high quality synthesis gas, biooil, biochar and water. The stages:

- Thermal Drying: Wet biomass is dried to 70 to 90 percent dry matter content through a combination of standard mechanical and thermal drying technology. The TCR technology itself can supply sufficient heat for thermal drying of biomass with 60 to 70 percent water content.
- Thermal Decomposition: In a first TCR reactor stage biomass is carbonized to biochar at intermediate temperatures (400 to 500°C) and volatile organic compounds are extracted.

- Catalytic Reforming: In the second TCR reactor stage the biochar is heated up to 600 to 750 °C and brought in contact with the volatile compounds again. Through catalytic functions the organic compounds are cracked to quality fuel gases and oils. The steam reforming of water and carbon increases the yields of a hydrogen rich synthesis gas.
- Product Treatment: Liquid compounds are condensed and the product synthesis gas is cleaned for particles and aerosols in a product treatment stage.

As reported, the TCR technology produces its own process energy through biochar combustion and on-site combined heat and power generation. According to Fraunhofer UMSICHT, Susteen Technologies is actively developing biomass applications based on TCR technology and provides the design and delivery of TCR reactor plants. First customer projects have already been won.

More information:

🔗 [www.susteen-tech.com](http://www.susteen-tech.com)

The TCR pilot plant at the technical center of Fraunhofer UMSICHT in Sulzbach-Rosenberg



Photo: Fraunhofer UMSICHT / Kurt Fuchs

## United Kingdom: There are Plans to Recycle Medium Density Fiberboards

**UK-based MDF Recovery Ltd. has developed a proprietary process to recover wood fibers from waste MDF (medium density fiberboard) and is convinced that the technology has moved a step closer to reality.**

MDF Recovery Ltd. has successfully concluded proof of concept trials to develop a commercially viable process to recover wood fiber from waste MDF, the company reported in January this year. According to the information, it is the culmination of more than six years' research and development to create a technology which will offer "the first alternative" to the use of landfill or burning to dispose of MDF. Britain, alone, would throw away around 350,000 tons of MDF each year.

"The solution generates a new raw material source for the wood/natural fiber industry that reduces the demand on standing forests," MDF Recovery Ltd. underlined. "The recovered fiber is of the same high quality as virgin wood fiber and provides feedstock to the manufacturers of MDF board, insulation products and horticultural growing products." Tests, conducted by the BioComposites Center at the University of Bangor in 2011, have shown that "the fiber quality (length and width) of the recycled MDF is similar to that of virgin fiber and would not be detrimental to MDF quality".



Medium density fiberboard (MDF) is an engineered wood panel product composed of refined virgin wood fibers, mixed with resin and wax and pressed into flat sheets under pressure and at elevated temperature

Now, the company is ready to take the proprietary technology to the commercial market. As reported, MDF Recovery Ltd. has begun discussions with a number of leading companies and organizations operating in the MDF production and waste industries. There are also discussions regarding licensing of the technology for use in MDF recycling plants throughout the world, it is stated on the website.

The managers of the British company look forward to progressing these during the early part of 2017, due to the benefits of this technology: It can be "retro-fitted or designed into new

plants and offers a robust solution for reworking waste and increasing the yield at the MDF manufacturing facility". As reported, the financial payback is dependent on the size of MDF plant but in larger plants is expected within 18 months.

### Market potential

MDF – medium density fiberboard – was first devised in the 1970s and today more than 50 million tons are produced globally every year, servicing the furniture, construction and do-it-yourself (DIY) markets. "Prominent markets outside of the UK include Continental Europe, USA, Russia, Brazil and China. The demand is increasing in Eastern Europe and Asia," MDF Recovery described the market potential. "It is estimated that between 30,000 and 60,000 tons of MDF waste could be recycled by MDF Recovery each year in the UK and almost 3 million tons globally."

The company has set up an advisory panel to help it commercialize the technology.

➔ [www.mdfrecovery.co.uk](http://www.mdfrecovery.co.uk)

Photo: pixabay

## New Biogas Plant with Nitrogen and Phosphorus Recovery

**In November last year, the first biogas plant on an industrial scale – equipped with Ductor's nitrogen and phosphorus recovery technology – was put into use in Tuorla (Finland).**

According to the Finnish company Ductor, the plant is capable of treating 1,400 tons of poultry manure each year, producing 266,000 m<sup>3</sup> of biogas, 115 tons of ammonium sulfate, and 640 tons of solid organic phosphorus fertilizer. The firm's "proprietary nitrogen-control technology harnesses the power of underutilized bio-waste such as poultry manure into clean and renewable energy as well as organic fertilizers", the Helsinki-based technology provider underlined. As reported, the biological method developed and patented by the Finnish company eliminates the nitrogen dilemma by turning problem waste into profitable recyclable goods. The German Fraunhofer Institute for Environmental Safety and Energy Technology UMSICHT has been supporting the development of Ductor's technology for removing ammonia since 2013. It will also evaluate its first industrial-scale plant in Germany, which is currently under development. Removing 60 percent of nitrogen – before biogas fermentation – is an innovation for the biogas industry. This is done by adding one fermentation step, prior to biogas fermentation, and a nitrogen stripping unit. "This solution opens up a variety of new possibilities for improving the biogas economy and nutrient recycling," the Finnish-based technology provider is convinced. "Ductor's technology has a global market, since the demand for solutions to improve the profitability of biogas production is tremendous everywhere."

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



## UK: LKM Recycling Ordered New Shredder from Austria

The RS150, manufactured by Austrian-based Untha, is the company's largest four shaft shredder. It has been installed at British waste management firm LKM Recycling, headquartered in Sittingbourne, Kent.

According to the information, the shredder has been procured to maximize materials recovery and revenue generation at this increasingly diverse recycling specialist. Over 40 years ago, LKM started out as a scrap metal business but fast forward to 2017 and the 55-strong company is now handling everything from metals and glass, to wood, plastic and general waste.

The robust 22 tons machine will therefore enable LKM to process an array of complex and often heavy duty applications including aluminum, tires and uPVC windows. Set to achieve throughputs of up to 12 tons per hour, the RS150 and its quick-change screens will achieve flexible homogenous particle sizing as small as 30 millimeters, depending on customer requirements. It is also



The RS150 is Untha's largest four shaft shredder

Photo: Untha

expected that LKM's annual recycling volumes will increase by up to 25 percent in line with the team's ability to

now profitably process a wider range of materials.

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

## Oman: Two New Mixed Waste Recycling Systems

In the course of this year, two mixed waste processing facilities will start up in Oman.

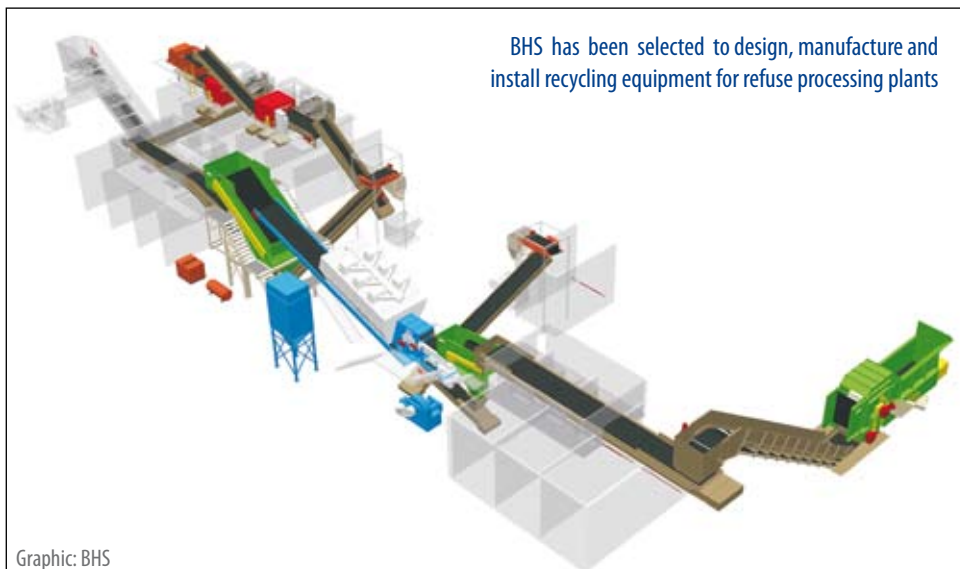
The 220 tons per day (Ibri) and 150 tons per day (Buraimi) systems will treat municipal solid waste from the governorates of Al Dhahirah and Al Buraimi in northwest Oman.

As reported, in 2016 French company Veolia and Oman-based partner Al

Ramooz were awarded a seven-year waste management contract tendered by Oman Environmental Services Holding Company (Be'ah). The contract includes the collection, transportation and landfilling for 250,000 residents. To fulfill this contract, Al Ramooz National LLC takes charge of

collection, material processing and recovery. To maximize recovery and product quality, the Oman-based company has selected the patented MSW process of US-based recycling equipment producer Bulk Handling Systems (BHS), combining screen, air and optical separation technologies to capture recyclable commodities and to produce fuel.

BHS has been selected to design, manufacture and install recycling equipment for refuse processing plants



Graphic: BHS

According to the provider, the systems will feature the BHS Metering Bin Liberator Class to open bags and provide the system a steady flow of material. BHS Tri-Disc screens extract organics and separate containers from fiber while Nihot Single Drum Separators segregate dry recyclables from bulkier items, such as wood and rock. NRT's In-Flight Sorting optical technology targets PET, HDPE, PP and PVC. Cardboard, mixed paper, ferrous metals and aluminum are also recovered.

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





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## Efficient, Sustainable and Quiet

Following a thorough selection process, Hans-Peter Kremer, technical developer at Swiss Thommen AG is sure that he made the right choice with the fully-automatic channel baling press HSM VK 12018 R FU.

With eleven sites, Thommen AG is one of the leading recycling companies in Switzerland. The subsidiary Halter Rohstoff AG in Biel collects and compresses pre-pressed cardboard (B19) and loose plastic sheets. Annual volume: 25,000 tons. After 20 years, one large-format baling press was a source of growing concern at Halter Rohstoff AG. The cost of maintenance and replacement parts increased significantly, reported Hans-Peter Kremer, so it was time to look around for a new baling press for the site in Biel.

### Convincing reference customers

Important criteria in the selection were machine robustness (statics, wear), industrial safety, energy consumption, write consumption, noise level and maintenance effort – in addition to technical competence of the future supplier and, of course, the price. Following an intensive pre-selection process, technical developer Hans-Peter Kremer still had two providers on the short list and planned reference visits. The first hurdles already appeared at this early stage, he said. One provider only offered references that were located far away, the second reference no longer wanted their machine and offered to sell it to Kremer during the reference visit. "It wasn't exactly ideal", recalls Hans-Peter Kremer today.

Mr. Kremer then made contact with HSM after reading about the company in an article in a recycling trade journal. He was "very impressed" by a visit to the company's plant in Salem, Lake Constance, and saw how high the share of in-house production is at HSM. "Made in Germany" is very important to the recycler and, especially, to his boss Dr. Tobias Thommen. Also, after having made several reference visits to HSM customers in south Germany, Mr. Kremer returned satisfied to the Thommen headquarters in Kaiseraugst near Basel. Among others, he went to a company which has been pressing the entire range of materials in constant alteration with a large-format channel baling press from HSM for seven years without complaint. "I saw how well the machine works under high stress during everyday operation". And, during the visits, he was also able to "debunk some sales talks".

### "HSM stands by their product"

Thommen AG did not hesitate in making clear demands on the new machine supplier. It was agreed that the machine would be returned and penalty payments would be due if product promises (throughput, bale weight, electricity consumption, etc.) were not kept. Only HSM was willing

to make these promises in writing. Thus, it was clear to Hans-Peter Kremer "that HSM stands by its product and behind the advertised achievements".

It was precisely these product characteristics, which allowed Thommen AG to finally order the VK 12018 R FU (120-ton pressing force, 180-centimeter filling opening length). It is a long-lasting, robust and efficient system, says Hans-Peter Kremer. The HSM press has low operating costs (electricity, wire) and it runs quietly. In addition, it complies with all current regulations on occupational safety. All this leads to a "very good price-performance ratio".

### Savings in wire and electricity costs

At Halter Rohstoff AG, the bales were previously strapped vertically with five wires, and today only with four wires using the same wire strength, saving 20 percent. For certain materials, a fifth wire can be easily and quickly connected.

The Swiss operators also opted for a stepless frequency-controlled drive of the HSM VK 12018. In combination with the HSM pump concept, this leads to a significant energy saving of around 50,000 kilowatt hours/year – in continuous operation compared to the old uncontrolled drive. With this combination, only the HSM machine already reaches the energy efficiency class IE 4, says Kremer – even though IE 3 will only become a legal requirement in 2017. Hans-Peter Kremer: "The HSM press is almost a full step ahead of the legislation." At Thommen, it is expected that the electricity savings of one machine over 20 years will amount to one third of the purchase price of a new press.

He likes the fact that the HSM product is consistently geared to a long service life. The stress-free, cardanic suspension of the press cylinder, for example, prevents stresses and tilting, so no expensive cylinder replacement



Hans-Peter Kremer: "According to our thorough market observation, we see that the machine from HSM is unbeatable in terms of robustness, efficiency and reliability"

Photo: HSM



is expected. Additional wear plates made of high-strength XAR500 steel make it possible to exchange only these plates, but Hans-Peter Kremer is not expecting that: "With our material, the sheets last 30 years". However, he finds it good that Halter Rohstoff is equipped with this machine for stronger wear – should any other materials be pressed in Biel at some point.

There is also an advantage in the logistics: Since the new bales are about 150 kilograms heavier than the old bales with the same bale volume, the trucks can be loaded faster. Kremer said: "This reduces warehouse volumes, loading time and overall handling costs". The collaboration with HSM in the project phase right up to acceptance is described by the Swiss

recycling company as "professional and passionate". HSM is fully committed with engaged and creative and is also creative. For example, HSM suggested that the customer in Switzerland to alter the machine's location in the hall when changing to the HSM VK 12018, resulting in more space.

➔ [www.hsm.eu](http://www.hsm.eu)

## Shredding Technology Helps to Solve Waste Problem

**An increased amount of waste forced Jeju City, the capital of Jeju Province in South Korea, to rethink their current situation.**

The city has grown quite rapidly since the 1970s and has a population of over 600,000. Every year, Jeju welcomes more than 14 million visitors from mainland Korea, Japan and China. However, with the expanding population and the growing number of tourists, the input stream has increased from 150 to 350 tons per day. That is why the city decided to make 200 tons per day of solid recovered fuel (SRF) to supply the SRF consumers.

Metso's pre-shredder M&J 4000S was chosen to do the job and has helped to solve the municipality's problem, shredding more than 400 tons of mu-



M&J PreShred tackles most forms of waste

nicipal solid waste per day. According to the customer, ACI Chemicals Asia

Inc, the machine has surpassed the expectations. As is emphasized by the provider, M&J shredding technology is "based on extremely aggressive knife designs and open cutting tables. These distinct technical advantages ensure our shredders provide outstanding performance when dealing with mixed and challenging materials". These key features would make the stationary M&J PreShred 4000 extremely resistant to wear caused by materials and waste normally considered as nonshreddable, including solid steel, reinforced concrete and rocks.

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

## USA: Aqua Metals Has a First Licencee for its Battery Recycling Technology

Irish-based international concern Johnson Controls International plc (JCI), one of the biggest providers of automotive batteries, has finalized an agreement covering North America, China and Europe for a cutting-edge electrochemical battery recycling technology. Under terms of a multi-faceted deal, the concern is investing in Aqua Metals.

According to Dr. Stephen Clarke, chairman and CEO of the company, the partnership with Johnson Controls "is a tremendous step forward and is an opportunity for us to work with the global leader in automotive battery manufacturing and responsible recycling".

Under the agreement Johnson Controls will become the first licensee for AquaRefining technology, supply Aqua Metals with batteries to recycle as a service as part of the Johnson Controls closed-loop network, purchase AquaRefined metals produced from Aqua Metals' facilities and acquire just under 5 percent of the company's outstanding shares. Aqua Metals, which recently opened its first plant in McCarran, Nevada, uses an electrochemical process for recycling batteries. As reported, the company recycles lead with its patent-pending AquaRefining technology. "Unlike smelting, AquaRefining is a room temperature, water-based process that is fundamentally non-polluting. These modular systems allow the lead-acid battery industry to simultaneously improve environmental impact and scale production to meet rapidly growing demand," Aqua Metals underlined.

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



Photo: Marc Weigert



## Australian Company Ordered Robotic Waste Sorting System

Finnish-based ZenRobotics Ltd. will deliver a robotic waste sorting system to Sunshine Groupe in Melbourne, Australia. The three-armed ZenRobotics Recycler unit (ZRR3) will be the first of its kind in Australia and it is expected to be fully operational in spring 2017, the provider emphasized.

Sunshine Groupe, founded in 1926, is a family-owned business with recycling experience in five generations. With recent investments Sunshine Groupe aims to position itself as one of Melbourne's primary waste processors. Through a partnership with Sustainability Victoria, the company installed a material recovery facility (MRF) at their Brooklyn landfill and recovery site which allows it to better identify resources from the 120,000 tons per annum waste stream to be repurposed and reused for other materials. A mixture of waste materials will be dropped off at the primary transfer station where it will then be processed to sort the materials into specific fractions.



Photo: ZenRobotics

After the waste has been sorted through these processes, the materials will be transferred to the state-of-the-art robotic material sorting plant. Here, the ZRR3 – a tri-station robotic gantry arm plant manufactured by ZenRobotics and supplied by the provider's dealer Robots in Waste – will use its sensors and Arti-

ficial Intelligence (AI) to sort material types from the waste stream. "The ZRR3 can sort around 6,000 objects from the belt per hour, equating to a plant total of approximately 7 to 8 tons per hour", Sunshine Groupe estimates. The combination of the MRF and the robotics material sort-

ing plant is expected to recover approximately 50 percent of the entire waste stream – around 60,000 tons per annum. Over the first year, recovery rates are expected to increase between 70 and 80 percent.

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

## Patent-Pending Separator Technology

Best Process Solutions, Inc. (BPS), a sales, engineering and manufacturing company headquartered in the US, has introduced its new RecoverMax Fines Process.

According to the information, it is able to recover any piece of metal greater than one millimeter. "The heart of the

system is the worldwide patent-pending RecoverMax Separator, which separates any piece of metal from

glass and rock at a purity of over 98 percent," the Ohio-based firm underlined. Once the metals are recovered, the system would complete the final step to produce a 0 to 3 millimeter copper/precious metals fraction and a 3 to 12 millimeter copper fraction (purity: 95 percent), both to be sold as a refinery-grade product. The 3 to 12 millimeter Zorba fraction with 10 to 15 percent copper would then be marketed as a high grade Zorba product. The systems can be configured to meet the needs of customers ranging from 2 to 20 tons per hour plants, the provider emphasized.

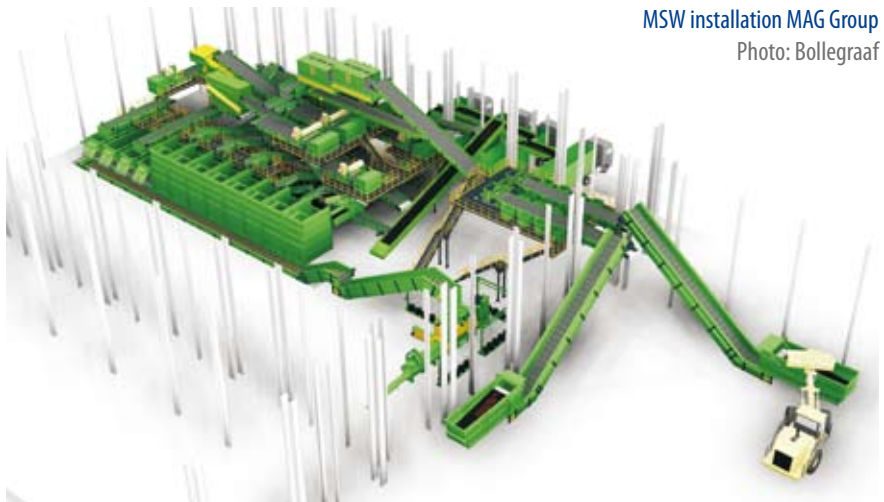


➔ [www.bpsvibes.com](http://www.bpsvibes.com)

## Bollegraaf to Build Recycling Facility in Russia

Russian company MAG Group in Nizhny Novgorod – one of the largest expert companies in the field of collection, removal and recycling of municipal solid waste and bulky waste in the Russian Federation – has ordered a mega Municipal Solid Waste (MSW) Recycling Facility to process the equivalent of 60 tons per hour.

According to the Dutch company Bollegraaf, it is delighted to have been chosen as the leader in developing turnkey sorting systems for the design, manufacturing and installation of what is going to be one of the most advanced Municipal Solid Waste (MSW) Recycling Facilities in Russia. As reported, the installation developed for MAG Group will be well suited with the latest and most advanced technologies. The objectives: The MAG Group is expecting failure-free operation of the equipment since the Waste Sorting Complex is designed for around-the-clock operation. Also the beneficial effect on the environment in the region, due to high-quality and efficient extraction of the maximum quantity of useful fractions from waste, plays a major role in the project. The installation will be equipped with several innovative technologies



MSW installation MAG Group  
Photo: Bollegraaf

of Bollegraaf including the Elliptical Separator, which is a state-of-the-art ballistic sorting machine, to separate 3D fractions from the 2D fractions and the fines fraction. The installation will also feature the patented Bollegraaf 'anti-wrapping' starscreen. The large

cardboard is separated from the material flow by the Bollegraaf OCC (old corrugated cardboard) screen. Paper, small cardboard, and small material will be screened off.

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

Upcoming ICM Events			<a href="http://www.icm.ch">www.icm.ch</a>
ICBR 2017			<b>22<sup>nd</sup> International Congress for Battery Recycling ICBR 2017</b> September 20 – 22, 2017 Lisbon, Portugal
WRF 2017			<b>Electronics &amp; Cars Recycling WRF 2017</b> November 14 – 17, 2017, Macau, China Conference, exhibition and plant tours organized by World Recycling Forum
IERC 2018			<b>17<sup>th</sup> International Electronics Recycling Congress IERC 2018</b> January 16 – 19, 2018 Salzburg, Austria

ICM AG, Switzerland, [www.icm.ch](http://www.icm.ch), [info@icm.ch](mailto:info@icm.ch), +41 62 785 10 00

## 3rd GCC Waste Management & Recycling Forum

May 9 – 10, 2017, Dubai (United Arab Emirates)

Following on to the success of the last two editions of GCC Waste Management & Recycling Forum, the organizers of Immensoft Business Intelligence (IMNBI) have continued to support this event, under the theme of Innovative Solutions for Sustainable Waste Management through Science and Technology.

The conference provides a forum for the exchange of scientific information and work on the current situation of waste management in GCC amongst professionals, researchers, government departments and local authori-

ties, the organizers emphasize. "Waste Management is one of the key problems of modern society due to the ever-expanding volume and complexity of discarded domestic and industrial waste. Society is increasingly aware of the need to establish better practices and safer solutions for waste disposal."

This situation requires further investigation into disposal methods and recycling as well as new technologies to monitor landfills, industrial mining wastes and chemical and nuclear repositories. It creates also a need for

more research on current disposal methods such as landfills, incineration, chemical and effluent treatment, as well as recycling, clean technologies, waste monitoring, public and corporate awareness, and general education. "Unfortunately, many of the policies adopted in the past were aimed at short term solutions without due regard to the long term implications on health and the environment, leading in many cases to the need to take difficult and expensive remedial action," IMNBI states.

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

## Trade Show Recycling-Technik

May 10 – 11, 2017, Dortmund (Germany)

On 10th and 11th May, the fourth Recycling-Technik will take place in Dortmund. The expert trade show is considered an important business and innovation platform for recycling and environmental technology, as well as for urban mining. Again this year, everything will be focused on technology for the sector. Exhibitors will present machinery and plant components for reclamation and

environmentally-sound disposal. Furthermore, at its community stand the WFZruhr – a corporate network for the environmental industry in North Rhine-Westphalia – will give regional startups the opportunity to present themselves. According to the organizer, the trade show enjoys increasing popularity. Visitors can find out about the growing diversity of industry solutions available both at home

and abroad. Easyfairs has received numerous exhibitor bookings and expects 15 percent more than at the previous event. With lectures, guided tours and the first International Cooperation Exchange, visitors will find a wide range of additional offers in their search for new products and solutions.

➔ [www.recycling-technik.com](http://www.recycling-technik.com)

## International Congress for Battery Recycling

September 20 – 22, 2017, Lisbon (Portugal)

The 22nd ICBR, organized by Swiss company ICM AG, is classified as the international platform for discussions of the latest developments and the challenges of battery recycling, bringing together many decision makers in the battery recycling chain such as battery producers, recyclers, collection schemes, policy-makers and transport companies. Accord-

ing to the organizers, more than 200 international experts from industry, authorities and academia will discuss and present the following topics: Safety aspects with lithium primary and lithium rechargeable batteries, Battery technologies development, Urban mobility: The gate to e-mobility?, Update of the review of the Batteries Directive 2006/66/EC, Energy storage: Opportunities for a second use of batteries?, Energy storage and e-mobility: Complementary technologies?, Economic aspects of collection or take back schemes, New trends in battery recycling technologies: primary and rechargeable, Eco-design: A critical approach to batteries removability?, International developments in batteries collection and recycling, Safety aspects in the end of life value chain.

An exhibition area is integrated into the congress facility, where vendors meet their clients. The congress is also organizing workshops about hot topics to the participants and a plant tour to the leading recycling company Ambigroup Reciclagem SA.

➔ [www.icm.ch](http://www.icm.ch)



Photo: pixabay



## Premiere: Matchmaking Recycling-Technology

May 11, 2017, Dortmund (Germany)

The aim of the ZENIT GmbH (Center for Innovation and Technology in NRW), the WFZruhr (Center for Economic Promotion Ruhr for Disposal Engineering and Utilization Technology) and of the Enterprise Europe Network is to encourage international co-operations of circular economy companies. Therefore, the fair Recycling-Technik, which takes place from 10 – 11 May in Dortmund, offers an international matchmaking for the very first time. According to the WFZruhr, a voluntary initiative of public and private circular economy companies, Enterprise Europe Network is a strong partner. This initiative of the European Commission has agencies in more than 60 countries and can

therefore be regarded as the world's largest network for information agencies and consulting centers for small and middle-sized companies (SME). According to the information provided, there are numerous international contacts and partners regarding recycling and company issues.

Interested companies can profit from this offer in seven steps:

1. Book your visit at the fair on May 11, 2017.
2. Specify your offer as well as demand regarding technology and products. Furthermore, make your ideas for research projects concrete.
3. Register online with a short and general information regarding your

company and concerning your concrete requests for co-operations.

4. Go through the catalogue of participants and choose your dialogue partner. Please note that new participants and profiles will be added till the end of April.
5. In the forefront, study your list of dialogue partners, which will be arranged by ZENIT.
6. Stop by the booth of the WFZruhr (hall 7, booth U33) and have a talk with potential partners on May 11, 2017.

Online registration and catalogue can be found at [www.b2match.eu/Recycling2017](http://www.b2match.eu/Recycling2017)

## Waste-to-Resources 2017

May 16 – 18, 2017, Hanover (Germany)

Since more than a decade, Waste-to-Resources one of world's leading conferences on MBT (mechanical biological treatment) and MRF (material recovery facilities). The previous conferences had participants from up to 41 countries each. Experts from 16 countries will present their practical experiences and new developments. Key aspects of the current program are as follows:

- waste management strategies, new waste treatment technologies
- utilization of plastic, mineral and organic waste
- anaerobic digestion of organic waste fractions
- practical experience, optimization and new developments
- reduction of emissions
- waste analytics, waste prognosis
- energy recovery by RDF power plants and cement kilns, liquefaction
- conditioning, use and sale of output fractions from mechanical and biological treatment
- new and upcoming legal regulations in the EU
- waste management in emerging nations

This year, the international conference will be held from the 16th to the 18th of May 2017. It is organized by Wasteconsult international and the association of German MBT operators (ASA). On the three conference days

there will be continuous simultaneous translation provided in session one. Hence, it will be possible to hear all those presentations in English, French and German.

Program and more information about conference, exhibition and accommodation are available at [www.waste-to-resources.eu](http://www.waste-to-resources.eu).



Photos: Wasteconsult international

## European Plastics Recyclers Annual Meeting

June 15 – 16, 2017, Barcelona (Spain)

Plastic recycling is an important element of the circular economy. This is why “the role of product design and marketing” will be in the center of attention during the conference which

takes place in Barcelona. This yearly event of plastics recyclers in Europe gathers around 200 attendees from across the whole plastics value chain: recyclers, collectors, sorting compa-

nies, converters, raw material producers, brand owners as well as academics and decision makers.

➔ [www.plasticsrecyclersam.org](http://www.plasticsrecyclersam.org)

## Plastics Recycling Technology 2017

June 20 – 21, 2017, Cologne (Germany)

Responding to the pressure to recycle more plastics and to add value to reclaimed materials, leading experts and professionals from across Europe gather in Cologne for the first Plastics Recycling Technology conference. The event, organized by consultancy Applied Market Information Ltd. (AMI), takes place on 20-21 June 2017.

According to AMI, in addition to a networking opportunity, Plastics Recycling Technology 2017 provides expert analysis and discussions regarding advances in plastics recycling



systems, from sorting and cleaning through to compounding and pelleting.

“Speakers also examine developments in additives for boosting the properties, appearance, compatibility and processability of recycled plastics and explore ways to improve the quality of reclaimed materials so that they can be used in higher value applications,” the organizer assures. The conference would provide the perfect forum to discover new ways to create a circular economy for plastics.

Full program and booking details are available at: ➔ [www.amiplastics.com/events/event?Code=C806](http://www.amiplastics.com/events/event?Code=C806)

Photo: O. Kurth

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# **Waste-to-Resources 2017**

## **7<sup>th</sup> International Symposium MBT, MRF, Recycling**

**Resources and energy from MSW and organic waste**

**Conference & Exhibition**

**16<sup>th</sup> – 18<sup>th</sup> of May 2017 in Hanover, Germany**  
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- **Utilisation of plastic, mineral and organic waste**
- **Anaerobic digestion of organic waste fractions**
- **Practical experience, optimisation and new developments**
- **Reduction of emissions, waste analytics, waste prognosis**
- **Energy recovery by RDF power plants, liquefaction and cement kilns**
- **Conditioning, use and sale of MBT & MRF output fractions**
- **New and upcoming legal regulations in the EU**
- **Waste management in emerging nations**

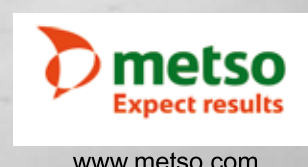
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