

The REMONDIS Group magazine

REMONDIS AKTUELL

remondis.com

SPECIAL EDITION

**RECYCLED
RAW MATERIALS**



The no. 1 choice for the future!



10bn

10 billion people will be
living on our planet in 2050



75%

of the world's population will then
be living in megacities

RAW MATERIALS ARE FINITE. IS THE SAME TRUE FOR OUR FUTURE?

According to the latest calculations, we need approx. 1.7 planets to cover our annual consumption of the Earth's raw materials – a figure that is rising all the time.



7bn

tonnes of waste will then
be generated every single day



14

raw materials have already been categorised
as critical and could hold back technological
progress and economic growth

Raw materials are finite.
Is the same true for our future?
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Flag

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Ludger Rethmann, REMONDIS Board Chairman

Dear Readers!

There are some things in life that are unavoidable simply because it is impossible to foresee them. Other things though could have been prevented if those involved had been perhaps a little more mindful and taken that all important look ahead. Would the Titanic have hit the iceberg at full speed, if Captain Smith and his crew had seen the ice before it was too late? Very unlikely. They had received ice warnings but the ocean was calm and everyone was fine on board the ship. The majority of the passengers were in good spirits – right up until the collision happened. We humans are in a pretty similar position in the 21st Century. We have received warnings about the impending effects of climate change and we have been told that supplies of natural resources are already running low – and yet we are still sailing at full speed towards a head-on collision. Despite the fact that the UN recently officially confirmed that the world’s population will have reached 10 billion people by 2050. 10 billion who will all want to live as comfortably as we Europeans already do today with our 22-tonne consumption of raw materials per capita per year. China, for example, currently only consumes 11 tonnes per person per year. We continue, for the most part, to turn a blind eye to the fact that our planet simply does not have enough raw materials for such a scenario and – even if there are sufficient supplies of some materials – it would not be particularly smart to continue to mine and consume them in such large quantities if the problems of climate change are to be overcome.

Maybe human nature lies at the root of the problem. Our lives run in a straight line – from when they begin, to when they end. Linear thinking is in our genes so to speak. And this is precisely how we have always developed and made our products since we used the very first axe. From the idea at the beginning, to using the product, all the way through to the final moment when the product is broken and can no longer be used. There is no afterwards. If a sustainable economy is to be created, however, it is high time that this line is transformed into a circle.

Practicable solutions to solving our supply problems have been around for a long while now. All around the world, people have been carrying out research work to find new technologies and better systems to enable raw materials to be recovered so that they can be reused. Recycling must finally do what its name implies, i.e. create loops so that all raw materials can be returned to production cycles. Economic growth and the consumption of raw materials must become separate from one another. A few major steps must be taken before that is possible though. Firstly, an ecodesign directive needs to be introduced across Europe that not only places importance on energy efficiency (as is the case at the moment) but also on raw material efficiency and the recyclability of products. Secondly, far more money needs to be invested in researching, developing and setting up more and better sorting and recycling facilities to ensure the recovered raw materials are of the highest possible quality. And thirdly, politicians need to create incentives to encourage industrial businesses to use more recycled raw materials in their production processes. Digitalisation and e-mobility, in particular, need huge volumes of raw materials. The most environmentally friendly source – one that also allows us to remain independent – is recycled raw materials.

Our steamship is still more or less intact but it continues to sail towards a head-on collision with Mother Nature. It is not too late to change course, though, if we reach the right conclusions and take some mindful and far-sighted steps towards more and better recycling. There are plenty of reasons to be optimistic – quite a few of which can be found in this issue.

Yours

Ludger Rethmann



**WHEN I'M
BIG, WILL
WE GET THE
THINGS WE
NEED FROM
SPACE?**

NICLAS, 5



Raw materials are finite. Is the same true for our future?

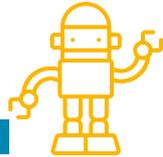
According to the latest calculations, we need approx. 1.7 planets to cover our annual consumption of the Earth's raw materials – a figure that is rising all the time. This development not only directly impacts on our ability to provide people with what they need but also on our social framework and the competitiveness and sustainability of our economy. What's more, it is being fuelled by social megatrends such as spreading urbanisation as well as by the environmental damage caused by mining activities. Our supplies of raw materials are finite – we need to make sure that our future doesn't become the same.





NASA researchers identify the scarcity of raw materials as the greatest threat to civilisation

In 2017, scientists working at the Universities of Maryland and Minnesota presented the initial results of their research work on 'human and nature dynamics', a project commissioned by NASA. This research paper explains how the correlation between social inequalities and the over-exploitation of natural resources is the most important criterion leading to the collapse of civilisations. Our society is, the researchers say, heading straight towards collapse. Other recent studies, trends and developments come to similar – if less drastic – conclusions.



Emerging technologies in jeopardy

Digitalisation, the 4th industrial revolution (or Industry 4.0), e-mobility, the switch to renewables and technological developments in aviation are all fields in which the demand for specific metals and materials is expected to increase rapidly. And, the BDI [The Federation of German Industries] says, it is precisely these raw materials which industries may find difficult to get hold of in the future. The EU has named at least 14 critical raw materials where access to supplies is at risk and, as a result, may hold back technological progress and economic growth.



Experts and decision-makers are aware of the problem

In the Fraunhofer Institute's study, 'Raw materials for emerging technologies', the experts and decision-makers not only assume that demand will increase, they are also very much aware of just how relevant this problem will be. Looking at the 11 areas that potentially pose a risk to our way of life, they name the scarcity of energy and raw materials as the second-greatest risk most likely to damage our economy – just behind a possible collapse of the financial markets. Besides affecting the economy, this would also impact on society and the environment.



From towns to megacities

The UN defines a megacity as any town with more than 10 million inhabitants. There are already 18 such megacities around the globe and 45 cities with over 5 million inhabitants. 75% of the world's population will be living in megacities by 2050. At the same time, around 75% of global energy production will be consumed in megacities and almost 7 billion tonnes of waste generated every single day. These are huge numbers – and the challenges will be just as great to provide the logistics needed and to satisfy the demand for raw materials.



Nature on the retreat

More often than not, mining activities end up destroying the countryside and polluting the environment. Many cases can be found – in South America and other parts of the world including Germany – where damage has been done to the countryside that is practically impossible to reverse. At the same time, long-distance transport from faraway regions is having a hugely negative impact on the environment.



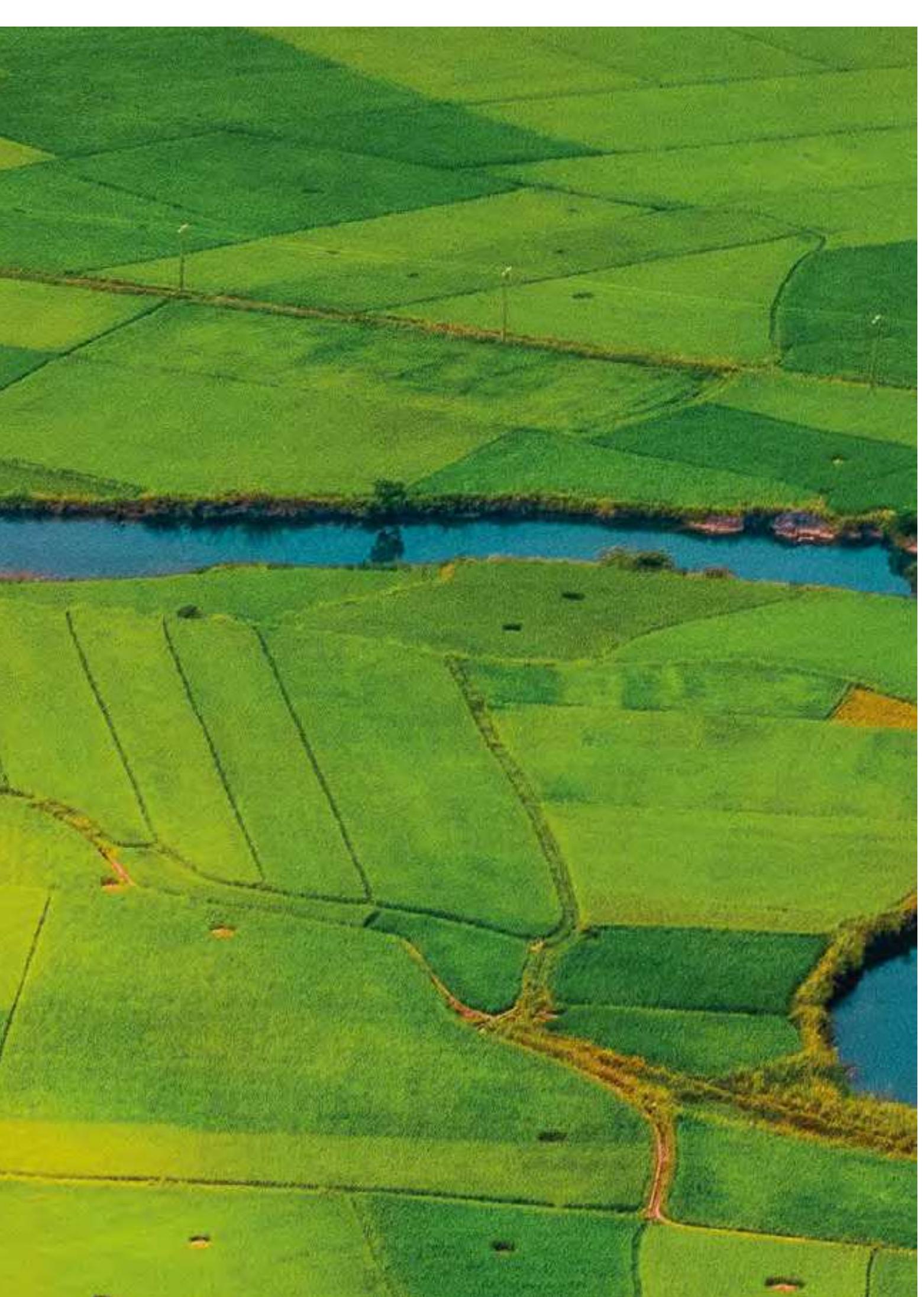
Heading into the future with REMONDIS

Emerging technologies, urbanisation, the destruction of our countryside – these all directly impact on humans, on our ability to live in peace with one another and on economic stability. The fundamental principle behind all our company's operations is to provide a reliable and sustainable supply of recycled raw materials. Indeed, REMONDIS' combination of high quality recycled raw materials and first-rate services make an important contribution towards creating a better future in many different ways. A whole variety of materials are being recovered and returned to the economic cycle as top quality products. REMONDIS' research departments are constantly looking at ways to develop new technologies so that as much waste as possible – preferably all waste – can be reused. Why? Because closed loops are essential if progress is to continue to be made in the future.

An aerial photograph of a lush green agricultural landscape, featuring a winding river and a small globe icon. The globe is positioned at the top of a teal-colored geometric shape that frames the text. The text is written in white, bold, uppercase letters, arranged in a blocky, staggered format. The background is a vibrant green field with a blue river, and the overall composition is modern and clean.

AS FOR THE
FUTURE, YOUR
TASK IS NOT
TO FORESEE IT,
**BUT TO
ENABLE IT.**

ANTOINE DE SAINT-EXUPÉRY



The seven wisdoms of sustainable development

WHY RECYCLED RAW MATERIALS ARE THE NO. 1 CHOICE FOR THE FUTURE

The future is just around the corner and it will create some huge challenges for the human race. According to UN forecasts, there will be up to 10 billion people living on our planet in 2050. At the same time, the global middle class will grow exponentially as will the pro capita consumption of raw materials. Whilst today, Europeans already consume on average 22 tonnes per person per year, consumption in China lies at just under 12 tonnes. In contrast, people living in India consume on average a mere 4 tonnes although this figure is rising rapidly. Humans are already living well beyond their means. Earth Overshoot Day – the day when humanity has exhausted nature’s budget for the year – was on 01 August in 2017. Which means we are already consuming resources from 1.7 Planet Earths every year. The simple truth is that our future demand for raw materials will not be able to be covered by so-called primary raw materials. If the human race wishes to live together fairly and peacefully in the future then there can only be one source: recycled raw materials!



Humans are already consuming resources from 1.7 Planet Earths every year

There is not a single technical nor economic reason why recycled raw materials should be considered to be a second-rate product. And this is most certainly true when it comes to environmental protection, social compatibility and combating climate change. Indeed, a closer look at the facts

shows that metals, paper, plastics, mineral aggregate, base chemical products and even energy and heat from the recycling sector are far superior – making them instead the no. 1 choice.



1 Recycled raw materials are of the same high quality!
No matter how many times a metal is smelted down, it remains the same metal with no loss in quality. Even materials, such as paper and plastic, can be recycled efficiently a number of different times and are a suitable and sustainable source material for various types of product, no matter which stage of their life cycle they may be at.

2 Recycled raw materials are available on home markets and help make local industrial businesses less dependent on imports!
It is often said, with a certain amount of pride, that 14% of the total volume of raw materials needed by manufacturing businesses in Germany are supplied by the recycling sector. Looking at global warming and our environmental problems the question here should really be: Why only 14%?

3 Recycled raw materials are so much better for the environment!
Hardly any land is consumed to produce recycled raw materials. No-one has to first dig large holes in the ground to extract 500 tonnes of copper ore to produce just one tonne of pure copper. That amount of copper can be found in a good 10 tonnes of e-waste.

40 times less energy is needed to produce recycled raw materials, helping to cut carbon emissions!
Huge amounts of energy are required to produce copper, aluminium, iron and other metals from their various ores, all of which leads to high levels of carbon emissions. A fraction of the energy is needed to produce the same quality of raw materials from recycling processes. Up to 8% of the crude oil processed in Europe every year is used to make plastics. No crude oil is needed for recycled plastic. If the shorter transport routes are also taken into account, then it becomes very clear that all recycled raw materials are a much better and far more sustainable option to help prevent climate change.

4

5 Recycled raw materials are more socially acceptable!
Companies that purchase recycled raw materials sourced from local volumes of waste are also helping to reduce the overexploitation of raw materials in politically unstable countries with their social inequalities and ineffective environmental laws – and the often catastrophic effects such overexploitation has on local communities and the local environment. Recycled raw materials are raw materials that involve neither child labour nor exploitation.

6 Recycled raw materials are easier to procure, lowering the pressure on local industrial businesses to find source materials!
Delaying decisions does not lead to a better outcome and this also applies to the price of oil and other raw materials. Our planet's growing population cancels out any gains in efficiency we may achieve – the so-called rebound effect. Those who wish to continue to have cost-effective and sustainable production processes in the future will have to increase the amount of materials they buy from local, environmentally friendly sources.

7 Recycled raw materials safeguard industrial locations in Europe and secure jobs!
Looking at the medium-term picture, industrial locations will only be able to survive, if they have access to affordable raw materials that have been produced with as little impact as possible on both our environment and climate. This is particularly true for countries, such as Germany, that have so few natural raw materials of their own and expect their production activities to meet stringent environmental standards. Recycled raw materials are the only true source for a sustainable future.

A meaningful ecodesign directive should make it obligatory to use sustainable raw materials. The long-term aim must be for industrial businesses to publish the efforts they are making to achieve sustainable development and for them to announce with pride that they are increasing the amount of recycled raw materials used to make their products. At the end of the day, environmentally responsible consumers want to know whether the product they are using has been produced with clean, sustainable and climate-friendly processes. There really is only one way to meet all these requirements:
to use recycled raw materials!



The image features a background collage of various metal scrap pieces, including rusted sheets, pipes, and cylindrical components. A semi-transparent orange banner is overlaid on the right side, containing white text. A small globe icon is positioned at the bottom center of the banner.

THE LEFTOVERS OF
OUR THROWAWAY
SOCIETY ARE
VALUABLE
MATERIALS THAT
CAN BE USED
NOW AND IN THE
FUTURE.

WEEE recycling – Our reserves are our old toasters, mobiles & Co.

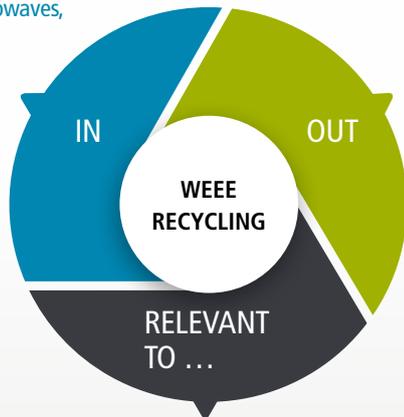
Waste electrical and electronic equipment (WEEE) not only contains valuable materials such as copper, gold and platinum but also pollutants that can harm humans and the environment. It is essential, therefore, that e-waste is handled by professionals – both in industrial nations as well as in the emerging regions around the globe where more and more technology is being used.

WEEE is one of the fastest-growing waste streams worldwide. Forecasts suggest that 49.8m tonnes of old electrical and electronic appliances will be discarded this year – 50% more than in 2010. Raw materials worth billions of euros are hiding in this gigantic mountain of waste electrical and electronic equipment.

Recovering these materials not only preserves their value. It also helps to conserve our planet's natural resources, provides a reliable source of raw materials and reduces consumption of fossil fuels. REMONDIS has been operating WEEE dismantling centres for almost 30 years now. With its high recycling rates, the company recovers glass and plastics as well as ferrous and non-ferrous metals. In many cases, these recycled materials can be used by manufacturers as they are – further treatment processes are not necessary. Other valuable substances are prepared for further treatment so that they can be reused. Pollutants are carefully removed and sent to special treatment or disposal plants. The WEEE and RoHS Directives regulate how e-waste is handled in the EU, whose member states are among the world's biggest producers of waste electrical and electronic equipment. Despite these directives, however, large volumes of European e-waste still slip past the various collection and recycling schemes because they are lying at the back of a drawer, end up in the residual waste bin or are exported illegally. The damage to the EU's economy caused by the improper handling of e-waste is estimated to be between 800 million and 1.7 billion euros.



Large domestic appliances (e.g. washing machines, fridges, display equipment, lamps), small domestic appliances (e.g. vacuum cleaners, microwaves, mobiles, game consoles, electrical tools)



Steel, stainless steel, plastics, copper, aluminium, iron, palladium, silver, glass, wood, lead, tin, brass



75% of all materials in small appliances and display equipment are recovered by REMONDIS

Automobile industry, telecommunications, plastics processors, steel industry, glass processors, bio power plants, construction industry



4.9m tonnes

of copper ore are saved by REMONDIS' WEEE recycling operations every year



REMONDIS Electrorecycling not only uses high tech to recover raw materials and remove pollutants from e-waste, it also offers bespoke collection and take-back schemes. Its core activities here include material flow management, monitoring systems, certificates and documentation – adapted, of course, to meet the individual regulatory requirements of each different country



Its dismantling centres are located in:

- Germany: Lünen, Neumünster, Berlin, Buseck
- France: Troyes
- Poland: Blonie, Lodz
- Austria: Kematen



WEEE recycling – what needs to be done?

The following measures would enable more raw materials to be recovered:

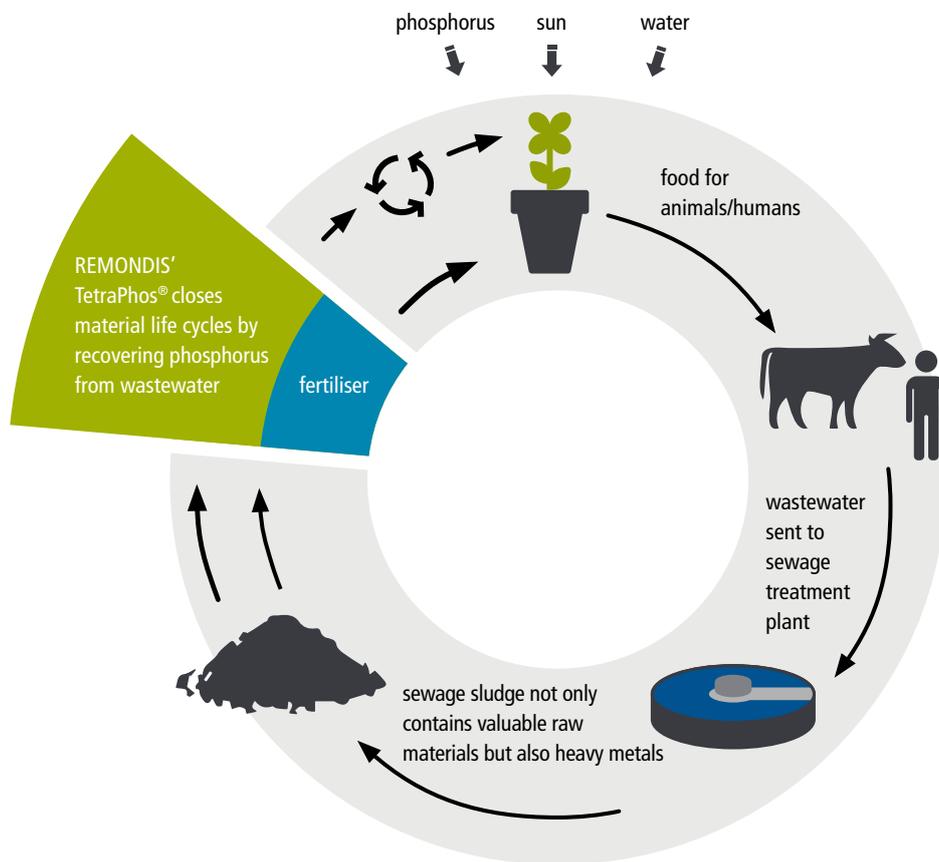
- Making consumers more aware of the need to hand in their old appliances
- Driving progress to enable more materials to be recovered & to improve the quality of the sorted materials
- Ensuring products are designed using recycling-friendly components, compounds & alloys
- Setting ambitious recycling rates
- Harmonising high standards across all EU countries
- Taking more action to stop illegal exports
- Increasing measures to transfer technology & know-how to emerging countries
- Providing support to set up international recycling structures

Recovering phosphorus – No phosphorus means no life

Phosphorus is a nutrient that is vital for all life on Earth. Over the years, it has become more and more difficult to get hold of the supplies needed by the agricultural and industrial sectors – especially as Europe has to import practically all of its requirements. Both the limited availability and the poor quality of the virgin raw material are forcing us to find ways to recover phosphorus so that it can be reused.



Phosphorus is a finite raw material – many countries are dependent on imports, including the whole of Europe



It has been a long while since sewage treatment plants were considered to be simply a waste disposal facility. For many years now, they have been operating as innovative recycling plants – recovering water, energy and minerals.

Thanks to a process developed by REMONDIS itself, the company is now able to recover many different types of marketable recycled raw materials and energy from sewage sludge.

The first stage of REMONDIS' TetraPhos® process involves the sewage sludge being thermally treated in a sewage sludge mono-incineration plant.

The ash is then dissolved in phosphoric acid. The phosphoric acid is enriched with the phosphorus contained in the ash and then processed in a number of different stages. A variety of valuable substances are recovered during the process including the enriched acid and gypsum which is used by the building supplies trade.



TetraPhos® – The advantages of state-of-the-art recycling technology

- Cost effective: when used to treat standard municipal sewage sludge ash, this process does not cause additional costs – on the contrary, it can even lower them.
- Legally compliant: it more than fulfils the rules set out in the amendment to the Federal Sewage Sludge Ordinance [AbfKlärV] which stipulate that 80% of the phosphorus contained in sewage sludge ash must be recovered.
- Environmentally friendly: high quality secondary raw materials are recovered; this reduces CO₂ equivalents (compared to conventional production processes) and ensures the plant has a good ecological footprint.
- Nutrients & pollutants safely separated: the phosphoric acid is a fully marketable and commonly used secondary raw material – there are no restrictions on how it may be used; any harmful heavy metals remain in the residual ash and are sent for professional disposal.

Paper recycling – The best alternative to felling trees

Both households and commercial businesses generate huge volumes of old paper, card and cardboard every single day. These three material streams – simply known as old paper – can be used to make a valuable recycled raw material which is perfect for manufacturing new paper and cardboard products. Systematically using these sustainable recycled paper products not only helps conserve the primary raw material, wood, it also helps protect the environment and combat climate change.

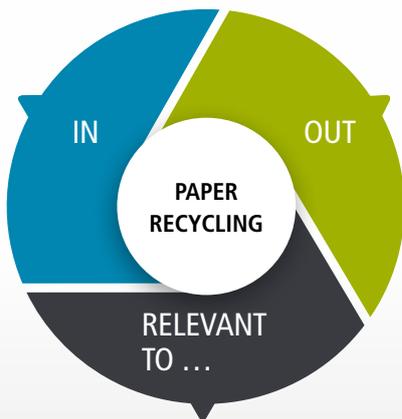
Forests fulfil a vital function all around the world – producing oxygen and reducing greenhouse gases. It is, therefore, simply not sustainable for every one in five trees felled to be used to produce paper.

One alternative to cutting down our forests is to use environmentally friendly recycled paper. Up to 100 percent of recycled paper can be made using old paper, as paper fibres can, on average, be recycled up to six times. Far less energy and water are needed to produce recycled paper compared to the production of paper from fresh pulp. Other benefits: fewer carbon emissions, fewer chemicals and fewer pollutants in the wastewater. These significant ecological and economic advantages have led to old paper becoming the most important raw material for manufacturing paper and cardboard in Germany. The country has a network of sophisticated collection and recycling schemes in place – not least thanks to REMONDIS’ extensive operations in this area. Many other countries, however, have yet to set up the systems needed to enable them to make the most of their old paper.

A comparison of the environmental impact of recycled paper & virgin fibre paper

	Recycled paper (1kg = 1.2kg old paper)	Virgin fibre paper
Wood	–	2.2 to 2.5kg
Water	10 to 20l	30 to 100l
Energy	1 to 3 kWh	3 to 6 kWh
Wastewater pollution (COD)	2 to 5g	5 to 50g

Paper, card, cardboard



Paper & cardboard raw material, sorted and packed according to type

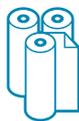
Paper industry as a raw material for making paper & cardboard products



Our network of plants and facilities includes eleven modern paper sorting plants, some of which are able to handle 120,000 tonnes of paper, card and cardboard every year. The company's facilities separate and pack the material into around 100 different categories of old paper



440m tonnes



of paper are expected to be consumed around the world this decade

74.5%



of old paper is used by the German paper industry every year; in 1990, this figure lay at just 48.6%



2.2m tonnes

of old paper are collected and processed by REMONDIS every year – saving around 8 million tonnes of trees

Paper recycling – what needs to be done?

The following measures would enable more raw materials to be recovered:

- Further expanding paper collection schemes
- Encouraging consumers to choose products made with high amounts of old paper
- Systematically increasing the amount of old paper used in paper production
- Creating framework conditions to promote paper recycling & the use of old paper
- Setting high recycling targets for the whole of Europe – sooner rather than later

Plastics recycling – The seven lives of crude oil

In a way, plastic is not much more than hardened crude oil with an incredible range of material properties. It can be soft and flexible or hard and stable; it can be transparent or colourful. And, in the majority of cases, plastic is made from crude oil – a finite substance that is not particularly environmentally friendly to mine or process. Which is why the whole idea of recycling plastic is not an ecological luxury but something that is absolutely vital for both the industrial sector and the environment. And not only since China introduced a ban on imports of plastic waste, forcing Europe to rethink the way it should handle this material.

Anyone who recycles plastic knows that this material reacts in a similar way to paper when it is recycled. Just as the paper fibres get shorter each time they are recycled (determining what they can be used for – from high quality printing paper to toilet paper), so, too, do the hydrocarbon chains get shorter with each recycling process. This factor must also be taken into account when deciding what product groups the recycled plastic can be used for: from high quality injection moulded parts for the automobile and aviation industries, to components for computers and consumer electronics, all the way through to being the source material for containers, bins and garden equipment. Plastic can be recycled around five times before it returns to what crude oil generally is: fuel for generating energy and heat.



8.3bn tonnes

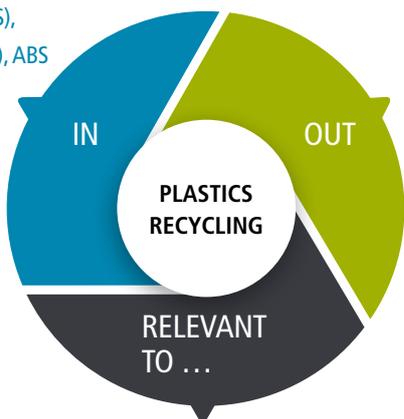
of plastic have been produced to date since production began a good 70 years ago. Over this period, 79% of this plastic has accumulated in landfills or the natural environment. 12% has been incinerated and a mere 9% recycled for reuse. There is clearly a huge potential here for more recycling



1.4m tonnes

of plastic packaging ends up in the German retail sector every year. Germany's new Packaging Law stipulates that the amount of plastic sent for materials recycling must increase from the current rate of 36% to 63% from 2019 onwards

Polypropylene (PP), polyethylene (PE),
polyethylene terephthalate (PET),
polystyrene (PS),
polyamide (PA), ABS



Plastic pellets & raw
materials, sorted and
packed according to type



producing plastic products such as vehicle parts, casing and components for IT / consumer electronics, containers for storing solids / liquids, film, building supplies & garden equipment

RE Plano has specialised in plastics recycling for 60 years now, supplying customers in over 35 countries around the world. Each year, the company produces around 35,000 tonnes of secondary raw materials, 20,000 tonnes of which are plastic pellets. Besides producing high quality granules, plastic compounds, pellets and ground goods, RE Plano also markets production waste which it is unable to recycle in its own facilities. Moreover, REMONDIS PET Recycling GmbH operates the most modern PET bottle recycling plant in Europe. It played a major role in developing a collection and reverse deposit scheme in Germany. Huge counting centres provide data-protected services for manufacturers and retailers



Which means this black gold effectively has seven lives – from being mined and refined, to being reused, on average, five times as a plastic product, to finally being used as fuel. It is even possible to express how plastic recycling helps to curb climate change in concrete figures. One tonne of recycled plastic cuts carbon emissions by up to 1.6 tonnes.

And each tonne that is recycled is not just one tonne less which the industry has to buy as crude oil on the global market – it is also one tonne less of waste plastic in our seas and oceans. These are all excellent arguments for increasing plastics recycling, as REMONDIS has been doing with its company RE Plano for many years now.

Every single tonne of recycled plastic cuts carbon emissions by 1.6t and preserves 2t of crude oil



Plastics recycling – what needs to be done?

What are the opportunities for Europe now that China has banned imports?

- Improving the separate collection schemes for household & commercial waste – also by using educational measures
- Increasing investments in state-of-the-art sorting & recycling technology
- Introducing an obligatory EU-wide Ecodesign Directive that includes material standards
- Introducing a raw material efficiency and recycling label as an environmental traffic light label for consumers
- Creating incentive schemes to encourage the industrial sector to use recycled plastic for manufacturing new products

**WE SHALL
REQUIRE A
SUBSTANTIALLY
NEW MANNER
OF THINKING,
IF MANKIND IS
TO SURVIVE.**

ALBERT EINSTEIN





Metal recycling – Never-ending reserves of top quality materials

Our planet’s raw materials will not last forever. Handling them responsibly is, therefore, one of the greatest challenges of our times. This is particularly true for countries that have few natural resources of their own – countries such as Germany. There is plenty of proof around showing that recycling is key to overcoming this challenge: recovering ferrous and non-ferrous metals for reuse enables industrial businesses to be supplied with recycled raw materials in a conflict-free environment. With absolutely no loss in quality. Again and again and again.

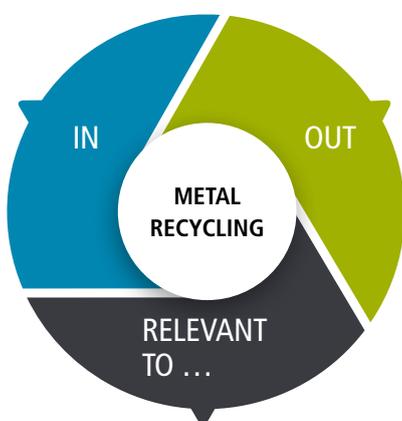
Primary raw materials still tend to be used in industrial production processes even though mining has a hugely negative impact on the environment and far more energy has to be consumed to process them.

Using scrap metal to produce steel considerably reduces energy consumption (compared to primary raw materials) which also means far fewer emissions of CO₂ and other greenhouse gases which are so damaging to our climate. What’s more, systematically recovering, processing and returning metals to production cycles makes businesses less dependent on the primary raw material markets. By combining mechanical shredding processes with computer-controlled separation technology, it is possible to supply high purity recycled metals, prevent downcycling and provide the industrial sector with high quality recycled raw materials. Discussions need to be held with metal processors so that metal life cycles can be closed effectively and sustainably. At the end of the day, it is only possible to offer appropriate recycling solutions and close material cycles if recyclers really understand how products are made and exactly what is needed.

Why? Because recycling begins with product development. TSR Recycling is the leading ferrous and non-ferrous metal recycling business in Europe. The company, which is part of the REMONDIS Group, has over 120 years’ experience of its industry and employs approx. 2,500 employees at 140 locations around the world.

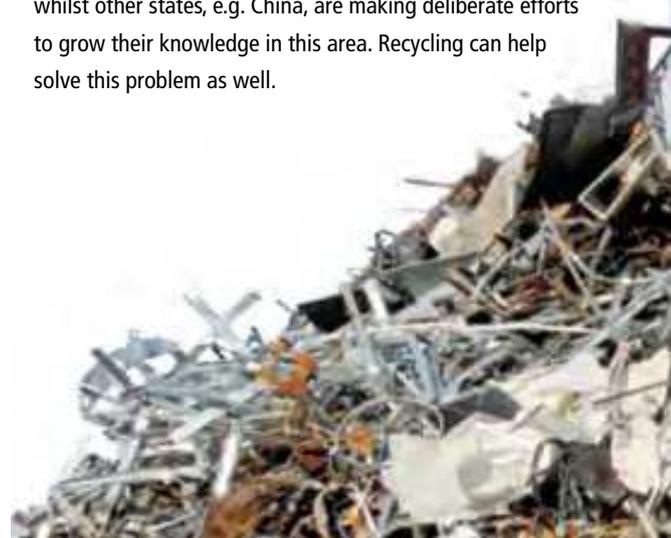
Moreover, it is becoming apparent that key metallurgical know-how is disappearing in countries such as Germany whilst other states, e.g. China, are making deliberate efforts to grow their knowledge in this area. Recycling can help solve this problem as well.

End-of-life vehicles,
new scrap, scrap from
metal processors,
municipal scrap



Steel scrap,
copper, brass,
aluminium

Steelworks, foundries, metal processors



TSR

THE METAL COMPANY

**RAW
MATERIALS
BY REMONDIS**

TSR Recycling's extensive network of business locations stretches across Europe, Russia and China. All in all, it has 140 business locations in Europe

140
locations
in Europe

Metal recycling – what needs to be done?

The following measures would enable more raw materials to be recovered:

- Growing the number of metal collection schemes
- Increasing the amount of metal that is recovered & returned to production cycles
- Carrying out ongoing development work to improve metal recycling solutions & processes
- Promoting an ongoing exchange of information between metal processors and recyclers
- Considering how a product can be recycled during the actual product development stage
- Promoting metal recycling around the world, growing global recycling rates
- Providing technical support to set up recycling structures
- Making it clear just how important metal recycling is for guaranteeing supplies

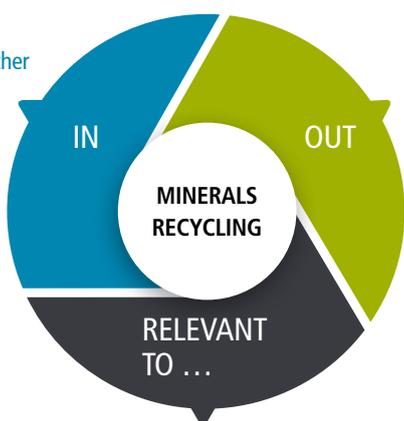


Minerals recycling – The future means smarter building projects

Population growth, the global upturn and the international building boom are all pushing up the demand for mineral raw materials. These materials are needed by the construction industry to build housing as well as to build and maintain infrastructure in general. Recycled and substitute aggregate not only helps here to conserve our planet's natural raw materials. It also plays a major role in reducing land consumption.

According to the experts, the demand in Germany for primary stone/earth raw materials could increase to 650 million tonnes by 2035 – an increase of 20% compared to 2013. Demand in the emerging countries around the world, such as Asia, will grow at a much faster rate. It is, therefore, essential that mineral waste is recycled. Such recycling activities not only ensure we treat our land more responsibly, they also give us access to a reliable supply of vital mineral raw materials. At the same time, land consumption is cut – in two ways, in fact, as mineral recycling reduces the need for mining (and its hugely negative impact on the countryside) as well as the need for landfill space as the material is reused.

Construction waste, ash & slag, earth and other types of mineral waste



Recycled aggregate, substitute aggregate, ferrous & non-ferrous metals

Engineering & construction projects, earthworks & road construction projects



The REMEX Group has over 60 business locations in six countries





850m tonnes

of waste concrete, mortar, bricks, asphalt, sand and gravel are produced by construction and demolition projects across the EU every year

52.3%

of all waste generated in Germany is construction and demolition waste



+ 85%

is the forecasted growth in the volume of construction output around the world by 2030

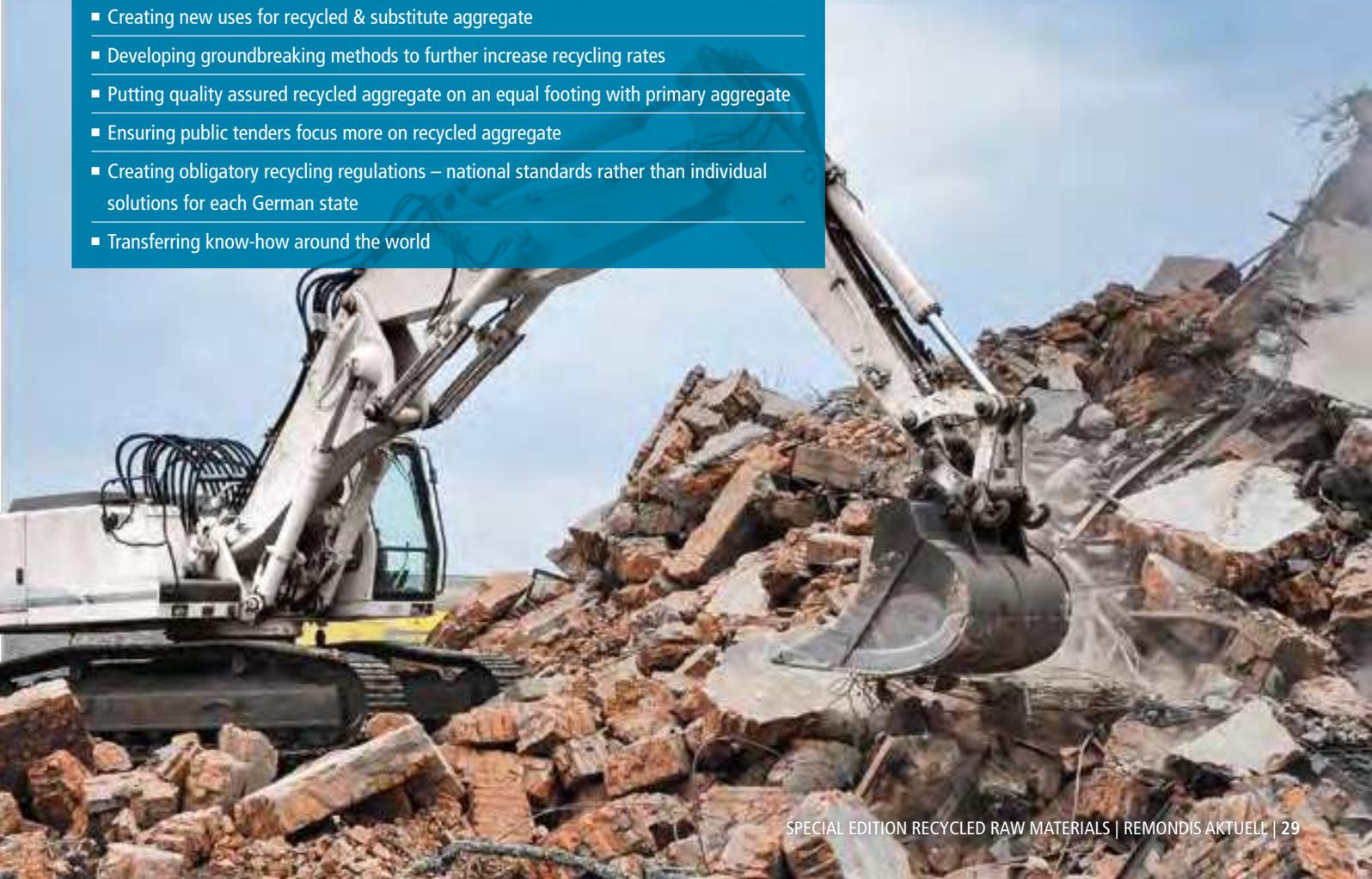
REMONDIS' subsidiary, REMEX, specialises in recycling minerals. It recycles excavated earth and construction waste from road and building work and demolition projects as well as ash and slag from industrial production processes, power stations and waste incineration plants. Thanks to their smart systems, the REMEX facilities are able to produce high quality recycled aggregate as well as quality-assured substitute

aggregate. With their strictly defined chemical and physical properties and stringent quality controls, the company's brand-name products, remexit® and granova®, are suitable for a whole range of applications. What's more, REMEX recovers large quantities of scrap iron and other valuable metals from the mineral waste it processes so that they, too, can be returned to production cycles.

Minerals recycling – what needs to be done?

The following measures would enable more raw materials to be recovered:

- Making people more aware of the fact that supplies of mineral raw materials are finite
- Creating new uses for recycled & substitute aggregate
- Developing groundbreaking methods to further increase recycling rates
- Putting quality assured recycled aggregate on an equal footing with primary aggregate
- Ensuring public tenders focus more on recycled aggregate
- Creating obligatory recycling regulations – national standards rather than individual solutions for each German state
- Transferring know-how around the world





**NATURE'S WAY OF
RECYCLING MEANS
AN END PRODUCT
IS ALSO A STARTING
PRODUCT.**

FREDERIC VESTER, BIOCHEMIST & ENVIRONMENTAL EXPERT





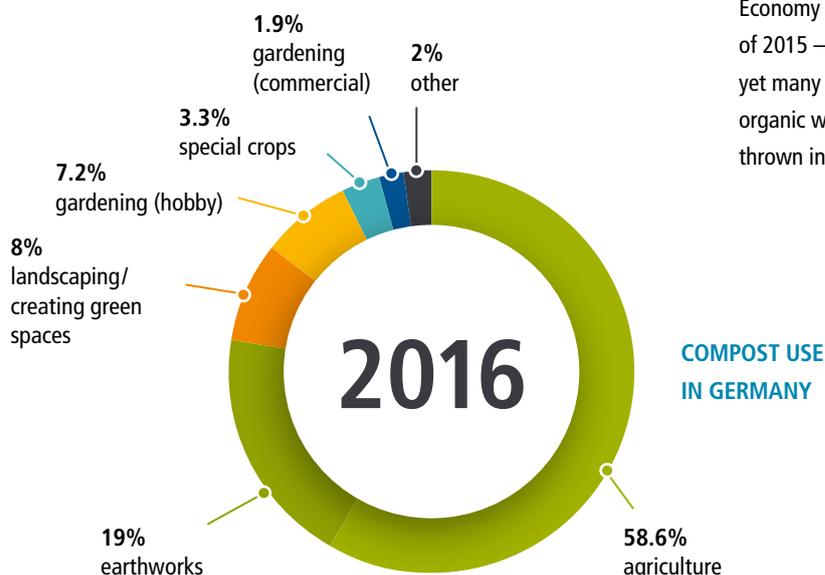
Biomass – Naturally valuable

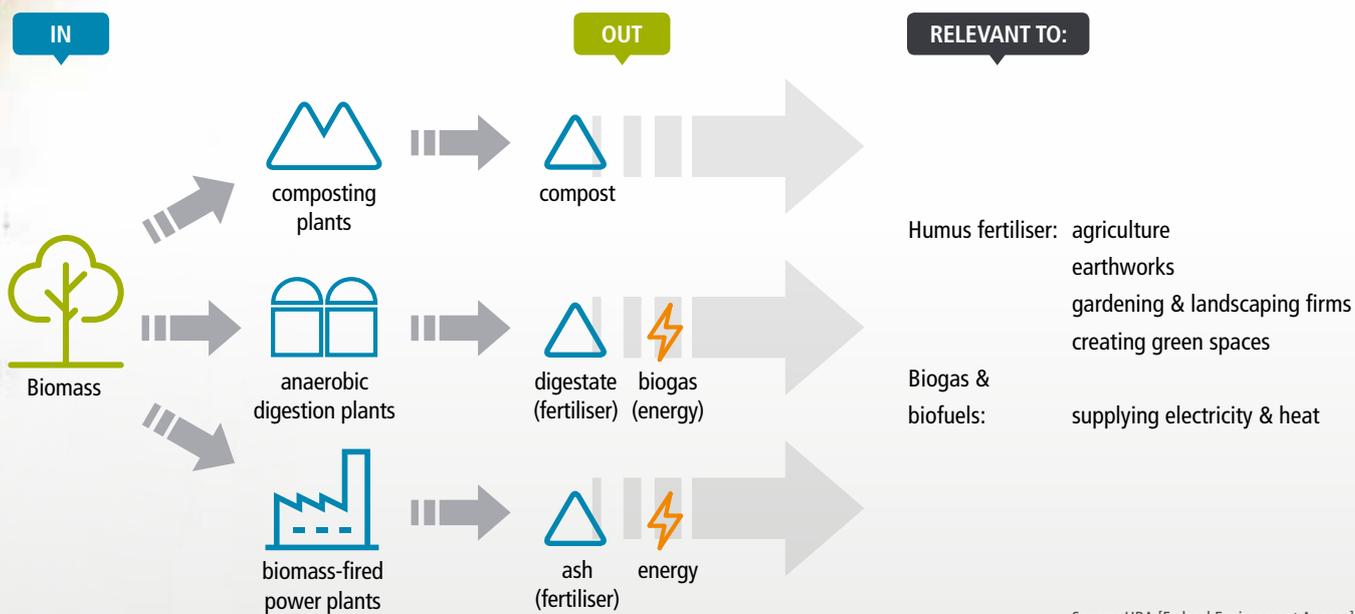
Whether it be kitchen waste, grass cuttings and old wood or organic substances from the wastewater generated by the food industry: biomass has a huge potential to help us and our environment. Systematically recycling these materials provides at least a partial solution to two major challenges faced by society – feeding our world’s growing population and supplying them with environmentally friendly electricity and heat.

Whilst the number of people needing to be fed around the world is growing all the time, the conditions for supplying them with food are slowly deteriorating. More people mean more housing and more housing means fewer fields for growing crops. What’s more, climate change is also likely to reduce the amount of good agricultural land available to us. The farmers’ response has been to try and achieve higher yields on smaller areas – also by maintaining and improving the quality of their soil.

REMONDIS transforms biomass into top quality products with a high nutrient content including composts, fertilisers, substrates and mulch. They improve the quality and the structure of the soil and regulate water flow. Furthermore, the company uses biomass to generate climate-neutral energy. The biomethane produced in its biogas plants is either fed into the natural gas network or used to produce electricity and heat. What’s more, it could be used as a fuel for collection vehicles that empty, for example, organic waste bins. Wood-based biofuels are turned into energy and heat in biomass-fired power plants. Using such materials to generate energy reduces our consumption of our planet’s finite fossil fuels and cuts carbon emissions – helping to curb climate change.

The whole question of the sustainable benefits of recycling biomass is uncontroversial. Processes for recycling organic materials are well established and provide a reliable supply of marketable products. Having said that, however, the potential of this material is not being fully exploited in Germany. Just one example – household organic waste: the German Circular Economy Law [KrWG] stipulates that – as from the beginning of 2015 – this waste stream must be collected separately. And yet many households around Germany still do not have an organic waste bin. Huge volumes of biomass continue to be thrown into the residual waste bin.





Source: UBA [Federal Environment Agency],
Biowaste, 2016

RAW MATERIALS BY REMONDIS

REMONDIS operates its own biomass recycling plants or helps others to run such facilities at 46 different locations across Germany. The company can also be found abroad – operating five plants in the Netherlands, four in Poland and three in Australia. It produces 800,000 tonnes alone of high quality compost products (sold under its HUMERRA® brand) every year.



Biomass – what needs to be done?

The following measures would enable more raw materials to be recovered:

- Taking steps to ensure the law – i.e. biowaste must be collected separately – is actually enforced
- Providing all households with organic waste bins to make sure biowaste is collected all across the country
- Publishing information regularly about the advantages of sorting/collecting organic materials separately from other waste streams
- Aspiring to reduce levels of “contamination” in organic waste collections to 1 percent by weight
- Putting compost and/or digestate products on an equal footing with primary products and manure
- Giving certified composts legal product status
- Fertiliser Ordinance: strengthening the position of composts as a sustainable soil improver

Waste to energy – Every little bit helps

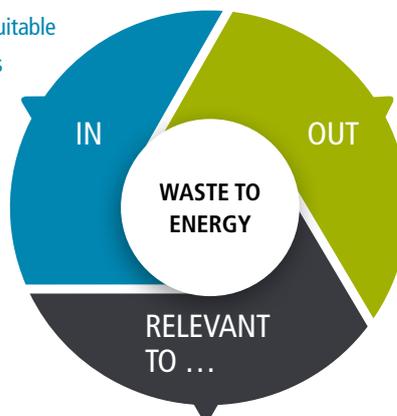
No matter how extensive the know-how and how modern the technology, there are still some substances that cannot be recycled for reuse. These also include substances and raw materials which were not designed to be recycled. These materials can be treated in a different way: namely to generate energy. The electricity, heat and process steam produced from non-recyclable waste are available 365 days a year, no matter what the weather – and such operations also make good environmental sense.

Demand for energy is growing all around the world. Our planet's supplies of fossil fuels will not, however, last forever. Generating energy from waste reduces our consumption of natural gas, crude oil and coal. Indeed, waste to energy is considered to be just as important as materials recycling when it comes to some types of hazardous industrial waste. The by-products of all thermal treatment operations contain components that can be recycled and reused. Metals can be recovered from the ash and gypsum from the filter dust; the slag can be used as substitute aggregate – all of which help conserve our supplies of primary raw materials.

Recycling sewage sludge to produce energy is a further way of combating climate change and conserving natural resources. Dried sludge is a good substitute for fossil fuels such as brown coal or natural gas. What's more, sewage sludge ash contains high levels of phosphorus which REMONDIS is able to recover with its patented processes (see pp. 18/19).



Waste not suitable for materials recycling



Energy, ferrous & non-ferrous metals, recycled aggregate, gypsum, phosphorus (sewage sludge)

Energy suppliers, metal processors, construction sector, agriculture



+ 30%

growth in global energy needs by 2040; this rise is the equivalent of China and India's current requirements

20m MWh

of energy is produced by the German municipal waste incineration plants every year

Looking around the globe, though, there are still many regions that do not have suitable plants for transforming waste into energy. In fact, there are some that do not even have an infrastructure in place for handling hazardous waste safely. International cooperation work is needed here to keep the people and their environment safe – for example by removing hazardous materials from illegal dumping sites

so they can be properly disposed of using state-of-the-art technology. Or by transporting the materials to facilities which have the technological know-how, set-up and experience to deal with them. At the end of the day, we all share the same biosphere and hazardous situations and events should not be tolerated no matter how far away they may be from us.



REMONDIS has a share in a number of municipal waste incineration plants across Germany which provide their respective regions with energy. The company transforms industrial waste which is unsuitable for materials recycling into alternative fuels with a defined calorific value. What's more, it operates waste-to-energy incineration plants for treating hazardous materials – such as SAVA in Brunsbüttel. This plant is one of the most modern and most environmentally friendly of its kind in Europe. The REMONDIS Group is also helping to drive forward waste-to-energy operations abroad, e.g. in Singapore.



REMONDIS®

WORKING FOR THE FUTURE

Waste to energy – what needs to be done?

The following measures would enable more raw materials to be recovered:

- Ensuring that non-recyclable waste is used to generate energy
- Providing financial & operational support to set up waste-to-energy plants
- Driving forward innovations to further improve efficiency levels & energy efficiency
- Extending viable pre-treatment methods
- Campaigning for a global landfill ban
- Getting the most efficient plants to provide international help & protect our global environment
- Accepting hazardous substances from abroad if the countries, in which they are produced, do not have environmentally compatible systems to dispose of them



REMONDIS IS
PERMANENTLY
INVESTING IN NEW
TECHNOLOGY.
**THIS IS OUR
CONTRIBUTION
TO THE FUTURE.**

LUDGER RETHMANN



Recovering raw materials at the Lippe Plant

THE SITE PRODUCES JUST UNDER 500,000T OF RAW MATERIALS EVERY YEAR

REMONDIS®

WORKING FOR THE FUTURE

Many people underestimate what can actually be achieved with recycling. What's more, we often don't know the specifics – for example which substances the recycling industry can recover and what can actually be done with them. Taking a look behind the scenes can help them to find out more.



With 14 different plants and facilities spread over more than 230 hectares, the Lippe Plant in the Westphalian town of Lünen has created its very own 'world of recycling'. Thanks to its links to a wide range of industries and sectors, REMONDIS is able to transform waste from various areas of production into recycled raw materials and products at this site – the largest industrial recycling centre in Europe. Even more unusual types of waste, such as gypsum from flue gas desulphurisation plants at coal-fired power stations or alkalis from catalyst producers, are able to be processed and returned to production cycles. The Lippe Plant has also been honoured by KlimaExpo, an initiative set up by the German state of North Rhine-Westphalia, which has praised the work being carried out at the site – both in its three main areas of recycling and its contribution to combating climate change as it cuts carbon emissions by 488,000t every single year.

On the one hand, REMONDIS makes the most of industrial waste to create primary products for industrial businesses: waste plastic is processed into pellets, slag into metal. Furthermore, sodium aluminate is recovered so it can be used for treating wastewater or to make binding agents and white minerals. Other facilities recover high-energy fats from high-risk animal by-products and then turn these into carbon-neutral biodiesel. Not only industrial businesses benefit from the wide variety of recycling activities at the Lippe Plant but the agricultural sector as well: organic and green waste is used to produce high quality composts which can be ordered straight from the recycler. Non-recyclable waste is used as an alternative fuel to generate energy. Carbon-neutral electricity is, for example, produced at the Lippe Plant's own biomass-fired power station, a collaboration with STEAG.



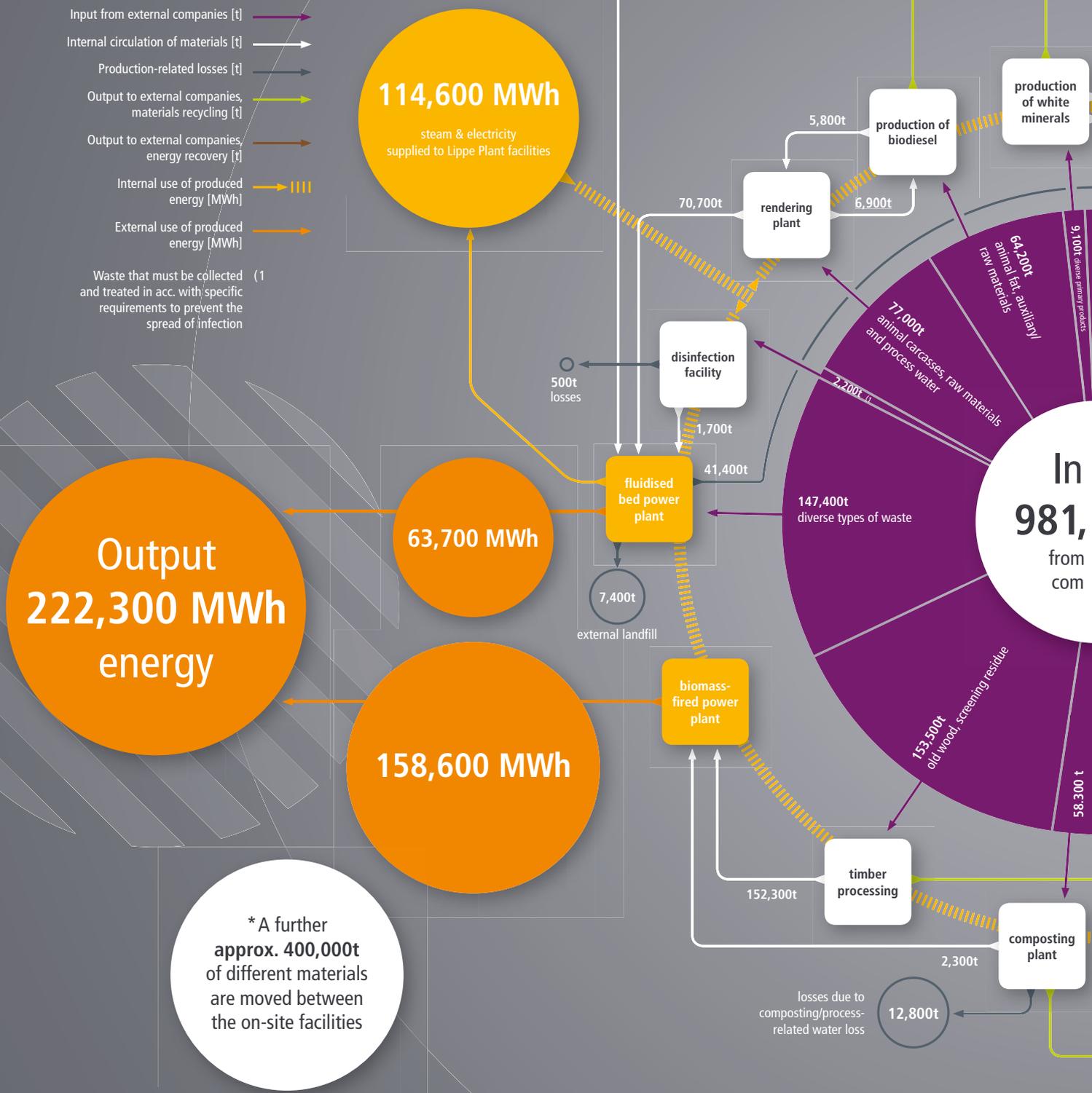
You can now visit the Lippe Plant online. Take a look at our new Lippe Plant website and learn more about the site's wide range of recycling activities



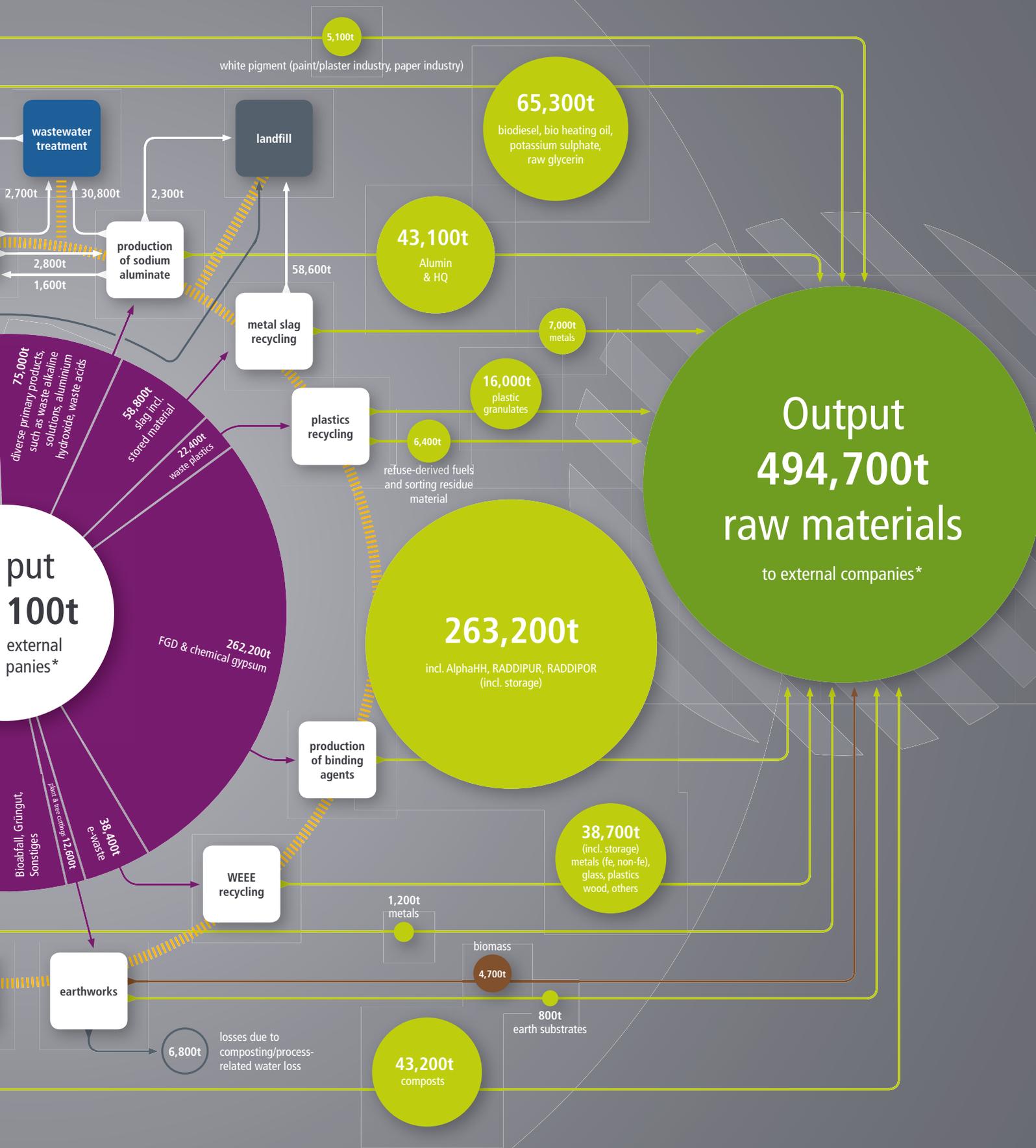
The Lippe Plant – Services & Products

- Input from external companies [t]
- Internal circulation of materials [t]
- Production-related losses [t]
- Output to external companies, materials recycling [t]
- Output to external companies, energy recovery [t]
- Internal use of produced energy [MWh]
- External use of produced energy [MWh]

Waste that must be collected and treated in acc. with specific requirements to prevent the spread of infection (1)



*A further approx. 400,000t of different materials are moved between the on-site facilities



Recovering raw materials at the Bramsche Industrial Recycling Centre

RESPRAY AND RENOTHERM DELIVER LARGE VOLUMES OF ENERGY AND RESOURCES

Special levels of expertise are needed to manage hazardous waste. The staff most qualified to handle such substances at REMONDIS can be found at the Bramsche Industrial Recycling Centre. Hazardous waste and recycling are most certainly not a contradiction in terms here. The centre's mission, as across the whole of the company, is to do everything possible to protect the environment and curb climate change – something that is particularly well illustrated by the two products, RESPRAY and RENOTHERM.

RESPRAY is a full-service system that ensures old aerosol cans – a product that is officially listed as hazardous waste across the whole of Europe – are collected, transported and recycled safely. Operating its business in line with its motto

“turning old cans into something new”, the recycling centre in Bramsche recovers all reusable materials from the aerosol cans. The facility, which was built specifically for RESPRAY, sorts the aerosols, removes any pollutants and then compacts the cans in an inert environment.

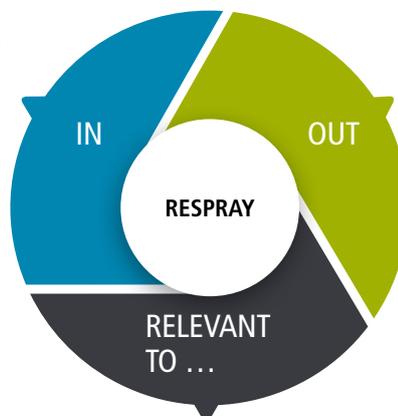
This method enables three different material streams to be separated and recovered:

- The propellants are turned into liquid and used as an alternative source of energy
- The liquids are thermally treated to generate energy
- Aluminium and tinplate are recycled so they can be reused

REMONDIS' RESPRAY process was among the final four nominees for the 2017 GreenTec Award, Europe's most prestigious environmental prize.



All types of empty and partially full aerosol cans, PU foam containers, lighters & refill bottles

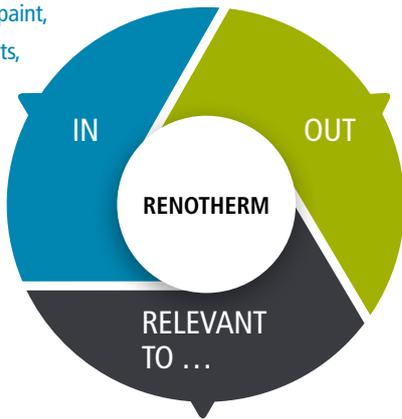


Propellants, liquids, aluminium, tinplate

Aluminium & tinplate processors, producing energy



Distillation residue,
residual resin, paint,
varnish, sealants,
glues etc



Solid & liquid RDF

Especially for use in cement works,
power stations & other large industrial furnaces

The individual properties of RENOTHERM® are precisely defined – this applies both to calorific value as well as specific characteristics, such as grain size and chemical properties

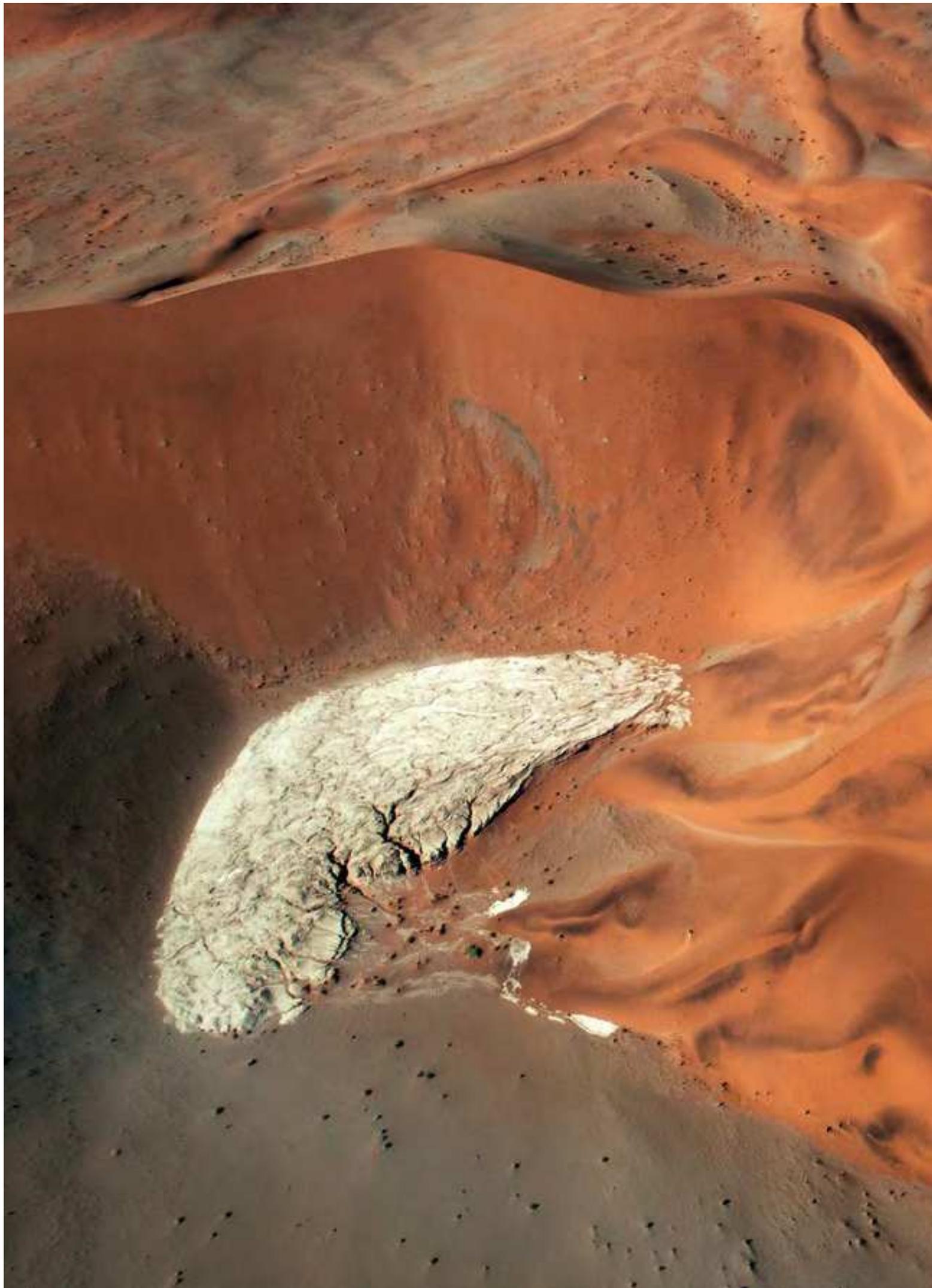
 **RENOTHERM®**

Coal, gas and oil are, of course, fossil fuels. As supplies of these raw materials are getting increasingly scarce, REMONDIS' Bramsche centre produces high quality RDF (refuse-derived fuel) from non-recyclable waste which it then sells under its RENOTHERM® brand. Not every type of waste can or is allowed to be recycled for reuse. By taking these materials and transforming them into RDF, REMONDIS Industrie Service is helping to sustainably protect our planet's supplies of coal, gas and oil. Incinerating

non-recyclable materials to generate energy, therefore, protects our environment and helps conserve global reserves of raw materials. Examples of non-recyclable waste include distillation and resin residue as well as old paints.

Thanks to REMONDIS Industrie Service, the very most is made of hazardous waste – ensuring these material life cycles are extended for as long as possible.

- Over the last 10 years, the Bramsche recycling centre has produced more than 200,000t of the RDF, RENOTHERM®.
- Ca. 92% of the input material is sent as RENOTHERM® RDF to cement works and industrial power plants for thermal treatment.
- Ca. 7% of the input material is ferrous metals which are recovered for reuse (metal recycling).
- Ca. 1% of the input material is non-recyclable pollutants (landfill or WIP).
- 30–35% of the RENOTHERM® fuel is biogenic content.
- Looking at the emissions trading scheme, these facts are extremely important for energy-intensive businesses (compared to fossil fuels).



THE ESSENCE
OF SYSTEMATIC
THINKING IS
RECOGNISING
THAT WE **MUST**
MOVE AWAY
FROM LINEAR
THINKING.

PAUL WATZLAWICK



Closing the loop

THREE APPROACHES FOR MORE
RECYCLED RAW MATERIALS

Politicians need to create positive incentives to encourage manufacturers to use more recycled raw materials



It is only natural for a person to look at their life as being linear – from its beginning, to its end. What we imagine may have come before or may happen afterwards is a spiritual question or a matter of one's beliefs. This linear approach, however, is increasingly becoming a problem when it comes to production and consumption. Looking at how the world's population is growing – and, as a consequence, how consumption is increasing and supplies of raw materials are shrinking – there really is only one solution for the future: to have a genuine closed loop economy. All products and raw materials must be systematically recovered and reused in the future. If we don't do this, we will find ourselves facing an increasing number of catastrophic environmental problems and economic upheavals as well as armed conflicts as countries seek access to raw materials. Three specific measures are needed to turn our linear system into a closed loop economy and prevent such a dire outcome.

1. Ecodesign Directive

The EU's Ecodesign Directive primarily focuses on energy efficiency levels of household appliances and other consumer goods. It has set out specific requirements for products by looking at the values that can be measured and then setting limits for these. Examples here include requirements regarding

- energy efficiency: by setting limit values for the performance of certain functions (in watts) for example as an energy efficiency index, efficiency or usage rate
- certain pollutants: by setting emission limit values
- performance capability: by setting e.g. a minimum lifespan for light bulbs

At the same time, the Directive stipulates what product information manufacturers must pass on to consumers (on product labels, product information sheets and on the internet).

Raw material efficiency has so far been ignored

If the challenges of a modern recycling economy are to be met, it is essential that all aspects of raw material efficiency are also included in the Ecodesign Directive.

- All products must be developed and designed so that preferably all of the raw materials contained in a product can be recovered and recycled when it reaches the end of its useful life.
- The information provided with the product must include a recycling efficiency label similar to the colour bar charts used for energy efficiency levels. Consumers should be able to see straight away how easily the product can be recycled and what percentage of its contents are made of recycled raw materials.
- Higher priority must be given to raw material efficiency than energy efficiency because the growing scarcity of raw materials is a much bigger problem than the scarcity of energy.



More money needs to be invested across Europe to improve both sorting processes and the quality of recycled materials

2. Improving the quality of sorted and recycled products

The wake-up call came from China at the beginning of 2018. The Environment Ministry in Beijing had forewarned the World Trade Organisation back in 2017 that it was intending to gradually introduce a ban on imports of 24 different types of unsorted waste (including plastic waste, WEEE and even old paper) from the beginning of 2018. China's decision to take this step is forcing politicians and businesses across Europe and other parts of the world to act.

Germany alone has already shipped 1.5 million tonnes of plastic waste to China over the years – more than half of the total volume generated in Germany. At the same time, German politicians have set the course for more materials recycling. The current materials recycling rate for plastic waste lies at 36% and this should have increased to 63% by 2022. Furthermore, the European Union is working on a new circular economy package that should considerably raise material recycling rates across all member states.

Both Germany and Europe need to invest more money in their sorting and recycling processes to improve the quality of the raw materials they recover. This is the only way for recycled raw materials to become an attractive alternative for manufacturers – both from point of view of price and quality. Public authorities should also move this issue forward by promoting green purchasing in their tenders (Green Public Procurement). It will also reduce economic and political dependency on the countries extracting and exporting the so-called primary raw materials. REMONDIS is already investing in new sorting and recycling facilities. In 2018, for example, it will be commissioning a new composting plant with a biogas production facility and additional extruder lines for producing plastic pellets as well as plastic film from recycled film at its Lippe Plant in the German city of Lünen – Europe's largest industrial recycling centre (see p. 38).

From a raw material to a recycled material

A raw material is extracted from nature



The raw material undergoes initial treatment



The raw material is processed & turned into a product



The product is sold on the wholesale/retail market



The product is used by industrial businesses/ private individuals



The raw materials are recovered from the product and recycled



The product ends up in the bin at the end of its useful life



*The best possible ecodesign combines maximum recyclability with the greatest possible use of recycled raw materials and the lowest possible consumption of energy

3. Encouraging manufacturers to use recycled materials

"It makes sense to look at the amount of resources needed to manufacture a product and then weigh this against the actual benefits of the product." This was a comment made in the BDI's [The Federation of German Industries] publication, "Fact check: raw material efficiency". As a general rule, it is not possible to simply reduce the volumes of raw materials needed in production processes as these depend on the product's future application, levels of technical development and regulatory standards.

Global exports make up 46% of all sales generated by the German industrial sector. At the same time, almost 86% of the raw materials they need to manufacture their products have to be imported from abroad. A mere 14% of their raw material requirements currently come from the recycling sector. There is, therefore, a great opportunity here to create a genuine win-win situation. Using high quality recycled materials sourced from local volumes of waste would make it easier for manufacturers to get hold of the supplies they need and reduce their dependency on the volatile international raw material markets.

Having said this, however, producers are still reluctant to use recycled raw materials – a reluctance that is difficult to understand considering the fact that such materials are superior to their primary counterparts in so many different ways (see pp. 8/9).

Politicians need to introduce incentive schemes to ensure more recycled materials are used in the future and, as a result, strengthen the local market for sustainable recycled substances. Various different approaches are possible here. One way, the BDI writes, could be to impose taxes on the use of raw materials but this might put local companies at a disadvantage (as foreign businesses would have a greater competitive edge) and force German firms to move their production operations abroad. It is also unlikely that this would have a positive impact on global resource efficiency. The opposite approach – reducing taxes for industrial businesses that use recycled raw materials from European sources – could indeed act as an incentive and also increase their competitive position. Strengthening take-back schemes, licence fees and other control instruments are other possibilities. No matter which route politicians decide to take, one side-effect of promoting recycled raw materials will be to strengthen the European waste management and recycling industry – an industry that already provides 250,000 jobs in Germany alone and is one of the biggest drivers of growth in Europe today.



The recycling label – Just how green am I really?

TRAFFIC LIGHT LABEL SHOULD PROTECT CONSUMERS FROM SUPPOSEDLY ENVIRONMENTALLY FRIENDLY PRODUCTS

The business world and politicians need to change the current situation so that consumers are able to choose products that genuinely are environmentally friendly. The 'Blue Angel' certification was certainly a good step in the right direction but is not enough to really promote resource conservation.

The idea

Ideally, consumers should be able to recognise immediately just how green the product they are interested in actually is and to what extent it can be recycled. A recycling label with a simple colour code (similar to the well-known energy efficiency label for electrical appliances) could promote more environmentally friendly consumer behaviour. Manufacturers would be encouraged to follow the strict ecodesign regulations and use recycled raw materials.

Consumers know exactly what the colours red, amber and green mean. They would recognise immediately how environmentally-friendly or unfriendly products are. The next step must then be to allow consumers to access full information about how sustainable the product actually is.

1. How long is the product's service life, functionality & useful life?
2. What resources were used to make the product?
3. To what extent can the product be recycled?
4. What is its carbon footprint?

An intelligent use of resources, a high degree of recyclability and low carbon emissions are three of the factors that determine just how green a product really is

A special registration agency or product labelling agency would have to be set up to ensure that such a label was both reliable and credible. All products sold on the EU market should then be checked to make sure they are what they claim to be.

What the recycling industry expects this label to achieve

The industry's response to the call for greater energy efficiency has been to reduce the weight and volume of their products. To be able to achieve this, however, they have had to mix, fuse or stick raw materials together. The result: it is often no longer possible for recycling businesses to separate the composite materials from each other. The only option available is to incinerate the products to generate energy. The raw materials are lost to us forever.

Both resource efficiency and the recyclability of a product play a decisive role in countries, such as Germany, that have so few natural resources of their own – impacting on society, industry and the economy. Consumers are dependent on the availability of raw materials for their products but they can exert influence as well. Their consumer behaviour affects both companies and politicians. An action that should be encouraged to help combat climate change, protect the environment and ensure local businesses remain competitive over the long term. Each and every consumer should be given this opportunity.

Green Public Procurement (GPP)

PUBLIC PROCUREMENT FOR A LOW-CARBON ECONOMY

The GPP 2020 project aims to considerably increase awareness of green public procurement across Europe in order to help ensure the EU's 2020 goals are reached: a 20% reduction in greenhouse gas emissions, a 20% increase in the share of renewable energy and a 20% increase in energy efficiency.

As the name suggests, green public tenders focus on both reducing energy consumption and cutting carbon emissions. Special software has been created to help local authorities implement such tenders and training courses are also available to teach users about the software's different tools. Initial calculations show the decision-makers and procurers what savings can be achieved with an environmentally friendly tender. Thanks to this project, more than 100 low-carbon tenders have already been implemented in the eight participating countries – all of which have had an immediate impact: carbon emissions have been reduced by 922,000 tonnes and energy consumption by 1,800 MWh.

An opportunity for every local authority

The GPP 2020 project has made it very clear that this is a simple way for both central and local government to lead by example. They can choose to promote efforts to protect the environment and curb climate change

without having to depend on laws or on industry having to undergo change. When it comes to achieving the EU's 2020 goals, the most important feature of a public tender must no longer be the price. By setting clear requirements (such as to what extent carbon emissions and/or energy consumption should be cut), local authorities can send a clear signal and provide industry with an incentive to run a low-carbon business without having to draw up new rules and regulations. These principles have not yet been taken up by all member states, but – as far as the recycling sector is concerned – they are something that every local authority should strive towards.



100 low-carbon tenders have already been implemented, reducing CO₂ emissions by 922,000 tonnes





Recycled raw materials are better than raw materials

The best choice for our future: recycled raw materials are not only raw materials, they are often much better than those from primary sources. Why? Because they are of an excellent quality, require less energy and space to produce, are carbon neutral and can be found here on our home market. Recycled raw materials help grow our economy and ensure we continue to have a world worth living in.