

2/2017  
3. Volume  
24,- EURO

# GLOBAL RECYCLING

*The Magazine for  
Business Opportunities  
& International Markets*



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the Circular Economy  
Become Reality, Page 4***

**Canada's Waste Management Policy, Page 16**

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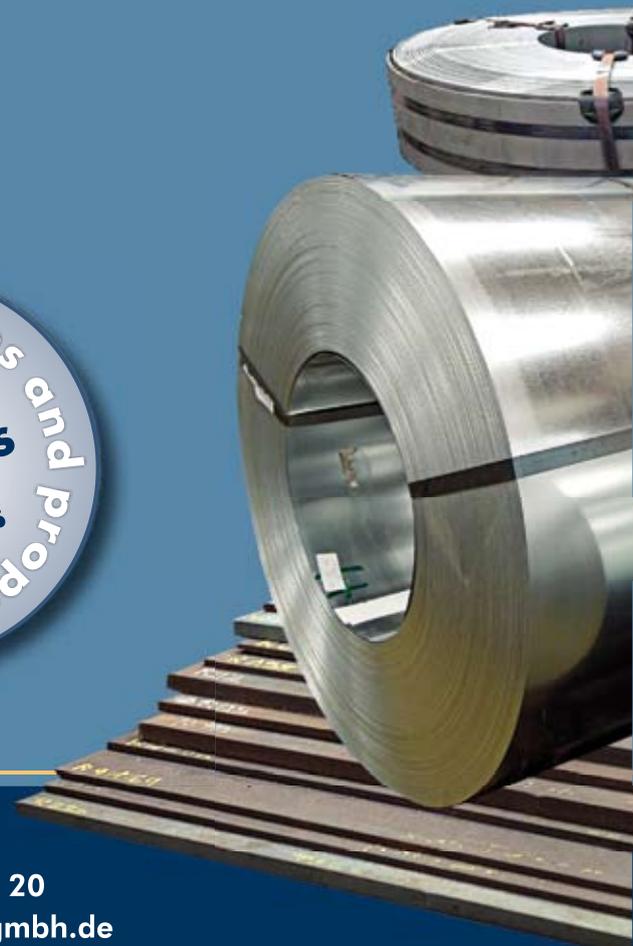
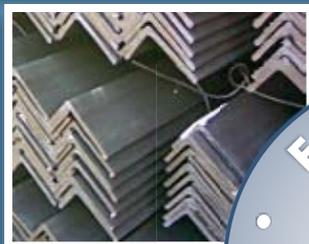
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**The Magazine for Business Opportunities**  
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ISSN-Print 2365-7928  
 ISSN-Internet 2365-7936

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MSV Mediaservice & Verlag GmbH  
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Advertisement Price List No. 3  
 currently valid.

**Publishing house:**

MSV Mediaservice & Verlag GmbH  
 Münchner Str. 48, 82239 Alling/Biburg  
 GERMANY  
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 Fax: +49 (0) 81 41 / 53 00 21  
 E-Mail: msvgmbh@t-online.de

www.eu-recycling.com  
 www.global-recycling.info  
 www.recyclingportal.eu

**Publication Frequency:**

The magazine appears four times a year. If the magazine cannot appear due to force majeure, such as a strike, this shall not give rise to any claims against the publishing house. Attributed contributions do not necessarily represent the opinion of the editors. For unsolicited sent-in manuscripts and photo material the publishing house does not assume any liability. No part of this publication may be reproduced, included in online services and the Internet or transmitted by any means without written permission of the MSV GmbH. All information have been compiled with the greatest care, however, no responsibility is taken for the correctness.

**Printers:**

StieberDruck,  
 97922 Lauda-K.

**Next Issue at**  
**7. Oct. 2017**



## Recycling Is Gaining Significance!

According to a new report published by the Canadian Plastics Industry Association (CPIA), 322 million kilograms of post-consumer plastic packaging were collected in Canada for recycling in 2015. The plastic quantities represented a net increase of 1.3 million kilograms compared to 2014. "While the net increase is good news, Canadian plastics recyclers want more supply," CPIA gave account. "They have underutilized capacity creating ample opportunity for consumers and businesses to supply our recyclers with more plastics."



However, Canada's neighboring country – the United States of America – is a major exporter of scrap materials. Some weeks ago, the Washington-headquartered Institute of Scrap Recycling Industries (ISRI) has released new, independent data highlighting the important role scrap commodities play in U.S. exports: According to the study, U.S. scrap exports generate more than 28 billion US-Dollar in total economic activity. As reported, the data show that approximately 26.36 percent of the scrap materials processed in the United States is exported to other countries for manufacture into new products. These exports would help create jobs in the United States and also reduce worldwide energy demand and the need to mine and harvest virgin materials. "In 2017, more than 40,000 jobs are supported by the export activities associated with the processing and brokerage operations of scrap recyclers operating in the United States," ISRI pointed out. These jobs would pay an average wage of 75,934 US-Dollar. An additional 93,772 jobs are provided by supplier operations and through the indirect effects of scrap recycling exports. More than 3 billion US-Dollar in federal, state, and local tax revenue would be collected as a result of scrap exports.

In the USA there are also private initiatives to boost recycling. The investment firm Closed Loop Partners puts money into sustainable consumer goods, advanced recycling technologies and development of the circular economy. Its investors include international operating companies like Colgate-Palmolive, Goldman Sachs, Johnson & Johnson, Nestlé Waters, Pepsico, P&G and 3M – to name but a few.

But there is still room to improve recycling activities. The situation in Canada is described from page 16 onwards. In Malaysia the population growth has led to an increase in generation of solid waste and has become an issue for the government to be solved (page 19). In view of the immense value of food lost or wasted annually at the global level (estimated at 1 trillion US-Dollar by the Food and Agriculture Organization of the United Nations), investing in food waste treatment would pay off (page 28). The same goes for wastewater treatment: In Tunisia, where the water reserves are limited, the demand for appropriate technology is rising (page 24).

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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## Canada: Investors Are Welcome

In Canada, there will be a new investment hub soon.

In December last year, the Government of Canada informed that the country will dedicate 218 million Dollar over the next five years to increase investments that will create jobs and growth for the middle class. This unprecedented funding would support the creation of a new investment promotion agency, Chrystia Freeland, Minister of International Trade, was quoted.

As reported, the new investment hub would be operational in 2017, with the goal of attracting new international investments while making it simple and more attractive to invest in Canada. It would build on Canada's strengths and optimize the existing contributions of governments and the private sector.

### Canada's big cities applaud

The Consider Canada City Alliance (CCCA) welcomes the opportunity to help shape a new Federal Invest in Canada Hub focused on international investment attraction. The thirteen members of the alliance include the city regions of Halifax, Quebec City, Montreal, Ottawa, Toronto, Waterloo, London, Winnipeg, Saskatoon, Calgary, Edmonton and Vancouver; the newest member is Hamilton. The economic zones of the former twelve members of the CCCA represented 57.3 percent of Canada's population, produced 63.4 percent of its GDP (gross domestic product) and accounted for 82.5 percent of Canada's GDP growth in the five years until the

third quarter 2016. As reported, the Canadian cities – and their Economic Development Organizations (EDOs) – help international companies determine the best strategies for business expansion and continually improve Canada's ability to attract new investment and trade opportunities. The organization's goal is to integrate the resources at municipal and federal levels to provide one-stop service to foreign investors. To achieve this, the CCCA had held direct discussions with the Ministries of International Trade, Innovation Science and Economic Development, and KPMG, the research and accountancy firm leading stakeholder consultation, the alliance reported in March this year.

### Infrastructure is becoming a big focus

According to Mentor Works Ltd., a company with expertise in Canadian government funding, infrastructure is becoming a big focus in Canada. To fuel the country's economic growth, the Canadian federal government would increase spending to employ more Canadians and achieve improved transit, energy, and other types of infrastructure. Tenders in regard to waste collection, recycling, wastewater and other environmental services can be found at [www.merx.com](http://www.merx.com).

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- ➔ [www.considercanada.com](http://www.considercanada.com)
- ➔ [www.mentorworks.ca](http://www.mentorworks.ca)

### Invest in Canada

There are many opportunities in Canada. The country has for instance made significant investments to create the right environment for foreign investment in the renewable energy market. These include the creation of key R&D partnerships in the sector, such as the Clean Energy Fund, which is targeted to promote partnerships between public, private and academic organizations to develop new technologies that reduce greenhouse gas and other emissions. Another sustainable technology sector is the bioproduct business. In developing products such as bio-based materials and composites, cellulosic ethanol commercialization, platform chemicals and intermediates, fermentation technologies and pyrolysis technologies, Canada's network of universities and research institutions "is connecting leading-edge research with foreign investors around the world", the publication "Invest in Canada", 2016-2017 edition, pointed out. "Further, with well-established forest products and agri-processing sectors across the country, Canada has the abundant diversity of biomass feedstock to supply foreign investors looking to establish bioproducts processing facilities".

## Double Reason to Celebrate

The first Global Recycling Day will take place on March 18, 2018, the Bureau of International Recycling (BIR) announced during the BIR World Recycling Convention & Exhibition in Hong Kong. According to the information, this day also marks the 70th anniversary of this international association. "I am delighted to be announcing this very important date. We want to use this day to promote action on recycling around the world," Ranjit Baxi,

President of the Bureau of International Recycling world body, is quoted. "Our members, who rank amongst the most prestigious recycling companies in the industry, want to take ownership of this powerful initiative. We were the first global trade body to be created and therefore our 70th anniversary is a fitting date for such an important event. We want people to think 'resource', not 'waste'. There are 7 billion people on this earth, and if

we can just get 10 percent of these people to make one positive recycling change on Global Recycling Day, it will have a massive impact."

During the course of 2017, BIR will be announcing a number of initiatives to mark Global Recycling Day. These will include global partnerships and calls for action.

- ➔ [www.bir.org](http://www.bir.org)

# How Start-Ups Can Make the Circular Economy Become Reality



As raw materials are scarce worldwide and are becoming increasingly expensive, companies that save resources or produce gently do not only contribute to a cleaner environment but actually have a real competitive advantage. The European Commission, which is currently working on the EU Circular Economy Action Plan, estimates that waste prevention, eco-design, reuse and similar measures could save companies within the EU between 250 and 465 billion Euro annually in raw material costs.

Currently, many European countries are still struggling to reach EU targets or to fulfill the latest standards in waste management. The calling gets louder, but so far, action seems to be missing. Hopefully not much longer, as a new generation of people, often called millennials, digital natives, Generation X or simply “founders” have committed themselves to the problem. They have realized the issues and have started embedding circular economy deep into their business models, according to Miriam Kehl, Advisor to the Board of Landbell AG and Associate Director at the Green Alley Investment GmbH.

## Circular Economy – more than just recycling

It is not enough to think about recycling. What we need are new business models around sharing, repairing, reusing and remanufacturing in all sectors of our economy: e.g. (e-)commerce, fashion, energy and even in the building sector. The good news is: these ideas exist already. However, many of the start-ups that are tackling environmental issues need assistance and guidance to enter the market or scale their products and solutions. What drives

them is the belief, that they can change something. And that is why we founded the Green Alley Investment GmbH. During the past years, we have seen over 800 business approaches. The continuously growing amount of applications and its diversity of topics are proof that we are on the right path transitioning towards a circular economy. As the area is huge, there is enough potential to be creative and to change something.

One of the areas that this new generation sees as a major environmental problem is packaging, due to the massive increase of e-commerce all over the world. By weight, packaging is responsible for over 3 percent of all waste generated in the European Union. It actually includes all sorts of materials: cardboard, glass, plastic, wood and metal – while cardboard is the most used one. Even though the EU has managed to recycle 65 percent of packaging in 2013, there is still room for more. The Finnish start-up RePack, winner of the Green Alley Award 2014, has made it its mission to reduce packaging in the fast-growing e-commerce business. The team around Jonne Hellgren has developed a new type of shipping bag made out of fully

recyclable materials, which can be taken back via a multi-path system and used several times by the customer. This is possible through a pledge, which returns to the customer in form of vouchers for cooperating online shops.

Green City Solutions, winner of the Green Alley Award 2016, is realizing innovations based on the concept of "Smart City", which means combating and eliminating problems like high emissions, high energy cost and air pollution through new and smart technologies. Increasingly, cities have to take measures against air pollution, like driving bans and creation of parks. Green City Solutions has now come forward with a new idea: a detached wall covered with mosses on both sides. These mosses swallow fine dust and convert it into biomass. The wall under the name "City Tree" absorbs 240 tons of CO<sub>2</sub>, equivalent to almost 300 trees.

Another area that urgently needs some great circular economy solutions is the building industry. It creates some of the biggest amounts of non-recyclable and toxic waste. It starts with the plasterboards made out of gypsum that is usually used for the separation of rooms in each house. When these boards reach landfills – and it does so in vast quantities as it constitutes about 15 percent of all construction and demolition debris – it can leach these toxic chemicals into our groundwater. And in the anaerobic conditions of landfills, bacteria convert gypsum into hydrogen sulfide, a poisonous gas. Adaptavate, winner of the Green Alley Award 2015, has been working on a solution to not use these toxic plasterboards in the first place. The



Photo: Green Alley

British start-up has developed a 100 percent recyclable wall called "Breathaboard", which is made from agricultural waste and is a sustainable alternative to conventional wall claddings made of gypsum.

### Good ideas need strong partners

Looking at all three start-ups above, they have great ideas to contribute to building up a circular economy. And yes, good ideas make a good start. However, introducing new products and technology to the market without any experience can be a hard challenge for young founders. Therefore, it is not only the financial assistance they need, but a partner, who points out obstacles at an early stage and brings in many years of expertise. RePack, Green City Solutions and Adaptavate all have one thing in common: They need to work on their business models and make their

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## The Circular Economy as Opportunity for Entrepreneurs

As a strict EU waste package is being negotiated in Brussels, Green Alley is looking for solutions which can implement the potential provisions. For the fourth time, green start-ups and young entrepreneurs can apply for the Green Alley Award, Europe's founder's prize for the circular economy. The organizers are looking not only for business models relating to resource conservation, the circular economy and recycling, but also for innovations in handling chemicals. This year, the award will focus on Ireland in addition to Germany, the UK, and Finland. Start-ups can submit applications at [www.green-alley-award.com](http://www.green-alley-award.com) until 25 July, 2017.

The Green Alley Award is given once a year to entrepreneurs and start-ups of the circular economy, organized by a network of partners in the Circular Economy and European entrepreneurial scene. Green Alley, the initiator, has been working with Seedmatch, Germany's crowdfunding pioneer, since 2014. Additional partners include the London accelerator Bethnal Green Ventures for technology driven start-ups in environmental and social areas as well as the European Recycling Platform (ERP) Finland, a recycling supplier for electrical and electronic equipment and batteries. This year's lead partners are H2 Compliance, a global REACH service provider offering full regulatory support as well as R2PI, a Horizon 2020 project.

### Valuable advice from industry experts

Six start-ups will be invited to the final round of the Green Alley Award 2017 in Berlin, where they will participate in individual workshops with experts and experienced start-ups from the circular economy and receive valuable feedback on their business models. At the end of the pitching event, an international jury of start-ups and experts will choose the winner of the Green Alley Award. The winner will receive a prize package worth up to 30,000 Euro, including a trip to Finland for the start-up event Slush.

idea scalable. For that, they need partners such as Green Alley.

Besides our yearly award, which showcases the best ideas in the Circular Economy, we connect start-ups with established companies and mentors across various industries. We believe that in order to successfully establish a Circular Economy, all sectors of our economy need to be engaged

and need to change their current way of doing business. If every start-up and company begins to implement the idea of a Circular Economy in its business model, the term "waste" will no longer exist as all resources are kept in circulation.

Find more information about the Green Alley Award at [www.green-alley-award.com](http://www.green-alley-award.com).

## Investing in Water Security = High Return on Investment

**With less than one year to go before the 8th World Water Forum takes place in Brasilia in March 2018, the World Water Council (WWC) calls on all governments to focus on water issues and prioritize water resources and management.**

"This is in accordance with the UN's Sustainable Development Goals to make water and sanitation for all a reality by 2030. Actions and investments are needed at the highest political level to deliver safe water and sanitation universally", the association stresses. According to the latest figures from the WHO/UNICEF Joint Monitoring Programme in 2015, 91 percent of the global population uses an improved drinking water source, up from 76 percent in 1990. "However, due to poor quality water and poor management, improved water sources do not equate to access to safe drinking water", WWC points out. "However, in Sub-Saharan Africa, a lot remains to be done, as approximately one-third of the population is still without improved access to drinking

water sources." As reported, the global progress achieved in access to sanitation lags far behind water, as the Millennium Development Goal (MDG) for sanitation failed to meet its target. By the time the MDG reached its deadline in 2015, it was estimated that 32 percent (2.4 billion) people globally still did not have access to improved sanitation facilities. Despite the global achievements in improved water sources, it is estimated that at least 25 percent of improved water sources are essentially unsafe due to various reasons, including, among others, the presence of fecal contaminants.

According to World Water Council President Benedito Braga, for every dollar invested in water and sanitation, there is an estimated 4.3 Dollar

return in the form of reduced health care costs for individuals and society worldwide. "And this does not take into account the benefits to global development, which enables countries and societies to progress economically, culturally and politically. For example, for every one billion Dollar invested in water and waste water, an estimated 28.500 jobs will be created", he is convinced.

Therefore, it is important to invest in infrastructure that improves water security and resilient management of resources for populations, for economies, and for the environment, WWC argues. Businesses were increasingly aware of the importance of investment in sustainable water resources management.

# Circular Economy Is a Window of Opportunity

According to a new report by Morgan Stanley's Sustainability Equity Research team, new technology and increasing climate-based legislation around the world is creating new business opportunities based on the circular economy.

As the New York based investment research firm stated, pioneering companies in a number of sectors were already shifting in that direction. "The advantages for companies are numerous and center on increasing the amount of value they create and retain," Jessica Alford, lead author of the report "The Shift to a Circular Economy", is cited. "The circular economy is unlikely to be a key fundamental value driver for many stocks at this stage, but we do think that the move to a more circular economy will be a disruptive trend in the next few years. Those companies that move first to innovate and adapt should be well placed."

Environmental concerns helped to spark this shift, the research team underlined. "The global economy, driven by the consumer frenzy to have the latest, fastest, best new model, now must contend with climate change, water scarcity and damage to the physical environment. A 'sharing economy' mentality has flourished, with people sharing car rides and renting out space in homes rather than paying for hotels. Legislation, particularly in Europe, but also in parts of Asia and certain states in the U.S., has also increased requirements to 'waste not, want not'".

Companies that embrace these trends can find new revenue streams and cut costs, the researchers are convinced. Minimizing waste reduces cost and changes in product design could make refurbishment and remanufacturing more viable. "Some are adopting entirely new business models which profit from extending the use of new products and then recycling the materials. This could give them a first-mover advantage over their competitors, especially if a more economizing consumer base continues to grow."

## Expanding the Customer Base

According to Morgan Stanley's Sustainability Equity Research team, extending the life of existing products

seems counterintuitive for businesses, but it does make sense. Remanufacturing and re-selling products could save on the cost of raw materials and expand market reach to include consumers unable to afford the latest new models of electronics like cell phones. "Remanufacturing retains much of the material and value included in the original product," Alford is quoted. "This saves costs for the manufacturer with the potential for higher profit margins and returns on capital. It also potentially creates new customer opportunities by making expensive products more affordable."

New innovations and technologies support the move toward a circular economy. In textiles, chemical processes are being developed to separate blended fibers and recycle the raw materials into new clothes. In the batteries market, economical recycling of lithium batteries is key as demand for hybrid and electric vehicles accelerates.

## Winners and Losers

The rise in a circular economy has macro implications because it boils down to using less finite resources, the researchers stressed. Having access to refurbished products would mean more spending power for the individual, which could boost the gross domestic product, according to a McKinsey study cited in the Morgan Stanley report. Importers of finite resources would also benefit.

As reported, the potential losers are the exporters of primary metals and other finite resources, and they tend to be developing rather than developed countries. "The net effect would largely depend on a country's ability to embrace new business models to offset any decline from primary raw materials."

Read more at [www.morganstanley.com/ideas/circular-economy-recycling](http://www.morganstanley.com/ideas/circular-economy-recycling)

Photo: Morgan Stanley



## In and Out: ISRI Unveils International Scrap Trade Database

The US-based Institute of Scrap Recycling Industries (ISRI) has launched a new International Scrap Trade Database providing information on international scrap trade flows. The data tables illustrate the trade of recyclables across the globe by major commodity and importing/exporting economies, and show the total amount of scrap traded globally. The initial offering of international scrap trade figures covers volume flows in metric tonnage from 2005 to 2015 for ferrous scrap, nonferrous scrap, plastic scrap and

recovered paper. "The scrap trade database is a one-stop shop that brings together for the first time statistics dedicated solely to the cross-border movement of scrap. This collection of information will prove valuable for traders, brokers, market analysts, government agencies, the press and all those interested in the global recycling industry," said Joe Pickard, chief economist for ISRI. "It also provides scrap processors and consumers insights to burgeoning markets and potential opportunities that can help

grow their businesses. The data will also prove beneficial to the public as it showcases the critical role recycling plays in the global economy and how scrap flows are deeply connected to developments in manufacturing. In addition, it demonstrates the importance of maintaining the free and fair trade of scrap around the world."

The International Scrap Trade Database can be visited under [www.isri.org/recycling-industry/international-scrap-trade-database](http://www.isri.org/recycling-industry/international-scrap-trade-database).

## USA: Paper Recovery Rate Reached 67.2 Percent in 2016

According to the American Forest & Paper Association (AF&PA), a record 67.2 percent of paper consumed in the U.S. was recovered for recycling in 2016. As reported, the annual paper recovery rate has doubled since 1990 and U.S. paper recovery has met or exceeded 63 percent for the past eight years. The industry has a goal to exceed 70 percent paper recovery for recycling by 2020 as part of its "Better Practices, Better Planet 2020" sustainability initiative. In 2016, consump-

tion of recovered paper at U.S. paper and paperboard mills held generally stable at 30.8 million tons – down just 0.1 percent compared with the 2015 level – while exports rose 1.3 percent to 21.8 million tons. There are also some domestic uses of recovered paper outside the paper industry, including base materials for insulation and molded pulp products. Data for the year 2016 indicate that 33.7 percent of the paper and paperboard recovered in the U.S. went to produce

containerboard (i.e., the material used for corrugated boxes) and 11.8 percent went to produce boxboard, which includes basestock for folding boxes and gypsum wallboard facings.

Net exports of recovered paper to China and other nations accounted for 40 percent of the paper collected for recycling in the U.S. in 2016.

[www.paperrecycles.org](http://www.paperrecycles.org)

## South Africa: PET Recycling Rate Increased

PETCO, the organization responsible for fulfilling the South African PET plastic industry's role of Extended Producer Responsibility, has announced their 2016 recycling figures which indicate an increase in their annual PET recycling rate from 52 percent of post-consumer bottles PET in 2015 to 55 percent in 2016. The organization

recycled 90,749 tons of post-consumer bottles in comparison to the previous year (74,360 tons in 2015) with the total PET market growing by 14.8 percent to 241,269 tons. The voluntary recycling fee paid annually by PETCO members on every ton of raw material purchased has enabled the payment of a total of 1.9 billion South African

Rand (about 142 million US-Dollar or 130 million Euro) by contracted recyclers to collectors for baled bottles since the inception of PETCO in 2004, ensuring the collection of PET bottles for recycling is sustained, and resulting in almost 800,000 tons of carbon and over 3 million m<sup>3</sup> of landfill space saved to date.

## Qatar Opened Tire Recycling Plant

Qatar's Modern Recycling Factory (MRF), based in Mesaieed Industrial City, came on stream in February. The development is part of Qatar's aim to develop sustainability and support green technology under its National Vision 2030 campaign. At 20,000 square meters, MRF is one of the larg-

est Greenfield recycling projects in the country. The plant, supplied by Danish equipment manufacturer Eldan Recycling, will process used tires and rubber products. The 41.3 million Dollar facility was financed and endorsed more than two years ago by Al Khalij Commercial Bank in support

of Qatar's green-technology business sector. According to media reports, Qatar imports some 900,000 tires annually. Due to the growing market, around 500,000 scrap tires pile up every year.

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

## Apple Intends to Use Only Recycled Materials for Products

One day, Apple's products could be manufactured entirely from recycled materials. The US-based concern released this aim in its Environmental Responsibility Report 2017, covering 2016. According to the information, the company is working on a "closed-loop supply chain" that would allow it to stop mining the earth for rare minerals and metals.

"To preserve precious resources, over 99 percent of the paper in our product packaging is from recycled or responsibly managed sources. And, in only two years, through partnerships with the Conservation Fund and World Wildlife Fund, we have achieved our goal of protecting or creating enough sustainably managed working forests to cover all of our product packaging needs", Apple stresses. "That's just a start. We're going deeper to pioneer a closed-loop supply chain, where products are made using only renewable resources or recycled material to reduce the need to mine materials from the earth. That means continuing to invest in ways to recover materials from our products – like Liam, our line of disassembly robots – and encouraging our customers to return products through Apple Renew, our recycling program. And we're launching projects and experiments that help us learn how to close loops. For example, we've melted down iPhone 6 aluminum enclosures recovered from Liam to make Mac mini computers for use in our factories, and we're transitioning to 100 percent recycled tin solder on the main logic board of iPhone 6s."

### Recycling Projects

For dismantling, Apple uses "Liam", a line of robots that can disassemble iPhone 6 and sort its components "with the goal of reducing the need to mine more resources from the earth". With two Liam lines running, the company can take apart up to 2.4 million



phones a year. "It's an experiment in recycling technology that's teaching us a lot, and we hope this kind of thinking will inspire others in our industry", Apple states.

For aluminum, the manufacturer found that one of the best sources of recycled material was the own products and processes. "This is because we specify such a high grade of the material – it's part of what makes our products so strong and durable. Today, the only way to keep aluminum at this level of quality is to keep a clean material stream – not to mix it with existing scrap aluminum, which is what typically happens at recycling facilities", the company emphasized. "Our challenge is to recover the aluminum from our products without degrading its quality". As reported, for tin, unlike aluminum, there is an existing market supply of recycled tin that meets the producer's quality standards. "So we are tapping into that supply for iPhone 6s and now using 100 percent

recycled tin for the solder on the main logic board, where the majority of tin in the device is found."

Goal is to recover as much tin as Apple is using. Because this heavy metal is not recovered by all electronics recyclers, the company is working to identify tin recyclers and ensure that the material is being consistently recovered and recycled from its products. "To start, we are sending iPhone 6 main logic boards recovered by Liam to a recycler who can reclaim the tin in addition to the copper and precious metals", the technology firm points out. "We are now looking for ways to do this on a larger scale for tin – and apply what we've learned to other materials. For example, we're experimenting with ways to recover cobalt from our lithium-ion batteries and use recycled cobalt."

➔ [https://images.apple.com/environment/pdf/Apple\\_Environmental\\_Responsibility\\_Report\\_2017.pdf](https://images.apple.com/environment/pdf/Apple_Environmental_Responsibility_Report_2017.pdf)

## Maine Woods Pellet Co. Chose ORC Technology Instead of Traditional Steam

Italian company supplied its largest biomass solution – a biomass ORC unit to produce 8 MWe – to the largest pellet manufacturer in Maine (USA). Turboden – a group company of Mitsubishi Heavy Industries (MHI) – has delivered an ORC system to Maine Woods Pellet, a leading pellet manufacturer based in Athens, Maine (USA). According to the information, the plant is successfully in operation since October 2016 and has already outperformed the expected power output, producing 9 MWe. Due to this solution, the customer utilizes wood waste from forestry operations (logging and sawmill residues) to generate electricity to be employed in its production process. As reported, the cogeneration plant uses a novel combination of both exhaust and condenser heat to pre-dry the feedstock for the existing pellet plant, making this the first biomass project to fully qualify for Massachusetts Standard Class 1 regulations for Renewable Energy Credits (REC's).

➔ [www.turboden.eu](http://www.turboden.eu)

## Converting Old Fibers into Composite Panels

Since spring this year the Netherlands-based paper manufacturer Van Houtum produces composite panels, made from recycled waste resources ranging from paper and agricultural waste, to textiles and even beverage cups as a raw material feedstock. As of 2018, the planned large scale production facility is scheduled to enter into operation – alongside the current paper mill.

For this purpose the company will invest several million Euro in a joint venture with US-based company Noble Environmental Technologies. According to media reports, the “Ecor” panels that will be manufactured by the joint venture with Noble Environmental Technologies are seen as an alternative to materials like MDF (medium density fiberboard) or chipboard, both in manufacturing process and chemical composition. As reported, the Ecor manufacturing process binds the cellulose fibers to each other, without the use of toxic glues and resins, using only water, heat and pressure. The panels produced in various thicknesses could be used for anything to make anything including wall and ceiling tiles, furniture, print and packaging. The raw material that will be used to make the panels will be sourced from regional enterprises and institutions, including the Amsterdam Schiphol Airport, recycling centers and manufacturing organizations. In a newspaper report it was stated that many companies regularly produce cellulose fiber waste and are looking for a circular economy solution to recycle and re-use this waste.

Ecor is a composite panel formed from the conversion of abundant

cellulose fiber, pressure, and heat. Fibers are sourced from old corrugated cardboard, old news print, office waste, forest waste, agricultural fiber, and even bovine process fiber. Ecor is 100 percent bio-based, 100 percent comprised of recycled waste materials, 100 percent recyclable, and is cradle-to-cradle compliant, Noble Environmental Technologies emphasized. According to the information, Ecor is available in a wide range of configurations from single and multiply panels to a versatile range of three-dimensional assemblies. The panels are also available in a variety of colors and with several treatments to enhance fire, acoustic, and moisture performance.

### Noble Environmental Technologies

The company, headquartered in San Diego (California), was founded in 2005 and developed Ecor in conjunction with the US Department of Agriculture. After almost a decade of product, process, equipment, and organizational development, the firm opened its first large-scale Ecor production facility in Serbia in 2014 with an annual production capacity of over 4,300,000 million square feet. And there are plans to expand annual



Photo: Ecor

production output to over 32,000,000 square feet. The planned expanded production capacity capitalizes on what the company has learned in operating the Serbia facility and as a result incorporates several cost saving and productivity enhancing features that result in shorter production cycle times, higher and more consistent quality, and substantially lower direct costs. Over the past few years, subsidiaries and affiliates in Serbia (Noble Environmental Serbia, NES), The Netherlands (Noble Environmental Benelux, NEBL), Turkey (Noble Environmental Turkey, NETR) were established. As reported, Noble Environmental Technologies is in discussions to open additional production facilities and R&D facilities in Europe, the United States and Mexico.

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

## USA: New Online Marketplace to Trade Recovered Paper

German-based technology provider Voith has joined forces with the Boston Consulting Group Digital Ventures – a subsidiary of the Boston Consulting Group – to establish a digital marketplace for paper industry. The joint venture has been named “merQbiz” after Mercury, the Roman god of trade. The new company has its headquarters in Manhattan Beach, California. The first product solution from merQbiz is a digital trading platform for recovered paper in the US, initially aimed at market participants of the North American paper industry. According to Voith, the North American recovered paper market has so far been characterized by strong fragmentation, with many different market participants, inconsistent supply and logistics chains, low levels of price transparency and fluctuating product qualities. The new online platform merQbiz is aiming to improve the way buyers and sellers of recovered paper do business. “Traders and buyers from pulp and paper mills, paper brokers and recycling companies can directly network with one another in the future and receive all the relevant information on supply and demand,” the provider assures. “They can also conduct their buying and selling transactions securely on the trading platform. Like many well-known online marketplaces, merQbiz can take over the evaluation of the sellers and buyers and the quality of the merchandise. This ensures enhanced transactional transparency, professional processing and a high level of security for all goods, logistics and payment flows.” For Voith, merQbiz is another major step in becoming one of the significant players of the digital industry. The technology group plans to invest about 50 million Euro in the setup of the venture by the end of fiscal 2020.

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

# USA: New Joint Venture to Commercialize Innovative Technologies

The new business – a joint venture of the investment company Wasson Enterprise and the company Innventure – employs a strategic value creation model to repeatedly create new businesses, including those from proprietary Procter & Gamble technologies. The original Innventure had created a plastics recycling company called PureCycle Technologies.

In April, Wasson Enterprise (WE), a Chicago-based angel investment group, founded by Gregory D. Wasson, and Innventure, co-founded by Michael Otworth to commercialize innovative technologies, announced the creation of “Innventure – a Wasson Enterprise Partnership”. According to the information, the new joint venture offers a blend of the two organizations’ collective experience and expertise as they work in partnership with Fortune 500 companies to evaluate, scale, and commercialize disruptive innovative technologies with significant market potential. Its initial partner is Procter & Gamble (P&G). The venture intends to explore similar relationships with other multinational businesses and institutions with a goal of building new, sustainable businesses and transforming markets. Wasson will serve as the chairman of the board;

Otworth will assume its leadership as chief executive officer.

## About Innventure

As reported, the Innventure team has more than 20 years of experience identifying disruptive technologies and creating new companies. Based on the operating model of its precursor company, XL Tech Group (XLTG), the Innventure team has experience with regard to identification of breakthrough technology solutions that address unmet needs that have suf-

ficient economic impact to drive and sustain changed customer behaviors. In total, of the 11 new companies created over 20 years, 10 achieved late-stage funding, including six successful IPOs (Initial Public Offering). Its primary technology sourcing partner is P&G, with PureCycle Technologies, a potentially transformative offering in plastics recycling, launched in 2015. This company’s process offers a recycled polypropylene with properties equal to virgin polymer. The proprietary process removes color, odor, and other contaminants – “resulting in 100 percent virgin-like polypropylene from recycled feedstock with potentially unlimited markets”, PureCycle Technologies points out.



- ➔ [www.innventure.com](http://www.innventure.com)
- ➔ [www.wassonenterprise.com](http://www.wassonenterprise.com)
- ➔ [www.purecycletech.com](http://www.purecycletech.com)

Photo: GR-Archive

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# The Plastic Bottle Recycling Market is Growing

Global Plastic Bottle Recycling Market Research Report – Forecast to 2022.

According to a market report, published by the Indian company Market Research Future, the global plastic bottle recycling market is growing rapidly owing to factors such as positive prospects for recycled products, and growing environmental concerns among others. “Currently North America is dominating the market of the recycling of plastic bottles,” the company pointed out. “The food and beverage industry leads the market in developed regions like the U.S. and helps to boost the market of bottle recycling. Additionally, recycled bottles are gaining popularity across the end user industries and the governments are also adopting new measures for recycling.” Report details are available at [www.marketresearchfuture.com/reports/plastic-bottle-recycling-market](http://www.marketresearchfuture.com/reports/plastic-bottle-recycling-market).

## Global Polyethylene Terephthalate (PET) Market

The global Polyethylene Terephthalate (PET) packaging market alone was valued at 50.5 billion US-Dollar (amounted to around 17.2 million tons) in 2015, US-based company



Photo: PRS PET-Recycling Schweiz

Research Nester Pvt Ltd stated in a report. The market trend is projected to reach 21.2 million tons making it worth 63.4 billion US-Dollar by 2021, expanding at a compound annual growth rate (CAGR) of 5.15 percent over the forecast period i.e. 2015-2021.

According to the information, with 31.3 percent share, Asia-Pacific dominated the global PET packaging market followed by North America with

23.1 percent and Western Europe with 19.6 percent in 2014. “On the back of factors like rising population, increase in urban cities across Asian countries and rising personal disposable income, Asia-pacific PET packaging market is envisioned to grow at a healthy rate in the near future,” Research Nester stated. Report details are available at [www.researchnester.com/reports/global-polyethylene-terephthalate-pet-market-analysis-opportunity-outlook-2021/131](http://www.researchnester.com/reports/global-polyethylene-terephthalate-pet-market-analysis-opportunity-outlook-2021/131).

## APK Intends to Build Plastic Recycling Plants in Asia and Europe

German-based company APK Aluminium und Kunststoffe AG plans to set up recycling plants by 2025 together with strategic partners in Europe and South-East Asia in order to strengthen plastics recycling.

According to a study by the Ellen MacArthur Foundation earlier this year, world-wide plastics production has reached more than 300 million tons per year and is still increasing. Roughly 78 million tons per year are consumed in single-use packaging, much of which ends up in incineration, landfills or in the oceans. Less than 17 percent of all plastic waste is currently recycled worldwide – this low number is due to a lack of efficient collection and sorting systems as well as a lack of advanced recycling technology in some regions. APK is convinced that the company has developed a breakthrough technology which can be applied to a broad va-

riety of plastic types and combinations commonly used in packaging, even difficult ones including multi-layer films. The technology exploits physical and chemical properties of different polymer types in order to separate these efficiently, resulting in high-purity single-polymer streams, the firm emphasized.

“In Germany we have developed an advanced and economically interesting recycling technology to recover virgin-quality polymers from plastic-packaging waste. We call it Newcycling,” CEO Klaus Wohnig explained. “We now want to expand in Europe while simultaneously bringing our

technology to the region where the problem is acute: South-East Asia. Of course, we are open to further co-operations with interested industry partners in order to change the plastics economy from linear to truly circular as soon as possible.” APK Aluminium und Kunststoffe AG was founded in 2008 and has expertise and patented technology in both mechanical and physical-chemical recycling of a variety of feedstocks. The company is owned by Munich based financial investors MIG Fonds and AT Newtec, an investment company of family office Struengmann.

[www.apk-ag.de](http://www.apk-ag.de)

## Europe: Project to Realize a Circular Economy for Flexible Packaging

A new project called “Ceflex” is organized by a consortium of European companies representing the entire value chain of flexible packaging.

The project mission is to make flexible packaging even more relevant to the circular economy by advancing better system design solutions which result from the collaboration of the companies represented in the consortium. As reported on the website of this project, the initiative continues the work of the recently concluded project “Face”, which helped to quantify the added value and identify opportunities to increase recycling of flexible packaging and “Reflex”, an “Innovate UK” funded technical project focused on recycling flexible packaging in the UK. The consortium currently has 34 stakeholders, represent-



ing all the major value chain players: raw materials suppliers, packaging converters, brand owners and retailers, producer responsibility organizations, collectors, sorters and recyclers, as well as other technology suppliers and end users of secondary raw ma-

terials. According to a “Ceflex” statement in April this year, the program will work towards the development of a collection, sorting and reprocessing infrastructure for post-consumer flexible packaging across Europe by 2025. “This will be enabled by the development and application of robust design guidelines for both flexible packaging and the end of cycle infrastructure to collect, sort and recycle it, due for completion by 2020.”

Interested companies which want to join the consortium or wish to learn more about the project, contact: [info@ceflex.eu](mailto:info@ceflex.eu) or go to [www.ceflex.eu](http://www.ceflex.eu).

Photo: Ceflex

## Pilot Project to Close Materials Cycle for Beverage Cartons

Komunala Novo mesto d.o.o. was the first municipal services company in Slovenia to take part in a pilot project to close the materials cycle for waste milk, juice and other beverage cartons (used beverage cartons or UBCs).

Through a series of specially designed activities, they were encouraging schools and households to collect UBCs separately and to pass as many of them on to recycling as possible. This was part of Novo Mesto’s efforts to gradually establish its own closed materials loop for waste beverage cartons, thereby securing enough raw materials to produce its own supply of sanitary paper over the long term.

Komunala Novo mesto provides municipal services for eight municipalities covering a total population of 65,000. According to the information, this population disposes enough waste milk and juice UBCs per year in yellow containers or bags to provide just enough resource of cellulose for the production of annual quantity of sanitary paper used by local public institutions – municipal government offices, schools, nursery schools, health centers, libraries and the like. “Around 45 hectares of woodland would have to be felled to make this quantity of sanitary paper; but if all UBCs in the area covered by Komunala Novo

mesto were recycled into sanitary paper, this would meet the entirety of local needs and, moreover, save around 1,100 trees and provide total independence from primary resources,” Italian paper company Lucart Group informed. “In a desire to lead the way in establishing this method of conserving the environment, Komunala Novo mesto has decided to take part in the pilot project.”

As reported, the key partners in these efforts to close the materials cycle for UBCs in Novo mesto are: Komunala Novo mesto (Slovenia), Dinos DROE Unirec waste packaging management company (Slovenia), Lucart Group (Italy), and Eko Inicijativa – community of businesses and institutions that practice sustainable professional facility hygiene were set up and coordinated by Valtex & Co. (Slovenia).



Photo: O. Kürth

## USA: Customs Grants Entry of Remanufactured Ink and Toner Cartridges

**Green Project Inc., a company specialized in recycling ink and toner cartridges, is pleased that U.S. Customs and Border Protection (CBP) has sided with the company in favor of its challenge to CBP's seizure of ink and toner cartridges last year.**

In letters dated February 21 and April 21, the Chief of CBP's Intellectual Property Branch said the Green Project cartridges in question had been "permissibly repaired" and should not be excluded from entry into the United States, the company with offices based in China, Europe and the United States reported. Maintaining that its imported cartridges were legitimately remanufactured, Green Project protested CBP's seizure of shipments, which occurred at California ports in November and December 2016. "Agents were acting on four general exclusion orders issued

by the U.S. International Trade Commission (ITC) in the 337-TA-565, 337-TA-691, 337-TA-723, and 337-TA-946 investigations," the international supplier gave account. "The orders limit the importation of certain third-party inkjet cartridges presumed to violate Epson and HP patents. To prove its remanufactured cartridges did not infringe, Green Project presented CBP with the identity of the retailer that first sold the OEM cartridges in the United States and then later collected the spent cartridges from its customers. Green Project also documented for the authorities how these cores

were gathered, shipped to China and remanufactured, and then returned to be marketed in the United States." After reviewing Green Project's claims, CBP held in favor of the firm. It found that the cartridges in question were "originally purchased within the United States" and that the processes used to remanufacture the cartridges fell "under permissible repair." As a result, the cartridges involved in the seizures would be outside of the ITC exclusion orders. The shipments were released to Green Project.

➔ <http://greenprojectinc.com>

## Australia: PVC Recycling in Hospitals

In Australia, currently an average of 15 tons of PVC medical waste are reprocessed per month and the PVC Recycling in Hospitals Program continues to expand to other states with collections starting in late 2016. The material is reprocessed in Australia and New Zealand, primarily used in new hoses for fire extinguishers, gardens and industry; and play as well as safety mats for children and workplaces.

According to the Vinyl Council of Australia, Australian hospitals produce

260,000 tons of waste per annum, and it is estimated that PVC medical products account for 5 to 10 percent of that. Over 50 million IV bags are consumed annually in Australia alone. Together with the face masks and tubing, at least 2,500 tons of locally recyclable material is available for collection and reprocessing.

The PVC Recycling in Hospitals Program collects three specific medical products (IV bags, face masks and oxygen tubing) for recycling into

useful new products. Its target is to recycle around 2,000 tons per annum in Australia. At the initiative of an Anaesthetist, the program started as a pilot project in 2009 at Western Health, Victoria; it was developed by the Vinyl Council in collaboration with the hospital. As reported, it has grown to service about 100 hospitals, mostly in Victoria, New Zealand and Tasmania.

➔ [www.vinyl.org.au/pvc-in-health-care-2/pvc-recycling-in-hospitals](http://www.vinyl.org.au/pvc-in-health-care-2/pvc-recycling-in-hospitals)

## Packaging Producer Opened New Production Facilities in France

**Mauser Group has opened new IBC (Intermediate Bulk Containers) production and reconditioning facilities together with its subsidiary National Container Group (NCG) and its joint venture partner Janus Vaten B.V. at its French site of St Priest.**

According to Mauser Group, the NCG site in St Priest (South of France) is directly connected to the new Mauser IBC production factory, thus eliminating the need for road transport of IBC bottles. Two buildings contain a semi-automatic washing line for IBCs made out of stainless steel, as well as a re-bottling line for assembly of re-bottled IBCs. The site has all necessary equipment for handling residues, repair facilities and in-line testing of re-conditioned containers.

As reported, Mauser Group is a producer of industrial packaging with approximately 4,000 employees and a consolidated revenue of over one billion Euro. Founded in 1896 and headquartered in Ootsterhout (The Netherlands), the company's portfolio for customers in the chemical, agrochemical, petrochemical, and pharmaceutical sectors as well as in the food and beverage industries includes plastic packaging, fiber drums, steel drums, Intermediate Bulk Containers (IBC),

and reconditioning services through the National Container Group (NCG), a Mauser subsidiary. The company provides sustainability-oriented full cycle services – from production to recycling ("Eco-Cycle"). With more than 100 sites and multiple joint ventures in Europe, the Americas and Asia plus two licensee networks for plastic and steel packaging, the company is a presence around the globe.

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

## International Cooperation on Textile Recycling

In 2016 began a four year collaboration to develop industrial solutions and new technologies for textile recycling.

The non-profit Swedish H&M Foundation and The Hong Kong Research Institute of Textiles and Apparel (HKRITA), a publicly funded applied research center, have entered into a four year partnership to develop technologies to recycle blend textiles into new fabrics and yarns. According to the information, the technology will be licensed widely to ensure broad market access and maximum impact.

Apparel and textile products made from blended materials account for a high proportion of all textiles and apparel in the market today. As yet no commercially viable separation, sorting, and recycling technologies are available for many of the most popular materials, such as cotton and polyester blends, HKRITA underlined. Today it would be possible to mechanically recycle single fiber fabrics such as denim jeans and wool sweaters. "However, garments are very often made from a blend of different fibers to improve fit, style, comfort and longevity. Used apparel of blended or unknown materials are either discarded in landfills or down-cycled into insulation, carpeting, and other low value applications."

The partners will develop a series of research projects with a contribution of 5.8 million Euro. HKRITA will



conduct the research and work to commercialize the outcomes. The Innovation and Technology Fund of the Hong Kong SAR Government will provide additional substantial research funding and support.

"The exact financial contribution from H&M Foundation is determined by the surplus from H&M's global in-store garment collecting program, which is donated to H&M Foundation", HKRITA said on its homepage. "Half of this donation is allocated to research on textile recycling." H&M Foundation is the initiator and main funder of the research project 2016–2020 and HKRITA is co-funding.

As reported by HKTDC, among the textile recycling techniques the institute is exploring a biological process similar to beer fermentation. The idea came from another series of projects HKRITA worked on with Hong Kong's City University, where it turned starchy food waste, such as cakes and breads from major fast-food chains and converted them into polylactic acid fibers. The resulting products were showcased in a smart fashion ready-to-wear exhibition. After that method was successful, the idea was born to go from fiber to fiber.

According to the research center, there are many advantages to this type of recycling. The scientists are using enzymes to break things down, so it is not a mechanical process, or energy-intensive. And they try to retain the original characteristics of the fiber as much as possible. The other series of projects is chemical, and researchers are investigating using ionic fluids as well as a hydrothermal approach to separate materials.

The goal is to find a cost-effective solution that can be rolled out on an industrial scale and potentially create a new industry that can process the materials. Hong Kong will be the first community to benefit from the research as the license rests in the city.

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# Canada's Waste Management Policy: Coming in Parts but Winning Together

The balance of the Conference Board of Canada based on figures from 2009 was poor: Canada ranked in last place out of 17 countries and got a "D" grade on the municipal waste generation report card. Canada produced 777 kilogram per capita of municipal waste in 2008, which was twice as much as the best performer, Japan.

The latest figures published by the Conference Board show Canada ranking the 15th place, an average of 720 kilogram of waste produced per capita and at least Nova Scotia earning an "A" grade. This certainly suggests a little bit of a progress, but is Canada actually on target to a recycling nation?

Few weeks ago, Statistics Canada offered latest official data on the Canadian waste management industry. The total amount of waste diverted to recycling or organic processing facilities has increased by 7 percent compared with 2012 to 9.1 million tons in 2014. Diverted materials from residual sources added up to 4.8 million tons; waste from the non residual resources sector – industry, commerce and institutions as well as the construction, renovation and demolition branch – amounted to 4.25 million tons. A new information on the total amount of waste was not given, just as little as specifications on the materials diverted from landfill or their recycling rate.

## 25 percent diverted from landfills

Elder figures from 2012 indicate that 25 million tons were disposed of in landfills or incinerators, according to the Conference Board of Canada. The remaining 8.4 million

tons (25 percent) were diverted from landfills by recycling, reuse or composting. Of the diverted tonnage, 40 percent was paper and related materials, and 29 percent was compostable organic materials. The remaining 31 percent were mainly glass, metals, plastics, household appliances and materials used in construction. Official data from the Environment and Climate Change Agency make clear that 33.5 million tons of solid waste was disposed of and diverted in Canada in 2012. 25.2 percent of the total waste generated was diverted from disposal. The diversion from residential sources – mostly households – reached 32.7 percent, while the share of waste diverted from non-residential sources had stayed relatively stable by under 20 percent. The solid waste diversion resulted in the capture of 3.36 million tons of paper, 2.45 million tons organic materials, 640,000 tons of waste from the construction, renovation and demolition sector, the same share of metals, 410,000 tons of glass and little above 300,000 tons of household appliances, plastics and other materials each.

## Plastic recycling – key to circular economy

In fact, there is some interest in recycling of paper and cardboard. Since several years the Carton Council of Canada registers a positive growth trend nationally remains com-

mitted to continuing to raise the recycling rate by focusing on recycling education and optimizing the end-of-life management of used cartons. In 2016 the CCC balanced that the national recycling rate for food and beverage cartons had grown significantly to 52 percent in 2015.

For treatment of organic waste, Ottawa for example instituted a green bin program in 2010 to collect and compost organic waste. According to Conference Board of Canada, many other cities have similar green bin programs or other programs to collect residential organic waste, including Vancouver, Toronto, Montréal, Moncton and Halifax. But great differences among the territories must be confessed: Nova Scotia diverted 150 kilogram of organics per capita and the Canadian average lay at 70 kilogram in 2012, whereas Manitoba not even reached 20 kilogram.

The annually produced Construction and Demolition (C&D) waste is estimated at about 9 million tons, accounting for one-third of Canada's solid waste stream. The sector is regulated by differing municipal directives, for example by-laws to outlaw the landfilling of specific construction material. Provincial steps to regulate reduction measures for C&D waste have only been undertaken by Ontario and British Columbia. So far, binding federal legislation on treatment of construction and demolition are not documented.

In April 2017, Carol Hochu, President and CEO of the Canadian Plastics Industry Association, announced a collection for recycling rate of 79 percent for plastics material.

Seventy-nine percent of the reported 322,000 tons of material was reclaimed in Canada or the U.S., and 17 percent was exported overseas. Joe Hruska, VP Sustainability at CPIA, declared that "Canada's plastic recycling infrastructure is key to our circular economy". Astonishingly, Statistics Canada lately reported officially that electronic waste recycling continued to increase in popularity, totaling just over 83,000 tons in 2014, an 18.4 percent increase in contrast to 2012. And ferrous metals showed the next greatest increase, rising by 13.8 percent over 2012 to nearly 525,000 tons.

Canadian governments began targeting the management of e-waste about 15 years ago. To date, e-waste management has become an important issue in Canada, as already in 2010 an estimated 224,000 tons of e-waste were generated there. In 2008, just over 24,000 tons of e-waste were sent for diversion via programs administered by or for municipalities, and 2010 some 150 E-refurbishing & E-recycling facilities existed across the country. Meanwhile, the Electronic Products Recycling Association (EPRA) is spread all over Canada managing 2,300 convenient collection sites, diverting 100,000 metric tons of old electronics annually and balancing the recycling of 660,000 tons since 2007.

Nearly all territories have passed regulation establishing the collection and recycling of designated electronic products, and several established a funding system for the collection of this material. The programs are ultimately substituted by consumers through eco-fees applied at the



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point of retail. The industry generally develops and implements product stewardship plans. Nine provinces have already installed Extended Producer Responsibility laws and programs; Yukon and Northern Territories were developing them.

## Jurisdiction territorially particularistic

In 2014, a comprehensive paper on Canadian's state of waste management reported still improvable waste management in some territories, little use of broad-based regulatory instruments for landfill bans on divertable materials, only two territories operating with levies on waste disposal at landfills and low landfill tipping fees in some Canadian jurisdictions. On the other hand, more than 70 regulations, standards and guidelines applicable to solid waste disposal, regarding landfilling and incineration throughout the territories are listed. And there are partially jurisdictions on waste prevention and waste reduction at source, on diversion, on monitoring and reporting of different materials and on disposal – following territorially particularistic directives and targets.

## Initiatives growing

But there are some Canada-wide initiatives too involving several governmental departments. The Canadian Council of Ministers of Environment for example acts as a forum for 14 provincial, territorial and federal environment departments; its Waste Management Task Group is responsible for the waste management work. The Canadian Standards Association is a Canada-wide not-for-profit organization to develop norms for standards. The Federation of Canadian Municipalities administers the 550 million US-Dollar containing Green Municipal Fund and founding member of the National Zero Waste Council.

Innovative practices on waste prevention include the "Business Case for Zero Waste in British Columbia" report, the regular municipal performance monitoring to track waste disposal in Nova Scotia and the required regional waste plans for designated municipalities in Québec, British Columbia and Nova Scotia. Innovative practices on waste diversion are shown by the Electronic Product Recycling Association in establishing product stewardship programs, by the operations of the National Used Oil Management Association and by the Canadian Stewardship Services Alliance offering a one-stop-shop for stewards, not to mention the voluntary industry full "Closed Loop" Recycling Program. In order to innovate waste disposal, many territories have been regionalizing their waste management facilities, several use disposal levies to fund new infrastructure, and Halifax Regional Municipality via by-law requires construction, renovation, and demolition waste to be segregated and diverted to a specialized processing center.

## A branch of 7.1 billion US-Dollar revenues

The latest Canadian Industry Statistics, 2015 edited by the national Government, presented an overview of the different facilities and services of the waste branch. The

schedule – sorted by ascending average revenue between 518,600 US-Dollar and 855,600 US-Dollar – starts with "waste management services" in a total of 1,372 establishments and a profitability rate of 80,4 percent. 2,480 establishments for "remediation and other waste management services" sum up the revenue of remediation and clean-up of contaminated sites and the operation of material recovery facilities, reaching a profitability rate of 78 percent. The 2,049 "waste collection institutions" including waste transfer stations show a profitability of 79.5 percent. Further the branch of 5,871 "waste management and remediation services" obtains 78.1 percent profitability. 375 "material recovery facilities" achieve a rate of 69.2 percent, while 733 "remediation services" are primarily engaged in remediation and clean-up of contaminated buildings, mine sites, soil or ground water: Their profitability rate lies at 77 percent. On the whole, Canadian businesses in the waste management industry had total revenues of 7.1 billion US-Dollar in 2014, up from 6.4 billion US-Dollar in 2012. And waste management activities in the public and private sectors provided full-time employment for almost 35,000 people across Canada in 2014.

## Already in the mature stage of its life cycle

With its "Vision 2050 – The New Agenda for Business Report" the World Business Council for Sustainable Development outlined a pathway for a global population living within the resource limits of the planet by 2050 – including reduced raw materials and re-engineered materials leading to closed-loop recycling and a circular approach to resources. In 2014, the Canadian Council of Ministers of Environment had to admit that their country was a long way from achieving the 2050 Vision objectives and the OECD commitments. But business analyst IBISWorld gives the branch a good testimony. Higher recycling volumes, increased regulation and greater demand for recycled materials delivered the basics. The waste treatment and disposal services industry only grew slightly over the past five years. However, in that period, the recycling facilities industry – after the opening of 80 new facilities in 2012 – has performed well with revenue growing and is forecasted to go on similar positive until 2022. Increased levels of industrial capacity utilization and steady construction activity throughout Canada have benefited the scrap wholesalers. And waste collection services could record an increased demand from municipalities seeking to privatize their waste capture systems.

This sector passed through a concentration process: The Progressive Waste Solution Ltd, now trading under Waste Connections of Canada, and Houston based Waste Management Inc. meanwhile capture more than 70 percent of the total industry revenue. Commenting on the results for the first quarter of 2017, Ronald J. Mittelstaedt, Chairman and Chief Executive Officer of Waste Connections, was highly pleased: "2017 is off to a great start, with 15 percent same store landfill tonnage increases, better than expected contribution from recent acquisitions, increased exploration and production waste as well as waste activity, and higher recycled commodity prices all driving results above our outlook for the first quarter."

# Malaysia: Toward A Sustainable Waste Management

Population growth has led to an increase in generation of solid waste in Malaysia. According to the government, it has become a crucial issue to be solved.

In 2005, the waste generated in Malaysia amounted to 19,000 tons per day (recycling rate: 5 percent). Eleven years later, 2016, the quantity was 38,200 tons/day (recycling rate: 17.5 percent). As reported, food waste is a major component of generated waste (45 percent) and contains high organic compounds. Due to unseparated waste, more than 30 percent potentially recyclable materials such as paper, plastic, aluminum and glass are still directly disposed of in landfills. In addition, diapers are evolving into a major component (12.1 percent). This situation is set to change. Considering that 16.76 million tons (or 45,900 tons/day) of waste (household waste: 70 percent; commercial waste: 30 percent) is expected to be generated by nearly 30 million Malaysians in the year 2020, the Malaysian government plans to reduce the waste disposed of in landfills. By the year 2020, the reduction shall amount to 40 percent through 22 percent recycling and 80 percent intermediate treatment such as waste-to-energy, composting and material recovery.

## Current Waste Management Technology

As landfilling is currently the ultimate waste disposal method that can deal with many types of materials, most of the garbage ends on landfill sites.



Photo: pixabay

As reported by Tey Jia Sin, Dr. Goh Kai Chen, Dr. Kek Sie Long and Ir. Dr. Goh Hui Hwang of the University Tun Hussein Onn Malaysia, most landfills in the country are small scale operations with varying designs. In addition, a lot of these sites are poorly maintained. Other disposal sites are the open dumpsites, where waste is illegally disposed of.

According to the Solid Waste Management and Public Cleansing Corporation (SWCorp Malaysia), there are only 14 sanitary landfills all over the country; 161 landfills are still in operation, while 141 are closed. As reported

by SWCorp Malaysia, there are several incinerators in the country with a capacity of 75 tons/day in total. A facility for construction and demolition waste is able to treat 500 tons per day. Organic waste is treated in collaboration with Kitakyushu City Hall, Japan (500 tons/year), in Malaysian food waste facilities (anaerobic digester: 1,500 kilograms/day) and composting plants (150 kilograms/day).

The first waste-to-energy facility in Malaysia will be located at Taman Beringin in the capital city Kuala Lumpur; it is expected to start operations in 2019 with an estimated capacity of 1,000 tons/day. Furthermore, a waste-to-energy plant is under construction. Cypark Resources Berhad is diversifying into the less cyclical business of renewable energy (RE) generation and waste management concession business to strengthen its income generating capability. The company is investing to build this plant in Ladang Tanah Merah, Negeri Sembilan. According to the information, this facility will be able to produce 25MW of power from handling solid waste disposal and has the ability to increase capacity in the future.

The sustainable integrated waste management facility would encompass the following areas:

## SWCorp

The Solid Waste Management and Public Cleansing Corporation (SWCorp Malaysia) was established to complement and ensure the successful implementation of the National Solid Waste Management Policy. In general, the policy aims to provide a comprehensive, integrated, cost-effective, and sustainable solid waste management system in line with society's demand for environmental conservation and public well-being.

The Corporation was established under the Solid Waste Management and Public Cleansing Corporation Act 2007 (Act 673) and commenced operation on June 1st, 2008 under the purview of the Ministry of Housing and Local Government (MHLG). It has the power to administer and enforce solid waste and public cleansing management laws and matters related thereto. The role of the Corporation is to ensure that solid waste and public cleansing management services will be more efficient and integrated, as well as meeting consumers expectations.

- Collection and Disposal
- Waste Receiving Facility (WRF)
- Waste Segregation Facility (WSF) with material recovery/recycling facility
- Fully Anaerobic Bioreactor System (FABIOS) Plant
- Power Generation Facility which includes Biogas Power Plant and Waste-to-Energy Plant
- Sanitary Landfill for commingled, inert solid waste and processed waste residuals
- Environmental Treatment Systems including Leachate Treatment Facility
- Salvaging Yard for combustible solid waste and recyclables
- Administration and Support Facilities
- Operations & Maintenance of Waste
- Facility Infrastructural and
- Ancillary Works

### Recycling of Electrical and Electronic Devices

An increasing volume of electrical and electronic devices (e-waste) from private households is disposed of in open landfills every year. According to a project report about e-waste in Malaysia, which was encouraged by the Japanese Department for the Environment, the amount of e-waste

grows by an average of 14 percent per year. Until 2020 around 1.17 billion devices respectively 21.4 million tons of e-waste will be gathered.

The first facility for the recycling of electrical and electronic waste should be put into operation in 2017. According to the supplier, German-based company Andritz MeWa, the plant is able to process annually around 300,000 old refrigerators and up to 60,000 tons of electrical and electronic scrap from private households, such as washing machines, household appliances, and ICT equipment including computers. Private company Shan Poornam Metals operates the first e-waste processing plant in collaboration with the public Department of Environment. The environmental authority should ascertain that 86 centers for collection are established across the country by 2018. Those centers pass e-waste on to recycling facilities in Seberang Prai in the federal state of Penang. So far there is no system for the collection and treatment of electrical and electronic waste from private households. Appropriate waste from the industry sector is handled according to regulations.

In August 2014, the Malaysian government announced plans to build an

ecological industrial park in the Klang Valley. It is intended that the park will feature a primary industry and a waste generation center to enable primary industrial waste to be reused by secondary industries. At that time it was planned to start building the park in two years' time.

### Incentives

To strengthen the development of green technology, the Malaysian government provides incentives in form of investment tax allowance for the purchase of green technology assets and income tax exemption for the use of green technology services and system. There are also incentives for the establishment of Waste Eco Parks (WEP). More information is available at [www.mida.gov.my/home/tax-incentives-for-green-industry/posts/](http://www.mida.gov.my/home/tax-incentives-for-green-industry/posts/).

Investors will find the official website of the Malaysian Investment Development Authority (MIDA) at [www.mida.gov.my/home/](http://www.mida.gov.my/home/). Its Business Information Center (BIC) at Kuala Lumpur's MIDA Sentral is a first-stop resource center with free access to useful and authoritative information on investment, trade, financing, productivity and services specifically pertaining to Malaysia's manufacturing and services sector.

## Consumption of Recycled Metal to Grow in Automotive Industry

**According to a study provided by Market Research Reports Search Engine (MRRSE), revenues from recycled metal will reach 476.2 billion US-Dollar by the end of 2024.**

Using recycled metal has also proven to be an effective measure in reducing the carbon footprint of an industrial or commercial facility, furthering the demand for metal recycling services. As announced, the valuation of the global recycled metal market will rise at a compounded annual growth rate (CAGR) of 4.8 percent between 2016 and 2024. The growing demand for recycled materials and the 'upcycling' trend are collectively aiding the overall growth of this market.

While the use of recycled metal is seen across industries such as electronics, shipbuilding, automotive, and industrial machinery, it is the

building and construction sector that currently uses the most recycled metal worldwide, a press release said. The use for recycled iron and steel in the construction sector has contributed substantially to the revenues of companies in the global recycled metal market. "While this trend is not expected to change in the short-term, the automotive industry is fast emerging as a very promising application segment for companies in the recycled metal market. The need to cut both costs and carbon emissions has forced automotive companies to look toward recycled materials. As a result of these aspects, the CAGR posted by the automotive application segment

of the global recycled metal market will be very high between 2016 and 2024."

According to the information, nearly 70 percent of all revenue of the global recycled metal market is dominated by Asia Pacific and Europe, with China being a key country. Although India's shares in the Asia-Pacific recycled metal market are currently not as high as China, the country is expanding at a high CAGR, causing the gap between India and China to close to a noticeable degree by 2024.

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



# Who Really Leads the MSW Recycling World?

Photo: pixabay

Around the world, recycling rates are widely reported – but not in ways that can be easily compared. Some eye-catching recycling rates claim need to be treated with caution. Sweden, for instance, has achieved a 99 percent rate – but only by counting combined heat and power energy recovery as a form of recycling. A new research by Eunomia finds that Germany and Taiwan lead the world on municipal solid waste recycling – but by a small and narrowing margin against third place Wales.

In the new report, Eunomia drew together recycling rate figures from around the world, and then worked to remove the inconsistencies that make such figures difficult to compare with one another. Both the OECD and the European Commission produce annual municipal waste and recycling statistics, which eliminate some (but far from all) of the inconsistencies. However, there are a few high recyclers that are members of neither organization. So the report had to consider the impact of a range of factors:

- Some EU nations (e.g. Belgium, the Netherlands, Germany) report metals recovered from incinerator bottom ash as recycled, while others (e.g. Sweden, Slovenia, Switzerland) do not.
- Germany and Austria both appear to report large amounts of inputs to mechanical-biological treatment facilities as recycled or composted, when much of the output is incinerated or landfilled.
- Singapore's data includes a substantial amount of non-household waste, such as rubble and industrial slag, which have very high recycling rates, and counts burnt wood as biomass as recycled.
- Wales, too, counts recycled rubble collected by local authorities in its totals, and includes a substantial amount of incinerator bottom ash recycled as aggregate.
- There is considerable variation in the ways in which contamination is assessed. It appears that Slovenia, for example, measures almost all material collected for recycling as recycled, disregarding the impact of contamination. Other countries count material once it has been subject to an initial sort, while others take considerable

pains to track material as close as possible to the point of reprocessing.

Eunomia's investigation of the data took into account that some of the recycling material is included/excluded: How much of the waste streams is commercial, industrial and construction? Is there any rubble to be considered? What about incinerator bottom ash including metals? Are dry recycling and biowaste streams contaminated? The definition of "recycling" and the point at which recycling is measured had to be clarified.

The adjusted Top 10 of municipal solid waste recyclers lists Germany and Taiwan in front of Wales, followed by South Korea, Belgium, Switzerland and Austria, ending with Slovenia, The Netherlands and Singapore. However, the picture would be incomplete without the packages of policy levers these nations have in place like clear performance targets and policy objectives, good funding for recycling, extended producer responsibility and incentives to encourage citizens to recycle e.g. residual restriction differential. And if the progress to be made is taken into account, Wales for example is moving towards a 70 percent target, has binding targets and scopes to improve performance and could soon overtake Germany.

The report containing detailed information on the national figures delivered can be downloaded under <http://resource.co/sites/default/files/World%20Recycling%20League%20-%20Full%20Report%20-%20FINAL.pdf>.

# Will China's National Sword Initiative Have an Adverse Effect?



Photo: Marc Weigert

During the recent world convention of the Bureau of International Recycling (BIR) in Hong Kong, there was an important topic for the future: China's reform of its scrap import regime and the potential adverse impact on the recycling business.

As was reported by the world recycling association, this issue was discussed in several sessions. In the second meeting of the World Council of Recycling Associations, BIR World President Ranjit Baxi (J&H Sales International, UK) not only announced that the first Global Recycling Day would be taking place on March 18 next year; the intention is "to co-ordinate pro-recycling initiatives across perhaps 50 or more countries". He also pointed out, that the World Council of Recycling Associations would be approaching the Chinese government for a dialogue to clarify the practical implications for recyclables trading of its National Sword import control initiative.

## Non-ferrous metals sector fears disadvantages

China's reform of its scrap import regime will have potentially far-reaching consequences for the non-ferrous metals sector, the world recycling association quoted Ma Hongchang, BIR's advisor on the country's policy and regulatory developments. It were even possible, he told delegates in Hong Kong, that the Chinese government would go as far as to ban imports of certain items of mixed metal scrap. "The Chinese authorities have not yet issued timetables for import bans or details of the categories of scrap to be affected," the BIR gave account. According to the information, copper and aluminum scrap are also to be discussed and would then be subjected to a "tough" review to determine whether imports could continue. "The speaker urged overseas suppliers to the Chinese market to 'pay attention' to the country's scrap import policy trends and to adjust their business models accordingly, urging

them to strive at all times to comply with China's environmental protection policies, regulations and standards," the BIR underlined in a press release.

Guest speaker Hong Yang of Minmetals, a company which handles 80,000 to 100,000 tons of non-ferrous scrap per annum, indicated to the same meeting that China's domestic supply of copper scrap had now overtaken imports and that this trend could be expected to continue. "Scrap imports are declining all the time," he was quoted. Domestic scrap was expected to increase by 17 percent this year alone. He emphasized that China was still the world's leading buyer of copper scrap on the international market. Imports were "likely to continue to play an important role" as government data indicated that the country would require an annual total of 4.4 million tons of copper scrap from all sources by 2020. Copper scrap imports from Western Europe and the USA were on the decline whereas Asian countries were increasing their share of total shipments to China. And the market was consolidating around importers and enterprises with sound environmental protection practices and more sophisticated processing, Hong Yang observed.

China also constituted a huge player in the secondary aluminum market and a major consumer of imported Zorba (shredded non-ferrous scrap, predominantly aluminum), delegates to the BIR Non-Ferrous Metals Division meeting were told by Masao Montani of Daiki Aluminium Industry Co Ltd, Japan's largest secondary aluminum smelter with affiliated companies in Thailand, Indonesia, Malaysia and

the Philippines. His presentation touched on Daiki's decision to more than triple the capacity of its smelter in Indonesia to 15,000 tons per year, to be fed by Zorba imported from Europe and the USA. India was another Asian market in which Daiki would consider staking an interest, he added.

### "Panic" as China turns screw on plastic scrap imports

Taking the view regarding the next five to ten years, it was possible that China would decide to stop importing plastic scrap. That was the worst-case scenario presented by the Executive President of the China Scrap Plastics Association – Dr. Steve Wong of Fukutomi Company Ltd – in light of the country's National Sword initiative to prohibit imports of any material that could contain contaminants and therefore lead to environmental pollution. As reported by BIR, a "lively rumour-mill was even suggesting that Chinese imports of film scrap could be halted as early as September this year". During any hiatus in China's imports, no other country in the region would be able to absorb the 7 million tons that the Chinese have been buying internationally on an annual basis, Dr. Wong argued. And given "yo-yoing" freight rates, the "most effective solution" for the scrap plastics market would be increased processing at source, BIR gave account. For the moment, he said, the cost of importing plastic scrap into China was "so high" and 100 percent container checking was taking place at most ports.

India was not equipped to take up the displaced tonnage if the People's Republic of China introduced a ban, insisted Plastics Committee Chairman Surendra Patawari Borad (Gemini Corporation, Belgium) as the Indian authorities still regarded recycled plastics as "harmful to human health". India's imports amounted to "less than 5 percent" of those of China and import licenses were restricted to only around 30 companies. "Though the country is growing very well, I do not expect an increase in the plastics scrap trade into India," he was cited. In an US market report also delivered by Surendra Patawari Borad, "panic" over customs clearance issues and a possible ban in China had persuaded many exporters to stay "out of the scene". In the European report from Veolia Propreté France Recycling's Renaud Pfund, he suggested Chinese regulatory developments would potentially restructure the market. And for

the Middle East, Mahmoud Al Sharif of the Sharif Group of Companies noted that only 10 to 20 percent of used plastics were entering the recycling loop in the United Arab Emirates but that recycling awareness in the Middle East was being boosted by government-led campaigns.

### Paper Division: Double headache for exporters

An "explosion" in container rates "had nearly dealt a death blow to the shipping of recovered paper," the audience was told by its outgoing President, Reinhold Schmidt (Recycling Karla Schmidt, Germany). Freight costs for shipments between Europe and China had soared more than 1,000 US-Dollar per container – or 40 US-Dollar per ton – in the opening months of 2017. During the meeting, the discussion group also spotlighted China's National Sword initiative to tackle illegal imports. Ranjit Baxi supported China's desire to eliminate incoming material that was contaminated and unsuitable for use as a secondary raw material. A "zero tolerance" approach "would affect us all" as sorting systems were unable to achieve 100 percent purity, he was quoted by BIR. But at the same time, exporters from Europe, for example, "must move their quality a notch higher". If National Sword served to deflect volumes away from China, "those tons will go somewhere", contended Brian Taylor (magazine Recycling Today), although he also acknowledged that market problems might arise in the short term.

For European OCC and mixed paper shipments to China, a steep price decline around the start of the second quarter of 2017 had been followed by an almost immediate recovery, it was explained in the European market report from new Paper Division board member Martin Soth of Sběrné suroviny UH sro of the Czech Republic. This about-face was attributable to "lower stocks and more stable container-board orders for mills in China" as well as to "the strength of fiber demand in Europe itself". In his guest presentation, Nobuyuki Shiose (Daiwa-Shiryō Co., Ltd, Japan) noted a growing preference among Japanese paper mills for dealing with those fiber suppliers able to offer larger tonnages. "It is possible to get higher prices if you can offer more volume," he said. This trend could lead to consolidation within the supply sector and create a competitive environment in which "small companies will be the losers", the BIR gave account.

## Container Weighing Systems Market

US-based company Fast Market Research has announced the availability of the new report, "Container Weighing Systems Market – Global Forecast to 2022". The market is expected to witness significant growth in the coming years owing to the increasing focus on safety for maritime transportation and the mandated SOLAS regulations to verify the gross mass of the container to be shipped. According to the information, the report covers the container weighing system market which is segmented on the basis of verticals into chemical, construction, food and beverage, manufacturing, mining and aggregates, transport and logistics, ports, waste management and recycling, and others. The worldwide market for this equipment is estimated to reach 3.95 billion US-Dollar by 2022, at a compound annual growth rate of 4.6 percent between 2017 and 2022. The market in South America is expected to grow at the highest rate during this time. "This high growth is attributed to the increasing industrial production and sea trade and transportation from South America," Fast Market Research stated. "Additionally, the increasing government focus on reducing maritime accidents is expected to drive the growth of the container weighing system market in the region." ➔ [www.fastmr.com/prod/1278451\\_container\\_weighing\\_systems.aspx?afid=501](http://www.fastmr.com/prod/1278451_container_weighing_systems.aspx?afid=501)

# Tunisia: Demand for Wastewater Treatment Technology Is Rising

Photo: pixabay



Tunisia has limited water reserves, estimated at 4.880 billion cubic meters per year. Of these reserves, around 4.660 billion cubic meters can be mobilized. At this point 3.680 billion cubic meters are used (86 percent).

Approximately 56 percent of the water deposits consist of surface waters and are therefore dependent on the rainfall. Tunisia consists of three quarters of areas with arid climate. With around 4.66 billion cubic meters accessible water reserves Tunisia counts to the most arid countries in the world. The precipitation decreases from north to south (average 1,200 millimeters/year to 50 millimeters/year), so the water reserves vary greatly in the seven bioclimatic zones. Over 80 percent is generated by the agricultural sector, while around 14 percent is provided as drinking water. With unchanging infrastructure the UNESCO is expecting serious problems with water supply for Tunisia from 2025 onwards.

Increasing water consumption caused by a highly progressive industrialization of the country and the resulting water pollution are further factors for the long-term decreasing availability of water in good quality. In the textile industry in particular laundries, dyeing and weaving mills contribute significantly to the contamination of the already limited water resources. Due to the industrial progress an increased use of water is assumable.

## Treated wastewater: for tourism and agricultural industry

The main operators in Tunisia's water sector are SONEDE (Société Nationale d'Exploitation et de la Distribution des Eaux), DGGR (Direction Générale du Génie Rural) and ONAS (Office Nationale de L'Assainissement). SONEDE has got a 100 percent responsibility for the promotion of urban drinking water. SONEDE together with DGGR is 90 percent responsible for the promotion of rural drinking water. ONAS was established 1974 for the regulation of wastewater management and since 1993 additionally assigned with the protection of the water reserves. ONAS operates 80 percent of the sewage network (sewers, pump stations, cleaning plants etc.) and is supported locally by private companies.

In Tunisia, the total of collected wastewater – consisting by 90 percent of household wastewater – is around 247 million cubic meters per year with 242 million cubic meters per year treated wastewater; this is about 5 percent of the mobilized water resources. 2014 around 240 million

cubic meters of water has been purified in 108 wastewater treatment plants (WWTP). The capacity of the plants was 818,000 cubic meters per day. In 2015 approximately 60 million cubic meters of the treated wastewater has been reused – the main quantity for tourism sector and agricultural industry: A total of 9,746 hectares of agricultural, golf and green areas are treated with treated sewage water. Furthermore, 15,000 hectares of ecosystems are irrigated with treated sewage water. Another part is fed due to infiltration in two groundwater reservoirs, approximately 3,000 cubic meters per day are used by the industrial sector.

### A total of 113 sewage treatment plants

The amount of reused wastewater is about 24 percent of the total collected wastewater. Of this, 53.8 percent flowed indirectly into the water reserves and 46.2 percent were used directly for irrigation in agriculture, parks, and golf courses. The goal is to achieve a reuse rate of 50 percent by 2020. For this purpose not only the disposal processes have to be refined, but a total of 38 new WWTPs are to be connected to the grid (of which 9 are industry-oriented). Of a total of 113 sewage treatment plants for Tunisian industrial zones in 2015 – of which only a small number is equipped with an additional third cleaning stage –, only two are currently in use. In the normal case, the wastewater from the industrial sector is fed into the municipal sewage system and treated in municipal WWTPs. So wastewater treatment in Tunisia offers scope for development and innovation: In the near future, there will be nine new industrial sewage treatment plants, which are supposed to relieve the municipal network.

### Integration of treated wastewater to be doubled

Due to the low water reserves the ONAS plans to double the integration of treated wastewater until 2020. Separate companies (e.g. from the textile sector) have already integrated internal wastewater treatment processes into their process sequences. The internal sewage treatment

plants aim to reach an up to 60 percent reintegration of the sewage in the processes. The remaining wastewater is to be fed into the municipal sewage network according to the standard NT 106.02. The ONAS strategy for 2020 also intends to reach a 100 percent cost coverage through a more stringent transfer of costs to heavily polluting companies. This will increase the industry's need for internal wastewater purification processes. Wastewater in the industrial sector is subject to Tunisian standard NT 106.02. This standard specifies the permissible pollutant content in the water in order to allow it to flow back into rivers or sea or into the sewage system operated by ONAS. For irrigation in agriculture there is standard NT 106.03.

The objectives ONAS plans for the water sector for 2020 are an expansion of the network by linking previously untapped areas (32 municipalities), the expansion of capacity through the construction of new plants (sewage treatment, pump stations, etc.), an amelioration of the infrastructure (canalization and WWTP) and likewise the amelioration of the cleaning efficiency to increase water recycling. For this purpose the ONAS funds its investment budget from both the Tunisian state (40 percent) and international donors (60 percent).

### France companies more active than German companies

According to the German-Tunisian Chamber of Industry and Commerce, numerous German companies are specialized in techniques and product solutions in the water supply and wastewater management and are regarded as a world leader. With its high-quality solutions, the German portfolio compete globally. German wastewater companies can assist companies in Tunisia in the implementation of projects, as many are specialized in specific product solutions of different sized sewage treatment plants, wastewater treatment plants and modules, treatment of sewage effluents, water storage elements, pipe systems, pump technology as well as monitoring systems. This is an enormous sales potential in Tunisia, especially in the coming years. Compared to the activity of French com-

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panies, however, a small amount of German activity has so far been observed. As an active industry there are currently consultants who are involved in creating different concepts for Tunisian companies.

### Investment needed

ONAS is, amongst others, supported by the Credit Institution for Reconstruction (KfW), which accompanies ONAS since its founding in 1974. KfW's objectives include the innovative development of the sewage sector and a consequent increase in water efficiency. At present, the cost of KfW's projects in the sewage sector amounts to around 400 million Euro, of which around 300 million Euro is planned for projects in the field of urban water management. Further projects are being prepared and will support the irrigation agriculture and urban water management. The demand for the development of wastewater technology towards a more resource efficient process in Tunisia consists. Studies carried out by DGEQV, the general directory for environment and quality of life in Tunisia (Direction Générale de l'Environnement et de la Qualité de la Vie), have shown that the increased use of treated sewage water still requires additional research and adaption to the latest state of the art. Furthermore, the availability of this alternative resource must be ensured in the desired quality. Amongst others a feasibility study on groundwa-

ter enrichment by treated sewage water was carried out, as well as a survey on the profitability of a different use of irrigation perimeters.

### Many opportunities offered

In the following years many large-scale projects are planned, including the modernization of various sewage treatment plants and the construction of a total of 38 new sewage treatment plants with overall costs of approximately 1 billion Euro. The Tunisian water and wastewater market is growing, as the trend to use treated wastewater as an alternative water resource increases. Furthermore, the demand for more effective and modern methods of processing rises. The sewage sector in Tunisia offers many opportunities for German and other small and medium-sized companies to become subcontractors, product suppliers or consultants. Many large projects require the expertise of experienced foreign companies, as well as a competent local partner in Tunisia is recommended for these projects. In the following years Tunisia will offer an enormous sales potential for companies in the field of wastewater treatment and the chance to introduce innovative and promising technologies.

For more information please contact Dr. Makram Ben Hamida, [m.benhamida@ahktunis.org](mailto:m.benhamida@ahktunis.org).

## Recovered Paper Markets: New China Rules Could Add to Volatility

**A new study, authored by RISI Economist and Recovered Paper expert Hannah Zhao, analyzes the drastic evolution of recovered paper (RCP) volumes and composition since 2000, and forecasts how these trends will shape global markets through 2030.**

In April, China announced new policies to control imports of solid waste – including recovered paper. According to the information, China imported around 28.5 million tons of recovered paper in 2016, and 20 percent of this was mixed paper. "Mixed paper is reported to have the most contaminants among the major recovered paper grades," explains Hannah Zhao, and "it is likely that mixed paper could be labeled as 'prohibited' if the quality issue cannot be solved". Therefore, it is estimated that RCP markets, which have already seen major price swings in 2017, could be further disrupted by China's new policies. 35 percent of China's mixed paper imports come from the US, and 60 percent of US mixed paper exports went to China, RISI reported.

The US paper market has rapidly evolved in recent years, which means that the recovered paper component mix has changed as well. Tissue and packaging consumption has grown, while newsprint and other graphic paper sales have dropped drastically. Single-stream recycling collection has also complicated the sorting process. These structural shifts are also reshaping the RCP markets. The component mix for old newspaper (ONP), mixed paper, and high grade categories are still in a state of flux – which means more uncertainty for the businesses that depend on RCP supplies. Beyond this core demand and supply analysis, this study also explores how the evolution of paper and board consumption and recycling systems will affect RCP prices and utilization in both paper and non-paper industries.

RISI's study on "US Mixed Paper, ONP, and High Grade Recovered Paper: Trends in Availability and Quality" provides:

- Demand, supply, trade, and price information
- Historical data and forecasts
- Factors specific to the major RCP grades, such as deinking and pulp substitutes
- The impact of the changing mix on end users of RCP material, in both paper and non-paper industries

➔ <http://www.risiinfo.com/product/us-rcp-mixed-paper/>

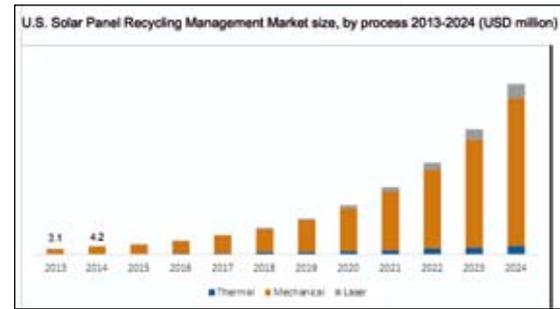
# Solar Panel Recycling Market

The market for solar panel recycling management will exceed 360 million US-Dollar by 2024 according to a new research report by Global Market Insights, Inc.

The market will be driven by increasing volume of decommissioned Photovoltaics (PV) panels coupled with strict laws to boost effective recycling. Huge untapped potential with stringent regulations to recycle increasing volumes of PV waste is set to propel the solar panel recycling management market size between 2016 to 2024. In the United States the Environment Protection Agency has laid down regulations referring to materials safety data sheets (MSDSs), toxics release inventory (TRI), resource conservations and recovery act (RCRA), California's hazardous waste control law (HWCL) and toxicity characteristic leaching procedure (TCLP) standards. In 2015 the U.S. solar panel recycling management market was valued more than 5 million US-Dollar and is predicted to witness strong growth. In 2013, UK WEEE introduced regulations that aimed at reducing solar waste by mandating manufacturers to

take back decommissioned PV panels for recycling. PV producers also need to register with Producer Compliance Scheme and update appropriate data sought by the government. The UK solar panel recycling management market share is expected to grow over 35 percent by 2024. China solar panel recycling management market size is expected to exceed 50 million US-Dollar between 2016 to 2024. Under the National High-tech R&D Program's "PV Recycling and Safety Disposal Research", specific laws and regulations will be introduced to tackle growing panel waste volumes.

For Middle East, the solar panel recycling management market share of United Arab Emirates is set to grow over 50 percent over the forecast period. The region will witness 5,000 tons of waste panels generated until 2024 subject to increasing adoption of alternate energy over conventional



fuels. Mexico solar panel recycling management market size is predicted to surpass 3 million US-Dollar by 2024, subject to growing installations of PV panels in the region. An energy transition law passed in 2015, aiming to shift focus from fossil fuels to renewable energy sources, further complementing the industry outlook.

More information on the research report by Global Market Insights can be found under [www.gminsights.com/industry-analysis/solar-panel-recycling-management-market](http://www.gminsights.com/industry-analysis/solar-panel-recycling-management-market).

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## Investing in Food Waste Treatment Pays Off

The value of food lost or wasted annually at the global level is estimated at 1 trillion US-Dollar, according to the Food and Agriculture Organization of the United Nations. Prevention is the best and most frequently mentioned method to reduce food waste and as much as the public consciousness increases, the number of initiatives to inhibit the production rises. But what happens to the almost existing and captured food waste?

The food losses per capita differ between the global regions, lead by North America and Europe with 280-300 kg/year, followed by Industrialized Asia, Latin America, North Africa/West and Central Africa with 220-240 kg/year and finally Sub-Saharan Africa and South/Southeast Asia with 120-170 kg/year. The per capita food wasted by consumers in Europe and North-America lies at 95-115 kg/year, while this figure in sub-Saharan Africa and South/Southeast Asia is only 6-11 kg/year. Even more interesting are the relations between the production to retailing and the consumption data. While developing countries lose more than 40 percent of the food at post-harvest and processing, more than 40 percent of the food losses in industrialized countries occur at retail and consumer levels, the Food and Agriculture Organization found out. These numbers are confirmed by figures from Canada, where approximately 47 percent of food wasted occurs at home. According to the Toronto Food Policy Council, the rest of 53 percent is found to be generated along the value chain when food is produced, processed, transported, sold, and prepared and served in commercial and institutional settings. Of course, the waste production volumes differ by the groups of commodity. The greatest amount is produced of cereals in Europe, North America, Industrialized Asia and South / Southeast Asia. Fruits and vegetables are mostly wasted in Industrialized Asia, South / Southeast Asia and Europe. Dairies, roots and tubers and oil crops and pulses are less wasted, meat and fish rarely.

### USA: Only 2.6 percent recovered

What happens to the existing waste? A study in 2010 certifies that in the US over 97 percent of food waste were

estimated to be buried in landfills. By numbers, food waste accounted for 28.8 million tons of the generated 230 million tons municipal solid waste. The US EPA estimated that in 2008 over 60 percent of the generated yard waste was composted, but only 2.6 percent of the food waste was recovered. Source separated organics were treated by aerobic composting mostly in one of the 273 US composting facilities. Anaerobic digestion at that time was merely offered by a medium-scaled facility. The study balances "a growing interest in the diversion of food waste from landfills and the challenge is to develop implementation strategies that are both scaleable and economical".

Meanwhile, the federal government, led by EPA and the United States Department of Agriculture, is following a United States Food Loss & Waste 2030 Reduction Goal focusing on the reduction by 50 percent over the next 15 years. However, latest figures from December 2016 published by the US EPA indicate 117,259,427 tons of food waste collected at curbside, 621,500 tons diversion through donation, 1,569,952 tons composted, 125,000 tons used for animal feed, more than 347 composting sites for food waste, 239 farm-based anaerobic digestion systems in operation, more than 1,200 water resource recovery facilities with anaerobic digesters, and nine food disposal bans throughout the United States.

### Australia: Three major food recovery services

Australia has to fight against three main barriers to effective food waste management: the complexity of food production, purchasing and consumption patterns, a lack of established infrastructure and technology for the alter-

native treatment of food waste and a lack of consumer awareness. Meanwhile, the Australian Government is promoting a strategic dialogue on food waste outcomes and standards and is implementing the Source Separated Organic Waste method under the Emissions Reduction Fund. State and territory governments, the private sector and the not-for-profit sector are largely working to address food loss and waste without Australian Government intervention. So does the food processing industry's peak body, the Australian Food and Grocery Council, fixing a target to reduce waste to landfill by 40 percent by 2020. A substantial amount of food is diverted from landfill through three major food recovery services Foodbank, OzHarvest and SecondBite. In 2014 – 2015 these charities saved and provided over 72 million meals to the community that would otherwise have gone to landfill.

### Switzerland: 75 percent to animal feed

In October 2016, the Swiss Bundesamt für Umwelt (BAFU, Federal Department of Environment) published a comprehensive study on "Organic losses of the food industry" (without fish- and meat-production). It shows that during food production 36 percent turn out to be preventable or inevitable waste. The annually loss of 500,000 tons contains 125,000 unavoidable tons of inedible parts like bones or peel waste. For 20 percent of the remaining 375,000 tons – whey or bran – a sales market lacks, and for another 20 percent – edible food – the state of technology cannot avoid wasting.

Concerning the accumulated waste, all branches recover the lion's share of organic waste as animal feed - on average 75 percent, differing between 100 percent of wasted tuber and 20 percent of waste from the production of convenience products. About 12 percent are recovered to biogas, 10 percent are composted. Three percent find a way to incineration plants, and donated food does not reach the one percent bench. Finally the study balances a high sensitization of the Swiss food production industry on food losses and confesses several efforts to minimize the losses.

### UK: Approximate figures for disposal routes

In the United Kingdom, an estimated 7.3 million tons of household food waste was thrown away in 2015. So food with a retail value of around 13 billion Pounds was thrown away rather than being eaten in 2015, UK's Waste & Resources Action Programme (WRAP) announced in January 2017. Except collection figures by local authorities, food losses by disposing down the sewer, home composting or feeding to animals were merely calculated. Latest (scarce) information on the disposal routes date from 2012. 7.0 million tons of food and drink waste were then thrown away by households.

Two thirds (4.7 million tons) of that household food and drink waste was collected by local authorities, mostly collected in curbside 'residual' or general waste. But more than half a million tons was in targeted collections of food waste, meaning it could be treated to generate energy and

useful digestate or compost. 1.6 million tons – around a fifth – was disposed of via the sewer, with drinks and dairy products making up more than half of this. The remainder was either composted at home (0.51 million tons) or fed to animals (0.28 million tons).

The figures of Scotland's food waste are equally approximate. According to a study by Zero Waste Scotland in Autumn 2016, 65 percent of the 410,000 tons of food and drink waste went into the municipal waste management system and are dealt with by local authorities. The remainder was disposed of by other routes – most significantly home composting and down the sink: 150,000 tons were disposed to the sewer and composting and feed for animals comprised 69,000 tons.

### Mostly composting and anaerobic digestion

According to WRAP, it seems that the mainly used processes to recycle food waste in the United Kingdom are in-vessel composting (IVC) and anaerobic digestion (AD). Both treatment methods including biogas technology are used too in the Middle East, especially in the Gulf Cooperation Council region, where the mushrooming of hotels, restaurants, fast-food joints and cafeterias resulted in the generation of huge quantities of food wastes, the environment protection platform EcoMena notifies. In Singapore, the National Environment Agency is interested in another strategy to recycle food waste. Currently homogeneous food waste from food manufacturers is already segregated at source and sold to recyclers for conversion into animal feed. The agency wants more on-site food waste segregation by hotels, shopping malls and schools and the conversion of that waste into compost for landscaping purposes or water for non-potable use. A pilot project was launched to assess the economic viability and operational feasibility of collecting and transporting source-segregated food waste to an off-site treatment facility. There the food waste will be co-digested with used water sludge and produce biogas from the anaerobic digestion process.

### A 14 Euro return

In January 2017 WRAP reminded of the Courtauld Commitment 3 target to reduce food and packaging waste by 33 percent until 2015. The target was met, 219,000 tons of food and packaging waste were prevented, the value of the food savings alone were worth an estimated 100 million Pounds. This resembles what a study from March 2017 conducted by the World Resources Institute found out: Reducing food loss and waste can generate a triple win – for the economy, for food security, and for the environment. Even more: For every Euro the reviewed companies invested in combating food loss and waste reduction they realized a 14 Euro return. Or as the Dutch Rabobank expressed it: "Investing in food waste pays off". This applies to the life circle of food from production to consumption as well as to food waste treatment. The latter offers possibilities and chances, not only to key players like Remondis SE & Co. KG, Republic Services Inc., Waste Management Inc., Indaver N.V., Skip Shapiro Enterprises, LLC, Suez Environnement and Veolia Environnement.

## Enerkem's Four-Step Thermochemical Process Goes Commercial

In less than five minutes, waste-to-biofuels and chemicals producer Enerkem's technology turns household waste into 99.9 percent pure liquid chemicals and biofuels.

In Enerkem's system, different feedstocks – solid waste coming from several municipalities and other types of residue – are converted into methanol, ethanol or other renewable chemicals. In turn, methanol is a chemical building block for the production of secondary chemicals such as olefins, acrylic acid, n-Propanol, and n-Butanol, which can then be used to form thousands of everyday products. Now Enerkem Inc. has announced that its first full-scale commercial facility, located in Edmonton, Alberta, has met all operational milestones.

Enerkem's four-step thermochemical process includes feedstock preparation by sorting and drying, gasification by converting residues into synthetic gas, cleaning and conditioning of the syngas and its conversion into renewable products like biofuels or chemicals.

"We have been impressed with Enerkem's discipline and commitment throughout the process of ramping-



Photo: Enerkem

up the world's first commercial operation of its kind", said Greg Dimmer, Managing Director IAM Private Debt Group. "As Enerkem's senior lender we look forward to expanding our partnership through future financing opportunities as the company continues to expand its market outreach." "The Enerkem Alberta Biofuels facility in Edmonton is fully operational in accordance with very rigorous production criteria", underlined Vincent Chornet, President and Chief Executive Officer of Enerkem. "This third-party validation comes in at the right time as we are expanding our foot-

print in North America and Europe." In fact, the construction of a waste-to-chemicals plant in the Netherlands partnership based on the innovative technology developed by Enerkem is planned: A partnership consisting of AkzoNobel, Van Gansewinkel, Air Liquide, AVR, Enerkem and Port of Rotterdam has announced that it is looking to build the plant in Rotterdam in collaboration with the Port of Rotterdam, the City of Rotterdam, the province of South Holland and InnovationQuarter.

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

## Awarded Waterox Executes Total Purification of Toxic Industrial Wastewater

Aquarden Technologies ApS, based in danish Skævinge, has developed Waterox. The Waterox process completely destroys problematic substances in wastewater from industries directly at the source.

This type of plant is the first of its kind in Denmark. It is also one of the first in the world that can transform toxic industrial wastewater to pure water based on the SCWO-technology, according to the Danish company.

SCWO stands for SuperCritical Water Oxidation. The Aquarden reactor

heats and pressurizes wastewater and air to above 374 °C and 221 bar. At these conditions water turns supercritical. Inorganic salts are concentrated as brine, which can then be safely disposed of or diluted. The salt-free supercritical wastewater is then further heated to 450 to 550 °C, where all organics – including the toughest of harmful toxic compounds – are completely destroyed. The end product is water virtually free of salts and organics and can be disposed of through the sewage system, sent to the sea, or re-used as process water.

Waste streams are typically industrial wastewater with hardly degradable organic and toxic components containing e.g. PAH, API (Active Phar-

maceutical Ingredients), phenolic wastewater, BTEXN, hormones, endocrine disruptors, solvents from chemical industry, biologically hardly-degradable detergents, polymer, landfill leachate etc. from industries like pharmaceutical, chemical, biotech, landfill and hospitals.

Zhuoyan Cai, CEO and founder of the Danish company, has received the European Business Award for the Environment in Denmark on behalf of Aquarden Technologies. The award is given to the development of a new product or a new service that significantly contributes to a sustainable development and innovation.

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



Photo: Aquarden Technologies ApS/Thomas Brolyng Steen

## A New Treatment Plant for China

The mechanical biological treatment (MBT) plant for municipal solid waste (MSW) in Lianyungang is under construction. The completion is scheduled for the end of 2017.

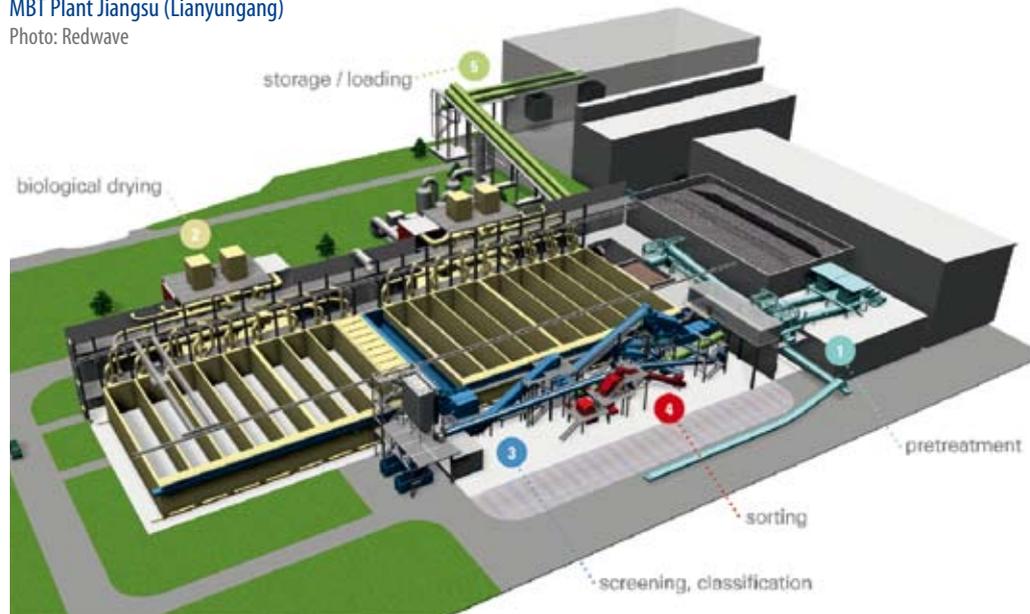
More than 200 waste-to-energy (WtE) plants are operating in China nowadays. One of them in the City of Lianyungang, Shandong Province north of Shanghai, will be complemented by a pre-treatment plant for municipal solid waste (MSW). The Austrian-German technology firm Redwave designed the process of the entire plant. In China household waste has a different composition in comparison to Europe. It has a relatively high content of organics and moisture, so when incinerated a lower energy efficiency is achieved. Depending on regional conditions the calorific value of MSW in China is in the range of 3 to 6.7 mega joules/kilogram, which is far less than the 9 to 11 mega joules/kilogram in Europe. According to Redwave, the client China Jinjiang Environment Holding Company Limited placed the order for the supply, installation and commissioning of the Lianyungang MBT plant (mechanical biological treatment). It is designed for an annual throughput capacity of 273,750 tons based on a daily input of 750 tons. "The client's request was to increase the calorific value by drying the waste from an incoming moisture of 50 percent to a maximum moisture content of 30 percent," the provider gave account.

### The process

Starting from a deep bunker a fully automated delivery crane conveys

### MBT Plant Jiangsu (Lianyungang)

Photo: Redwave



the waste into the hopper of the pre-shredder. Via an overbelt magnet for ferrous separation the pre-shredded material is fed to an intermediate bunker. From there a fully automated overhead gantry crane conveys the waste to one of the 18 bio-drying units. When ambient or re-circulated air ventilates the material in the box it heats up by an aerobic microbiological process. The water is discharged of the drying box in the form of water vapor and the dry material remains in the box. Due to the individual control of each box it is possible to guarantee even and efficient drying. The relevant data like the flow rate of circulated and fresh air, heat output capacity and the temperature curves are ana-

lyzed in the process control. Each bio-drying unit has a removable lid on top designed as self-supporting insulated steel structure. The drying process inside the unit proceeds independently from the outside climatic conditions.

After the bio-drying, the dried waste is processed in various steps including screening, airstream sorting, shredding, overbelt magnets, eddy current separators (ECS) and Redwave sensor based sorting systems and is turned into a high quality homogenous solid recovered fuel (SRF) with a calorific value of approximately 12 to 14 mega joules/kilogram.

➔ [www.redwave.at](http://www.redwave.at)

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Shredding and screening are the key processing steps needed to turn waste into the desired raw material. As familiar as they may be, Komptech can always find ways to give them a new spin.

Whether wood, biomass, green cuttings or organic waste, waste treatment will always be influenced in a fundamental way by the shredding at the start and the screening at the end of the process. In shredding the material is not chopped with sharp blades like in a chipper, but reduced to small pieces with blunt teeth. The resulting breakage gives the pieces comparatively large surface area, promoting faster biodegrading and thus better composting. Komptech offers a notably wide variety of shredding machines to cover any imaginable application.

### High and low speed: Right for their jobs

The low-speed dual-shaft Crambo direct has an extra-large shredding chamber with two 2.8 meter counter-rotating toothed drums that ensure positive feed. From bulky branches and cuttings to rootstocks of any size, to used wood contaminated with contraries, it shreds the material all down to a set granular size. The degree of shredding can be adjusted flexibly.

The mobile Crambo direct is powered by a modern Caterpillar diesel engine with the latest exhaust scrubbing and has a drive train that combines the functionality of hydraulic with the efficiency of mechanical drive. The

Drum screens like the Nemus shown here are very robust and proven machines



The high-speed Axtor universal chipper is one of the most flexible machines for processing wood and green cuttings

Crambo is also still available in a pure hydraulic version as well.

The high-speed Axtor universal chipper is one of the most flexible machines for processing wood and green cuttings. In shredder mode with free-swinging teeth it makes material for composting, while in chipper mode with fixed blades and lower speed it makes biomass fuel for heating plants. Conversion from one mode to another is fast and easy. Its most important features are a low-emissions Caterpillar diesel engine in a maintenance-friendly underfloor position, and above it a wide-area forward-facing feed with aggressive intake and high 100 centimeter clearance. Everything that goes on the feed ramp is immediately captured and taken in by the feed system. The machine is capable of up to 300 cubic meters per hour.

### Star or drum – it is the utility that matters

Komptech has a lot to offer in screening as well. The Multistar mobile star screens can split material into up to three fractions in one pass, while at the same time breaking up clumps. What is more, the operator can change the grain size of the fractions within seconds from the control panel. Easy operation, efficient electric drive with current from a diesel generator or directly from the grid, and additional options like wind sifter, magnet and rock trap make Komptech a

star screen technology leader. Drum screening is a robust, highly functional technology. It can be used for any task, be it biomass, compost or soil production. On Komptech machines the drum can be changed simply and quickly for wide flexibility, while delivering heavy-duty performance under extreme conditions and with difficult materials. Most problems can be dealt with easily by the operator. The technology is tough and proven effective. With the Primus, Maxx, Nemus and the electric-powered Cribus series, Komptech offers a wide range of drum screens that cover any customer requirement.

### The new Multistar One

The new Multistar One star screen makes treatment of waste wood and biomass even more efficient. It separates out a defined useful fraction while returning overlengths to an upstream shredder like a Crambo or Terminator. With a feed hopper designed for precise material transfer to the generously dimensioned screen deck, a discharge conveyor with four meter discharge height and a return conveyor that can pivot through 220 C°, the new one realizes a throughput of up to 200 cubic meters per hour. Its very compact crane lift frame and variable conveyors for flexible setup, plus electric drive, make it a highly economical machine.

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

## New Sorting System Uses Artificial Intelligence

Technology provider Bulk Handling Systems (BHS) has announced the arrival of Max-AI technology, an artificial intelligence that identifies recyclables and other items for recovery.

"Through deep learning technology, Max-AI employs both multi-layered neural networks and a vision system to see and identify objects similar to the way a person does", BHS assures. "The technology will drive improvements in Material Recovery Facility (MRF) design, operational efficiency, recovery, system optimization, maintenance and more."

According to the information, the first available machine utilizing Max-AI technology is an Autonomous Quality Control (QC) unit that sorts container streams following optical sorting. This robotic sorter uses its vision system to see the material, its artificial intelligence to think and identify each item, and a robot to pick targeted items. "This system is able to make multiple sorting decisions autonomously, for example separating various materials such as thermoform trays, aluminum and fiber while removing residue from a stream of PET bottles", the technology supplier says. "All of this is done at rates exceeding human capabilities."

As reported, the first commercial Autonomous QC unit is already in operation at Athens Services' Materials Recovery Facility (MRF) in Sun Valley, California (USA). A recipient of the



Photo: BHS/Nihot

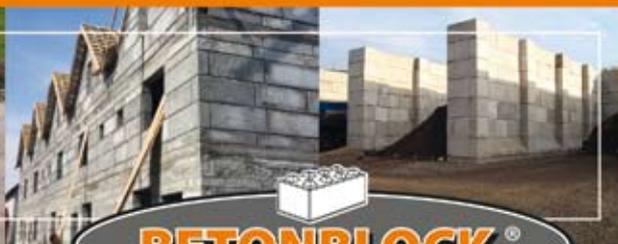
"Max-AI" is an artificial intelligence that uses machine vision to analyze and sort material streams

SWANA Award for Excellence in 2016, Athens was an ideal location for the first installation of Max-AI robotic sorters to complement the advanced screen, air and optical separation technology already in use. Integrating seamlessly with the company's existing NRT optical sorters, "Max" provides a fully autonomous PET sorting solution. According to BHS, this technology was simply not possible until now. Recent advances in computer processing capabilities had enabled

the company to develop this machine learning platform. "Max" is central to BHS' plan to bring autonomous optimization to MRFs over the coming years, increasing performance and profitability. This is seen as revolutionary for the recycling industry, because operating costs will go down while uptime, throughput, recovery and purity will all increase, leading to significant economic benefits.

➔ [www.max-ai.com](http://www.max-ai.com)

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## Australasian Waste & Recycling Expo

August 23 – 24, 2017, Melbourne (Australia)

The Australasian Waste and Recycling Expo (AWRE) moves from Sydney to Melbourne. According to the organizers, this two-day exhibition is the “most established commercial event dedicated to the Australasian waste and recycling marketplace”.

As reported, AWRE attracts exhibitors and industry professionals from across Australia, New Zealand, Asia, the United Kingdom and North America who are looking for new ways to collect, sort and process waste from the municipal, commercial and construc-

tion sectors. There are opportunities to network with waste and recycling decision makers from industry and government and to attend seminars as well as workshops.

➔ <http://awre.com.au>

## IFAT Africa 2017

September 12 – 14, 2017, Johannesburg (South Africa)

In September, local and international representatives from the environmental sector will meet at the Johannesburg Expo Center for the second edition of IFAT Africa. The event will focus on water, sewage, refuse and recycling. The south of the continent has been suffering for many months from a severe drought. This further increases the pressure which is already on the water supply due to rapid population growth and continuing urbanization. Infrastructure development should assist in alleviating problems. As Germany Trade & Invest (GTAI) reported, the South African Department of Water and Sanitation has identified relevant projects with an investment volume of 2.7 trillion Rand (over 178 billion Euro) to be carried out between now and 2035. The lion's share of the projects will focus on greater use of surface water, which is already under considerable pressure. This will require, among other things, new dams, pumping stations, pipelines and treatment facilities. South Africa's neighbors also want to and must invest in their water infrastructure. Botswana, for example, is

planning a pipeline project. By 2019, 1.4 billion Botswana Pula (over 131 million Euro) will be spent on improving the North-South Carrier which will pump water from the newly built Dikgatlong dam over 350 kilometer as far as Gaborone, the capital city of Botswana.

The groundwater reserves in Southern Africa will also play a key role in the future water supply. Namibia is currently carrying out researches into the newly discovered Ohangwena II aquifer. If the planned development project goes ahead, it will create business opportunities for modern drilling technologies, special materials for deep wells and filtering systems.

The thirsting countries are also increasingly looking at the ocean. According to GTAI, three complete feasibility studies for desalination plants for the South African cities of Cape Town, Durban and Port Elizabeth have already been submitted. In the longer term, desalination plants could provide around a tenth of the water supply in the Cape. Namibia is also planning a modern desalination plant subsidized by the KfW Development Bank. A feasibility study will be produced by the end of 2018. In addition to developing new supply channels, using water resources more economically and intelligently will be crucial. In South Africa, crumbling pipeline systems and illegal water extraction mean that huge amounts of drinking water are lost. In certain areas, 70 percent of the amount originally provided can be lost in this way.

The country's larger cities are therefore increasingly on the lookout for systems to detect leaks and for modern pressure management. This will also generate a need for new pumps, valves and water meters. To prevent half of the water from evaporating in reservoirs, more water will be stored in future underground in Namibia. In years with heavy rainfall, surface water collected from the three-dam system will be stored in the Windhuk Aquifer so that it can then be used during periods of drought. According to GTAI, the “Windhoek Managed Aquifer Recharge Scheme” will cost around 700 million Namibian Dollar (over 48 million Euro) and will require drilling systems, pumps, pipelines, filtering systems, etc.

### Reusing waste water

A further element in the combination of measures against drought in Southern Africa is the reuse of (partially) treated waste water wherever possible. Potential users of this service water include not only agriculture and industrial companies but also municipal institutions, offices and residential buildings. According to the GTAI's observations, industry in Namibia is investing in water recycling systems with their own water treatment facilities, in part due to pressure from restrictions imposed by the state. And in South Africa, there will be promising business opportunities for small-scale treatment systems as part of decentralized structures.

➔ [www.ifat-africa.com](http://www.ifat-africa.com)

Photo: Messe München GmbH



## IFAT India 2017

September 26 – 28, 2017, Mumbai (India)

Between September 26 and 28, 2017, IFAT India – trade fair for water, sewage, refuse and recycling is again bringing together all the market partners from the Indian environmental sector in the Bombay Exhibition Center in Mumbai. For this year's edition, India's leading trade fair for environmental technologies partners for the first time with The Energy and Resources Institute (TERI); the Indian think tank and the trade fair organizers are putting on the first Environmental Technologies Conference by TERI – powered by IFAT India.

According to Katharina Schlegel, Exhibition Director of the IFAT trade fairs abroad at German-based Messe München, the conference will create a forum at which expert knowledge can be shared and current political measures can be discussed. The Environmental Technologies Conference will accompany the trade fair in Mumbai on September 26 and 27. The conference program covers the classical IFAT

India themes of water, sewage, refuse and recycling and takes into particular account the aspect of sustainability. IFAT India's Active Learning Center remains part of the event as well and presents a platform for youth development and professional education. "The market for environmental technology holds great promise in India," Dr. Annapurna Vancheswaran, Senior Director at TERI, underlined the significance of the new cooperation. "There is a need to exchange knowledge in this area for a range of strategically important reasons, such as strengthening action against climate change. The partnership with IFAT India fosters stronger dialogues in the area of technology. This is crucial to accelerate the deployment of clean environmental solutions."

With its products and solutions, IFAT India addresses the Indian market in particular, the organizers assure. As reported, a total of 143 exhibitors and 5,187 visitors took part in the last



edition of the trade fair. Spread over 6,100 square meters – a 23 percent increase in space compared with the previous year – 2016 was the biggest IFAT India trade fair so far.

➔ [www.ifat-india.com](http://www.ifat-india.com)

Photo: Messe München GmbH

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## Canadian Waste to Resource Conference 2017

October (24), 25 – 26, 2017, Niagara Falls (Canada)

The 8th Annual Canadian Waste to Resource Conference will be held in Niagara Falls – beginning on Tuesday, October 24th, 2017 with the Opening Gala Reception and held in conjunction with the Waste & Recycling Expo Canada. The organizers are expecting over 275 special guests, speakers and participants to join in. Plenary sessions take place on Wednesday,

October 25th and Thursday October 26th, 2017.

As reported, this year's Canadian Waste to Resource Conference will provide a forum for presentations for the waste and resource sectors across North America. This conference is of interest to waste generators, stewards, brand owners, municipalities,

private waste sector companies and property management companies. "The CWRC will be held in a setting where all participants can share ideas and includes conference presentations as well as networking opportunities for interaction and discussion," the organizers assure.

➔ <http://cw2rc.ca/>

## Eco Expo Asia 2017

October, 26 – 29, 2017, Hong Kong

Eco Expo Asia – International Trade Fair on Environmental Protection is set to present its 12th edition at AsiaWorld-Expo, Hong Kong. Organized by Messe Frankfurt (HK) Ltd and the Hong Kong Trade Development Council (HKTDC), and co-organized by the Environment Bureau of the Government of Hong Kong Special Administrative Region, the expo will serve as a gateway to the flourishing green market in Asia,

the organizers are convinced. According to the information, this year the expo will introduce the new theme "Innovative Solutions for Greener Cities", which is comprised of the highlighted categories of green buildings and energy efficiency, green transportation, waste management and recycling as well as water treatment and quality management. "Also, there will be a spotlight on green start-ups

focused on innovative sustainable development and related solutions," the organizers announce.

Eco Expo Asia aims to serve as an all-inclusive platform that offers greener solutions as well as enables companies, government officials and individuals to connect.

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

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**No. 3/2017 – 12. September 2017**





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Japan Special Guest Country: activities and much more...



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[www.sardiniasymposium.it](http://www.sardiniasymposium.it)

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