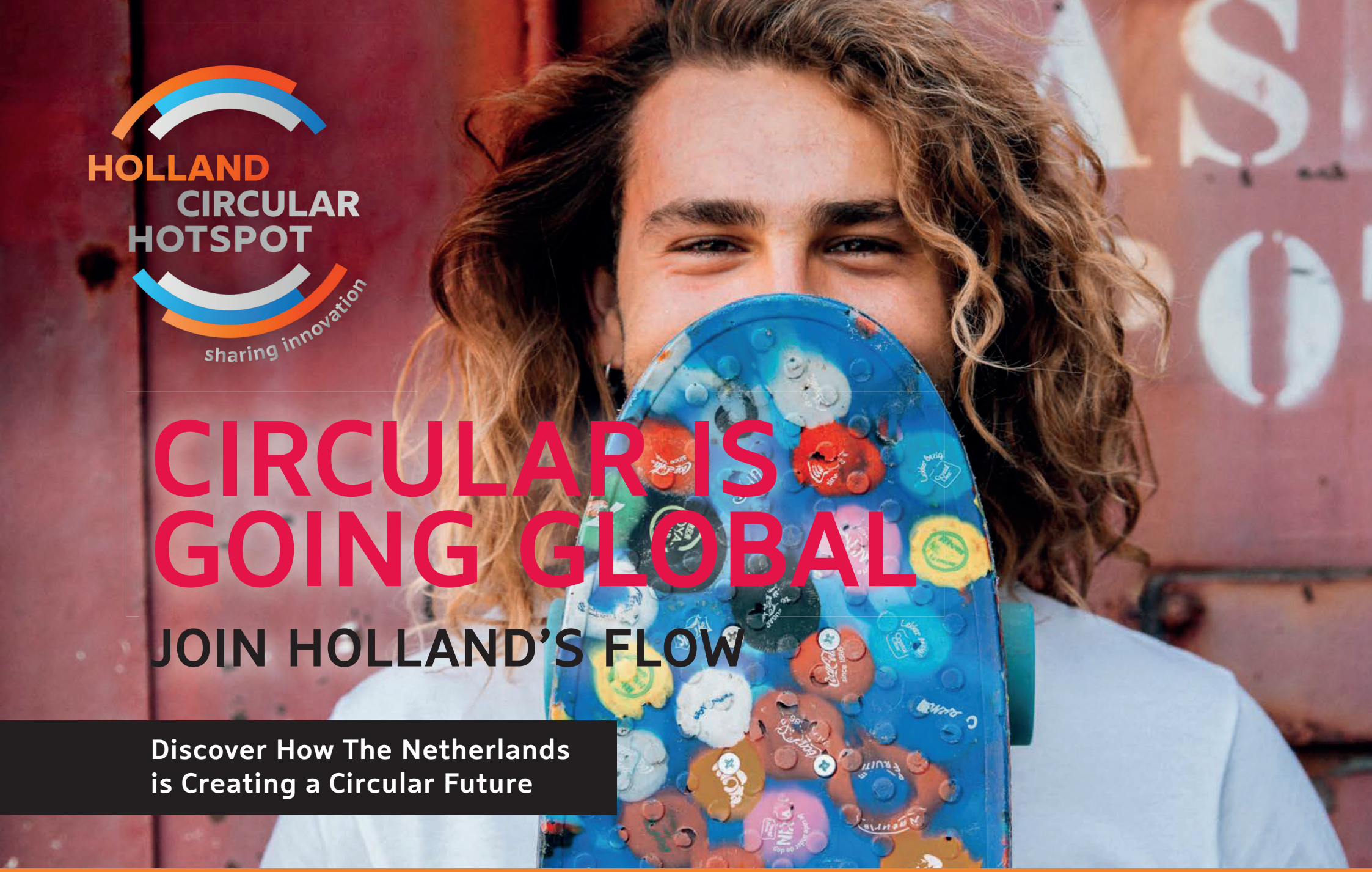


HOLLAND CIRCULAR HOTSPOT

sharing innovation

CIRCULAR IS GOING GLOBAL

JOIN HOLLAND'S FLOW

Discover How The Netherlands is Creating a Circular Future

Holland.

Holland Circular Hotspot inspires the international exchange of Circular Economy knowledge and innovation.

Join Holland's flow in creating a circular economy

In the Netherlands, we realise the importance of making our economy more sustainable. We are embracing the challenge to protect our limited space and resources by reducing, reusing and recycling all that we make and use. Through a circular perspective, we are rethinking the way our economy works – designing products that are 'made to be made again' and powering the system with renewable energy. With creativity and innovation, we are building a restorative economy.

The government of the Netherlands has initiated a government-wide programme for developing a circular economy by 2050. Its ambition is to realise a milestone of a 50 percent reduction in the use of primary raw materials by 2030. The Netherlands considers this to be crucial for economic growth and, moreover, it will improve the well-being of society as a whole. This is what makes a circular economy so vital.

The Netherlands is becoming a living lab, generating and dissipating information on the transformation to a future-proof world. To that effort, Holland wants to share with the world its innovations along with its desire to encourage greater participation in the circular economy. Just as many countries around the world are sharing the sense of urgency to live and work more sustainably.

As you flip through the pages of this magazine you will see just a few of the many innovative and inspiring examples of how Holland is contributing to a circular world. Let's join together to create a circular future that goes beyond borders. Join Holland's flow!

About Holland Circular Hotspot

Holland Circular Hotspot (HCH) is a multi-stakeholder organisation where business, knowledge institutions and (local) governments work together with the aim to boost circular knowledge, business opportunities and cooperation worldwide. We, the Holland Circular Hotspot team, are looking forward to welcoming you at our website www.hollandcircularhotspot.nl.

Mission and goals

HCH's mission is to contribute to the achievement of the Sustainable Development Goals (SDG's) by supporting the implementation of circular economy initiatives in the international environment. We bring together people, planet and profit.

HCH wants to contribute by supporting, linking and exchanging international cooperation, knowledge and best practices in relation to the Circular Economy with the aim of:

- creating CE business opportunities for Dutch and foreign companies;
- achieving international exchange of CE knowledge and innovation.

To accomplish this we showcase CE innovations and best practices, facilitate cross-over cooperation by organising networking meetings, events and missions from/to several countries worldwide, deliver keynote speakers, share information on financing and business opportunities and events, etc.

Activities

The activities of HCH are:

- to stimulate cooperation between the private sector, knowledge institutions, governments and other relevant parties;
- to provide international visibility of Dutch CE innovations/best practices;
- to assist foreign parties in linking with relevant Dutch CE parties;
- to facilitate access to Dutch and international (financing) instruments and programmes.

Get in touch:
info@hollandcircularhotspot.nl

Auping managed to cut down their energy usage: gas by 90% and electricity by 45%.

Auping

Circular mattresses with ambition

Dutch bed manufacturer Auping is considered to be one of the leaders in circular economy in the Netherlands.

The company's goal is to have a production process where every fibre gets reused. Every used mattress will be returned to the factory and ultimately be recycled into new mattresses.

Auping adapted the Cradle-to-Cradle system, focusing on 3 principles:

1. products are manufactured from 100% reusable materials
2. it uses sustainable energy and any usage of fossil sourced energy is kept to a minimum
3. employee wellbeing is important, Auping strives to be a good employer and a transparent partner for other companies

Sustainability every step of the way

In addition to Auping's attention to circular economy, the company also looks at the sustainability of their manufacturing process and products. Their bed frames are painted with a water-based varnish. The manufacturer has saved 120,000 transport kilometres per year by centralizing their production plant in the Dutch city of Deventer. They start the manufacturing process only when they receive an order from the customer, instead of producing the beds and mattresses in bulk and storing them in warehouses.

The Deventer plant uses the smart industry scheme. It has a wood plant to produce bed frames, a steel factory to make mesh bases and a stitching workshop for their mattresses and boxsprings. Centralizing everything not only keeps the kilometres in transportation to a minimum, but it also integrates the various manufacturing processes. In addition to the aforementioned, it stimulates the involvement of the employees.

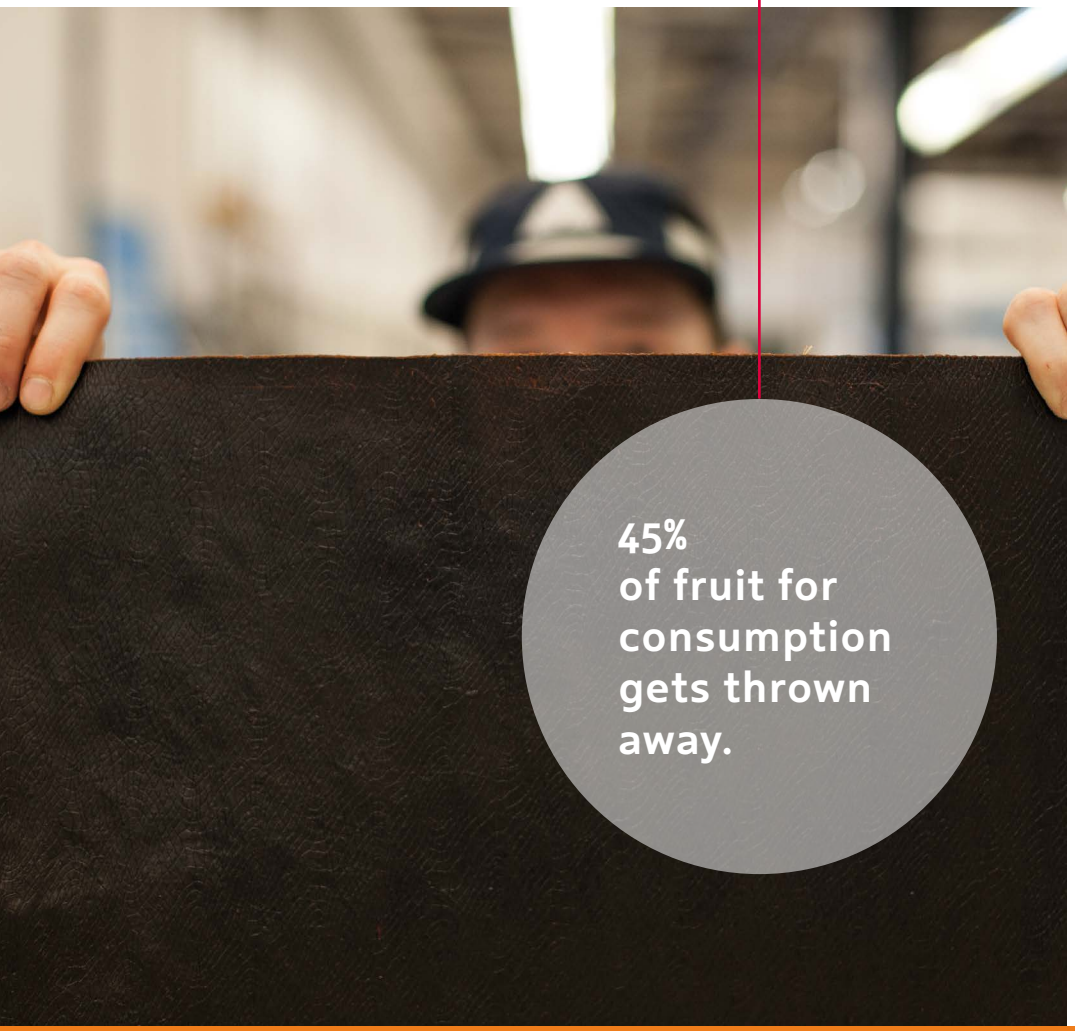
By integrating all these steps, Auping managed to cut down their energy usage: gas usage by 90% and electricity by 45%.

Take back system

In recent years Auping introduced the 'Take Back System'. The initiative involves taking back the customer's old mattress when they buy a new one. Auping recycles the old mattresses and turns them into wall insolation and judo mats. These mattresses will not end up in the ovens, unlike the other 1,2 million annually.

In the future, Auping wants to develop a lease scheme. Companies or individuals can lease a mattress and trade them in for a new one when the mattresses reaches the end of its lifecycle.

www.auping.com



Fruitleather

Leather from fruit

Fruitleather Rotterdam believes that fruit has much to offer, especially imperfect or decaying fruit. It believes this neglected fruit, on average, provides more possibilities than we think. The Rotterdam-based company is developing a new, environmentally-friendly manufacturing process that converts discarded fruit into sustainable, leather-like material.

Discarded fruit as a starting point

Worldwide, throwing away food is a big problem. Some 30% of the world's agricultural land is used to produce 1.3 trillion tonnes of food that is not consumed. Of all the fruit that is produced for consumption, 45% gets thrown away. Confronted with fruit waste at the Rotterdam market, the people at Fruitleather Rotterdam throught they could make a difference. They arranged to pick up the fruit from market merchants and started developing a new eco-friendly process that converts leftover fruits into a durable leather-like material. These days they are collecting fruit from fruit importers throughout Holland, so they are assured of an abundant supply of diverse sorts of discarded fruit. In effect, they're creating value to what was once considered to be a worthless product.

Eco-friendly production

Fruitleather transforms the discarded fruit into sheets of leather-like material. In order to get a real leather look, a final finishing is applied. The Fruitleather can be coated or imprinted before being used for a wide variety of products which otherwise use traditional leather. The production process, which involves mashing, cooking and drying, is much cleaner than the traditional leather production. Using natural materials, Fruitleather is much less harmful to the environment and animals.

Fruitleather Rotterdam is now developing the material further, making it strong enough to be used to make shoes, handbags and other products.

www.fruitleather.nl

The aim is to recycle 3x more waste in 2020.

De Gezonde Stad Zero Waste Lab

Waste as a currency

The Zero Waste Lab by De Gezonde Stad is a local spot used to collect and upcycle waste. The community's rubbish is exchanged for a local currency which can be used to buy goods and services at local shops.

How?

The first Zero Waste Lab opened in Amsterdam in 2016. Local residents are supplied with a hopsack that they can use to collect a wide range of waste, including paper, plastic, textile, batteries, lamps, latex paint, vegetables and fruit and e-waste. After handing in the bag, the resident receives a coin which he or she can use to, for example, buy a cup of coffee, to get a discount on groceries, clothing or reading glasses. The waste will be reused or recycled.
The lab itself serves as a place to inform the neighborhood about the benefits that recycling waste has for the environment, the city and the person. The second lab on the Waterlooplein was opened in 2017.

Why?

Just 27% of the waste in Amsterdam is separated, unlike the rest of the country where the figure is 51%. Amsterdam's goal is to separate 65% of its household waste by 2020. The Zero Waste Lab scheme is meant to make it easier and more enjoyable for the community to separate their household waste. The organization is run by people who are distanced from the labour market. The organization trains them to be raw materials experts. The delivered waste will be upcycled and reused locally.
The rest of the rubbish is collected by Zero Waste Lab's business partner AEB, and will be recycled.

Ambition

De Gezonde Stad's ambition is to contribute to a circular economy with the Zero Waste Lab scheme and create awareness about the value of waste. The organization's goal is to put a Zero Waste Lab in every neighborhood.
The aim is to recycle 3x more waste in 2020 (compared to 2015).

Partners

The project is supported by Ymere, AEB, Gemeente Amsterdam, Cities Foundation, De Regenboog Groep, Milieuwerk and EY. De Gezonde Stad also collaborates with market vendors of the Dappermarkt and local business persons of the Dapperbuurt, the Dapperschool and the residents.

www.zerowastelab.amsterdam

This product is not only circular, but also functional.

Denimtex

Jeans on the wall

In the Netherlands alone, no fewer than 1.2 million items of clothing are tossed in the incinerator every year. Absurd, says painting company Gebroeders van der Geest. That is why it devised a resourceful application for discarded clothing: Denimtex. It literally turns jeans into wall covering.

Wall coverings

1.2 million items of clothing, that is a huge amount of materials that will eventually be irrevocably lost in waste incineration. This is how the linear economy is organized, with the possible applications of waste being numerous. In a circular economy, companies innovatively deal with waste and, strictly speaking, there is no such thing as waste. Everything is a raw material in an endless production cycle.

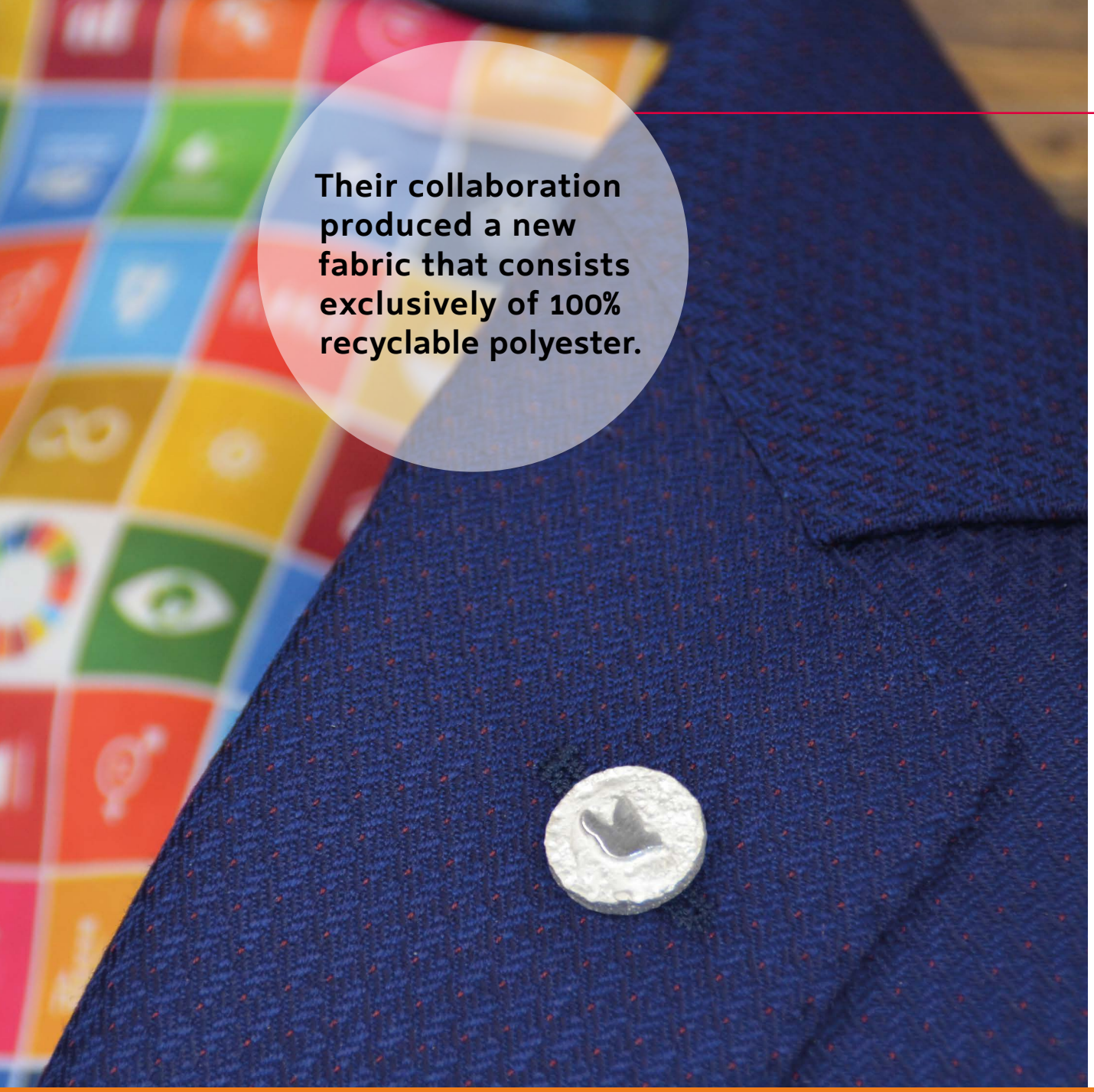
The subsidiary of Gebroeders van der Geest unravels used clothing into textile fibers, using fiber-optic machines. With a bio-based glue from flaxseed oil, Denimtex ultimately processes the fibers into a paste that can be applied to walls and ceilings. This ceiling and wall covering forms a sustainable alternative to wallpaper and paint that is both recyclable and reusable. For example, Denimtex combines materials from the biological cycle with technological raw materials to produce a product that is 100% circular.

This product is not only circular, but also functional. It is sound-absorbing, moisture-regulating and suitable for almost every surface. There is no limit to the assortment of aesthetic motifs to adorn the wall coverings of the house. With an assortment of more than two hundred articles of all kinds of different types of textile, Denimtex offers a suitable product for everyone.

Successes and ambitions

Denimtex has been able to develop a production model that is completely circular. With the wall-covering the company contributes to reducing waste, as well as to the exemption of the hardware that the industry imposes on the earth's facilities. Because all Denimtex products are recyclable and reusable, waste is not only diverted and deferred, it remains raw material in a circular business model.

www.denimtex.nl



DutchSpirit

100% recyclable workwear

Every year, the workwear industry in the Netherlands uses many millions of meters of fabric. In Europe as a whole, this amounts to between 400 and 500 million meters a year – an enormous potential for a circular solution.

Innovative solution

Workwear, for example in the health-care or cleaning sector, usually only lasts about 18 months. Recycling is not possible because the material consists of polyester and cotton, which cannot be separated.

DutchSpirit saw a challenge and teamed up with Schoeller Textiles to develop a new kind of recyclable fabric specifically for workwear.

Their collaboration produced a new fabric that consists exclusively of 100% recyclable polyester. In order to guarantee complete recycling, they formed a closed loop of collaborating European companies called Wear-2wear. The fabric is available to all suppliers and manufacturers. DutchSpirit is now able to fully dress a company's workforce, from polo shirts to overalls, from softshell vest to rainwear, and all of it 100% circular.

www.dutchspirit.com

It is the first time that calcium carbonate (lime) is used worldwide for the production of carpet tiles.

Tarkett Carpet Tiles

Walk on (residual matter from) water

Carpet manufacturer Tarkett has succeeded in developing lime-based carpet tiles: a residual product from the production of drinking water. Tarkett worked together with a Dutch group of drinking water companies for this.

Upcycling of lime from drinking water

It is the first time that calcium carbonate (lime) is used worldwide for the production of carpet tiles. Tarkett cooperates with Reststoffenunie, an association of drinking water companies, for up-cycling lime. The lime itself comes from the drinking water companies Brabant Water and WML (Water Maatschappij Limburg). When processing drinking water, a lot of calcium carbonate remains after the groundwater has been softened. Softening is a necessary step in making groundwater suitable for drinking water. Softening is also important for another circular reason: softened water prolongs the life of household appliances because it reduces calk. The remaining lime now also has a high-quality use. This lime form has now been positively defined in accordance with the Cradle-to-Cradle criteria and is now used for the production of EcoBase carpet tiles. Thanks to the processing of this lime, this product is 100% recyclable in Tarkett's own production process.

Ambitions Tarkett, Brabant Water and WML

Tarkett is committed to the development of products suitable for intake and recycling in a non-toxic closed loop, the foundation for a regenerative circular economy. The use of the lime is a next step in realizing this ambition. As the first climate-neutral drinking water company in Europe, Brabant Water's ambition fits in seamlessly with this. WML is already recycling 99% of its residues and sees its collaborations around circular innovations increase.

A local breakthrough

With the help of Sibelco, a supplier of industrial minerals, the size and distribution of the calcium carbonate particles for Tarkett has been tailored to suit. This has enabled Tarkett to organize the acquisition and processing of the lime on a local scale. This can therefore rightly be called an innovation in the value chain. In its continuous ambition, Tarkett reached an important milestone in 2017: 3,400 tons, an equivalent of 170 full truckloads, of upcycled chalk was used in Tarkett carpet tiles.

www.tarkett.nl

Black Bear

Second life for discarded tyres

Through its innovative technology, Dutch company Black Bear can recycle the main raw material from old car tyres – carbon black – and turn them into new tyres, rubber and paint products.

Globally, more than 1 billion car tyres are discarded. Most will end up in an incinerator, polluting the environment. However, the tyre’s main compound – carbon black – is of a high quality and can be recycled to produce new tyres. “The production and waste-processing of tyres are both environmentally harmful. Why not make new tyres from old ones?” says, Black Bear CEO Martijn Lopes Cardozo.

Innovative technology

Black Bear’s innovative recycling technology has two positive sides. It stops the pollution through the burning of the tyres. Additionally, it makes using crude oil in the manufacturing process obsolete.
Lopes Cardozo: “Our technology is completely new. Through comprehensive testing and constant tinkering, we have now succeeded in producing a sustainable carbon black.”

Recycling plants, globally

A Black Bear plant can process up to 1.5 million old tyres a year – this represents bigger CO_2 savings than can be absorbed by 1 million trees. The company plans to build around 800 recycle plants globally in the near future. “We are currently hard at work exporting our expertise and technological know-how. For instance, we are seeking out partners in Europe, Asia and the US to open up new plants. With 1 billion old tyres every year, over 800 plants will be able to run at a profit. Our aim is to save around 1 billion tons of CO_2 over 7 years,” according to the Black Bear CEO.

Investments

The Dutch company struck a joint venture deal with Kargro Group - which is the biggest collector of used tyres in the Benelux – called Dutch Green Carbon. Together they installed the first commercial recycle plant. The Cradle-to-Cradle certified carbon black supplied by Black Bear which is obtained from end-of-life tyres - is being used as pigment in the eco-premium products developed by AkzoNobel’s Powder Coatings business.
With this cooperation AkzoNobel not only uses carbon black, traditionally obtained from fossil fuels with a vastly lower CO_2 footprint, but also helps to solve the global tyre waste problem.

Black Bear, together with Kargro, also secured a €10 million investment by Rabobank and the Regional Energy Fund for Limburg (LEF).

www.blackbearcarbon.com

MUD Jeans

Giving jeans a third life

Dutch fashion entrepreneur Bert van Son wants to put a stop on the environmental impact of jeans manufacturing.
He introduced MUD Jeans: a sustainable way to produce jeans.

Environmental agencies have calculated that for the manufacturing of 1 pair of jeans, 8,000 liters of water will be needed. The cotton industry is responsible for a quarter of the world's pesticide usage.

Lease scheme

These numbers shocked Mr. van Son and he decided to take action with his product line of MUD Jeans. His brand of jeans uses fabrics that contain 40% recycled denim, a true innovation. However the most innovative part is its lease scheme.
By leasing out their jeans, MUD Jeans keeps its product within their product cycle. Every returned pair of jeans will be recycled into a new product and the customer will receive a new pair of jeans.

Upcycled and recycled

When turned in, the old jeans will be upcycled to 'vintage jeans'. After that product cycle, the jeans will be reused in other clothing products.

The old jeans are sent back to their factory in Italy where they are mixed with organic cotton and in the end made into new threads. Resulting in a lower demand for new cotton from the field.
Even the labels on the jeans are made from organic cotton and are printed with organic ink.

www.mudjeans.eu

Kromkommer

Combating food wastage

Too fat, too thin, too damaged, too lumpy or too crooked. About ten percent of vegetables in the Netherlands are thrown away because they do not satisfy accepted norms, even though there’s nothing wrong with the way they taste.

Beauty is skin-deep

Kromkommer (literally ‘crooked cucumber’) saves these vegetables and turns them into something new, such as soup, and sells it at some 200 sales points. Fundamental to combating this wastage, according to Kromkommer, is collaboration with other partners. To this end, the ‘Krommunity’ has come into existence, an association of parties across the whole of the food chain: from growers and restaurants to shops and, of course, the consumer.

In 2018, Kromkommer hopes to get the first unsorted Kromkommer fruit and vegetables on store shelves.

After all, at the end of the day, who’s going to notice whether the cucumber in your salad is crooked or not?

www.kromkommer.com/english

This textile is made of 100% recycled material, without the use of water or chemicals during production.

ReBlend and Ahrend

Responsible seating furniture

Every year, about the same amount of textile disappears into waste and incineration as is produced simultaneously from new materials. Why don't we take the clothing and textiles we no longer use and recycle them into raw materials to make new textiles, instead of incinerating them? With this objective, ReBlend started an initiative in 2013 in collaboration with Ahrend.

Circular in the Chain

The goal is to build bridges between textile waste, designers and textile manufacturers so that movement to a circular world is supported and accelerated. Last spring, in collaboration with leading partners from the chain, they produced a first batch of 6000 yarn.

High-quality applications

Started in 2013 as an initiative to investigate whether textile waste, which now disappears in low-value applications such as cleaning rags and filling material, can also be used for new yarns and textiles of high quality. In the Netherlands, 200 million kilos of textiles are lost every year to low-value applications. While at the same time the production of new textiles has enormous negative ecological impact. ReBlend keeps textiles in the chain and uses it as a raw material for high-quality textiles, for both fashion and interior. In August 2014, the first prototype was launched, the Ahrend 2020 office chair, upholstered with ReBlend fabric. Client reactions have been very positive; they expressed surprise that such an attractive fabric can be made from discarded material.

The textile used for this is 100% recycled material, without the use of water or chemicals during production. Meanwhile, a wall panel has also been launched, covered with ReBlend.

Lasting Impact

The underlying reason behind the first initiative and the current development is the fact that there is an extreme imbalance between the short use of textiles and the lasting impact that the materials create. ReBlend wants to develop yarns and textiles in collaboration with designers, producers and fashion labels that provide the same comfort and quality using only recycled material.

Ahrend's aim is to have as many users of this material as possible and wants to widely share this innovation.

www.ahrend.com

Construction rubble is one of the largest ecological polluters worldwide.

The Mobile Factory

Building the future with Lego

Urban development, war and natural disasters disasters cause homes to turn into mountains of rubble. The debris is seen as waste and used as a foundation for a new highways. But, it can be even more valuable. The Mobile Factory has developed a technique that ensures that construction debris can be used again for the (re) construction of houses.

From the rubble bricks are baked that have the same shape as Lego bricks, but of course a lot bigger. The mini factory in which this is done fits into two shipping containers and works according to the simple principle: ground rubble in, Lego blocks out. This has the advantage that very strong constructions can be made without cement, partly with the help of a specially written manual.

That saves time and money, essential factors for people made homeless through disaster. In addition, The Mobile Factory offers training to people in disaster areas so that the victims of a disaster can build themselves dignified, earthquake-resistant homes. Construction rubble is one of the largest ecological polluters worldwide. It is, in terms of volume, the biggest polluter in the world. It pollutes and destroys the environment and is a danger to public health for people living in a disaster polluted area. The Mobile Factory shows that this debris can be regenerated into primary building material, showing that even rubble has a place in a circular economy.

Not only the transformation of rubbel into stacking stones is circular, but also the building system itself. An obsolete structure is de-stacked, after which the stones can be used for another building.

www.themobilefactory.org

Growing in popularity Fairphone developed the first ever ethical phone in the world that is produced more fairly and with conflict free minerals in its supply chain.

Fairphone

A durable, ethical and modular mobile phone

For most people, buying a new phone every two years has become the rule rather than the exception. That has an enormous impact on both society and the environment, not least because a lot of the raw materials are mined in conflict zones.

Growing in popularity

Fairphone developed the first ever ethical phone in the world that is produced more fairly and with conflict free minerals in its supply chain. Furthermore, the device is intended to have an increased lifespan.

To this end, repairs to the smartphone are kept comparatively simple, spare parts are easy to get hold of and software is continuously updated. It has not always been easy to convince consumers to keep hold of a phone for that length of time.

With the launch of Fairphone 2 in 2015, the company made a breakthrough in design and aims for longevity. The company has already sold more than 80,000 devices across Europe.

Greenpeace recently published the Guide to Greener Electronics and put Fairphone at the top of the list of industry leaders for sustainable change.

www.fairphone.com

SEW-Eurodrive

Gearing up remanufacturing

Drive and control technology, that is industrial automation, is not the sexiest industry imaginable, but for many production companies it’s a vital one. What’s more, it’s a sector which lends itself par excellence to new opportunities, especially when it comes to sustainable materials.

Recycling metal parts

SEW-EURODRIVE is one of the major players in the development of motion control and industrial gearboxes. They produce motors and gear motors, often referred to simply as ’drives’. These drive units are extremely suitable for reconditioning, or as the company prefers to say, ’remanufacturing’.

The Dutch division has used this to develop a new approach to repair. In the event of a defect, clients can choose for remanufacturing for a fixed price. The drive is disassembled, the reusable parts and the new parts are put together and the whole is assembled as new. The drive is tested, given the same warranty as a newly engineered product, and is returned to the owner within three working days.

The company remanufactures around 2000 ’old’ drives per year. Playing its part in the circular economy.

www.sew-eurodrive.nl

“Everything that WEPA Nederland produces has had a previous life.”

WEPA

Recycling carton is second nature

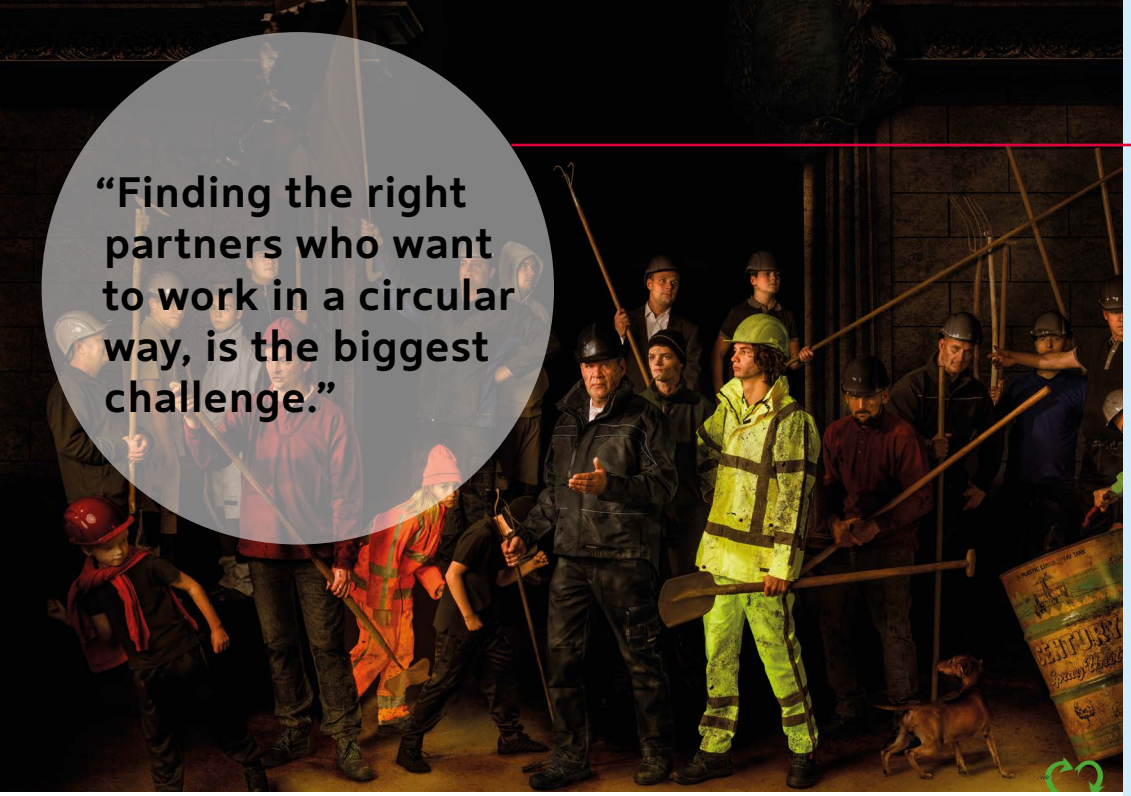
At WEPA Nederland (formerly Van Houtum), recycling has become second nature. These days, Dutch consumers can not only separate green biological waste, paper, plastic and glass, but also beverage cartons. Since January 2017, the type of carton from which beverage packaging is made is being processed in an environmentally-friendly manner by WEPA Nederland.

Everything that WEPA Nederland produces has had a previous life. Whether it was toilet paper, or a toilet roll dispenser. Their mission is to handle it in a circular way, says Managing Director Bas Gehlen. The factory began three years ago with environmentally-friendly experiments for processing used beverage cartons. In surrounding countries this was already being done, but with chemical procedures. WEPA Nederland wanted to do it differently.

15,000 tons of drink cartons

After intensive research and development, since 2016 WEPA Nederland’s used beverage carton recycling process has been up and running. The carton lands up in a huge basin with hot water, where it is washed so that high quality fibers are retracted from the packaging. After the addition of extra pulp paper, a new material is produced from which toilet paper and similar products can be made. The residual plastic is cleaned for further recycling. WEPA Nederland aims to process over 15,000 tons of used beverage cartons in 2018.

www.wepa.nl



> **“Finding the right partners who want to work in a circular way, is the biggest challenge.”**

Dutch Awearness

Circular workwear

Textile company Dutch Awearness has created the first circular textile chain with 100% recyclable fabric for workwear. Moreover, it offers circular solutions for used textiles and plastics.

Launch

Fashion designer Rien Otto worked on sustainable textile previously. Through the European Commission’s Eco-Innovation scheme, he had the opportunity to implement his idea on a large scale. This resulted in the founding of EcoProFabrics and the launch of Dutch Awearness.

Circular design

The DA Inside Workwear of Dutch Awearness focusses on circular design. The company developed their Infinity material which can be recycled 8 times in a closed loop. Additionally, the company created a track-and-trace system to map the course of the raw materials and to guarantee the origin of the materials. This system can also be applied to other types of chains. Dutch Awearness concentrates on a circular approach on all fronts, not just the production side, but also as a business model. This model incorporates the use of lease contracts on workwear.

Cliff

Clothing that is not made from Infinity material, can also be collected by the partners of Dutch Awearness. This clothing is processed into ’Cliff’, a composite of used textile and plastic. Cliff is used to make furniture, among other things, an is also 100% recyclable. The Cliff products are sold by resellers who are affiliated with Dutch Awearness.

Business chain partners

‘Finding the right partners who want to work in a circular way, is the biggest challenge’, says Rien Otto of Dutch Awearness. ‘Good communication and transparency are often at the heart of a well-functioning circular chain. We are working on work processes rather than products.

From pilot project to global collaboration

Through pilot projects, Dutch Awearness researched which types of textiles are necessary to serve the workwear market – from uniforms to protective clothing.

Dutch Awearness and its partners have now developed a full-service model: in addition to clothing, they also collect other personal protection items and plastics, so that the material can be reused in other high-quality products.

www.dutchawearness.com

Modulo Recycling Center

Circular and modular recycling center

Modulo Milieustraten develops and produces innovative, modular and circular recycling centers. Thanks to the flexible construction method, user-friendly recycling centers are built that can be adapted, removed, moved and reused over time. With maximum space utilization under the platform and minimal (capital) costs. Efficient and effective.
The future is modular, the future is circular.

Innovative, modular, circular

A modular recycling center must be adjusted every 10 years on average in connection with changes in legislation and regulations, developments and ambitions in waste separation and demographic developments. A recycling site must therefore be able to adapt to new developments. Via a flexible design it is possible to adapt the modular recycling center according to environmental demands.

With the Modulo innovative modular construction concept there is double ground use through the hollow underside of the platform. Rooms are used for the storage of waste and raw materials, sorting and processing of products and materials, repair of products for office space, recycling activities, education space, start-ups and circular initiatives. In addition to the circular flexible construction design, the construction itself is sustainable because the concrete elements are produced with secondary raw materials (eco granules) and 100% reusable.

The modular recycling center as Circular hotspot

A modular recycling center doesn’t merely collect waste, but passes it on. A recycling center is therefore much more than an environmentally friendly place to dispose of waste and raw materials. It is a conversion point. A circulation point where people recirculate materials. The new grows from the old. Due to the scarcity of raw materials, the recycling center becomes a Circular hotspot:

- **For materials to be reclaimed**
- **To strengthen local cohesion**
- **To teach new generations**
- **A business card for the municipality**

“A Circular hotspot is constantly evolving and vibrant!”. Modulo ensures that the recycling center is an “inspiration place” and “beacon” to the circular economy.

www.modulo-milieustraten.nl

The ultimate goal is to get rid of the world's plastic waste.

Skateboarding

Skateboarding on 1,000 recycled bottle caps

Ever wondered what to do with 1,000 scrapped bottle caps? How about having them transformed into a skateboard! Dutch start-up company Wasteboards came up with the world's first environmental friendly skateboard. Using a special process, the company produces unique handmade skateboards using recycled plastic bottle caps.

Collecting plastic bottle caps

The caps are collected at music festivals or, with a little help of PlasticWhale, fished out of the Amsterdam canals. Wasteboards also buys plastic bottle caps from the Royal Dutch Guide Dog Foundation (KNGF), paying KNGF double the price of what they normally would get from recycling companies. Even little kids donate their collected bottle caps to Wasteboards.

How it works

The collected bottle caps are placed on top of the melted plastic shreds in a mould. The 2 parts of the aluminium mould, weighing 35kg each, are screwed together asserting pressure to the caps and plastics. Through Wasteboards' 3 hour special baking process the shreds and the 1,000 caps melt together into 1 piece. The logos on the caps will remain visible, resulting in their unique and colourful designs. After the board is cut out of the mould and tidied up, the 'trucks' (or wheel suspensions) and wheels are added to the skateboard – in the future these parts will be made out of recycled materials too.

Mobile ovens

Apart from baking the boards in their workshop, Wasteboards also brings their mobile wasteboard bakery – transporting it in a large container – to the festival location, a world's first. Visitors can bring their own bottle caps and through the same process as in the workshop, have the skateboard baked onsite.

Skateboarding into the future

Wasteboards' mission is to help solve the world's plastic waste problem. They hope to export their idea and have their mobile wasteboard bakeries installed in countries around the world where there is a surplus of plastic waste. Initial contacts have already been established in Mumbai, Rio and Manilla.

The ultimate goal is to get rid of the world's plastic waste. As Wasteboards co-founder Jonathan Morrison says: 'We're in business to go out of business!', meaning that Wasteboards will cease to exist when it ultimately runs out of raw materials (plastic waste) and that is a good thing.

www.wasteboards.com

The Fruitmotor transforms surplus apples into high-quality ciders.

Betuwse Fruitmotor

Circular fruit cultivation

The Dutch cooperative Betuwse Fruitmotor works with every partner in the supply chain including local fruit growers and customers to create an economy without waste, by transforming surplus fruit from the Betuwe region into high-end regional products.

Local products

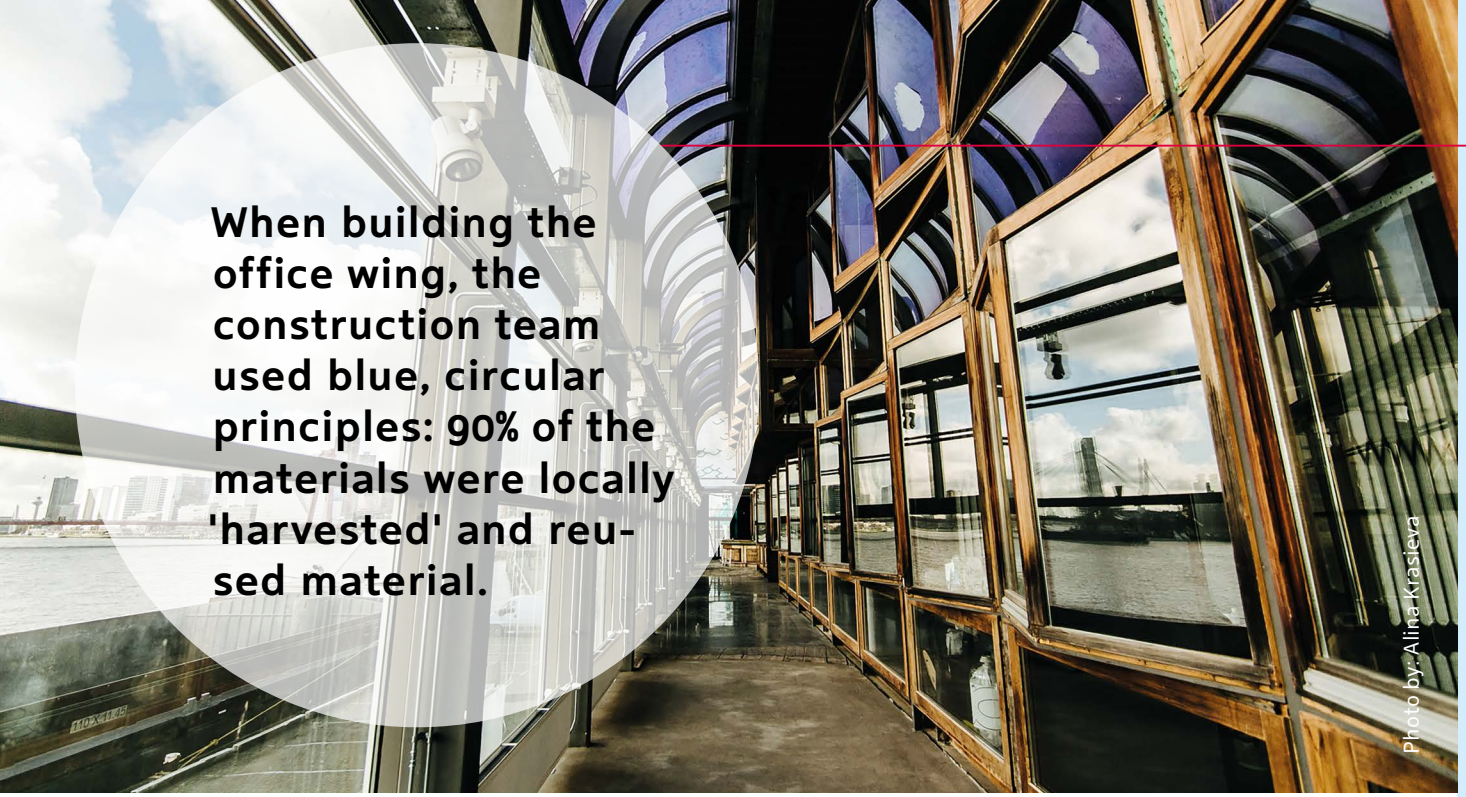
The Fruitmotor works with the traditional growers, and by adding value to their surplus fruit, the growers receive a true price which enables them to invest in sustaining their traditional orchard. It buys apples from local fruit cultivators in the Betuwse, who are also members of the cooperative. The fruits are not perfectly shaped, but still taste good. With these apples the regional wine maker produces regular apple cider and non-alcoholic sparkling apple cider. The ciders are sold in the area and beyond as a regional product called Betuwse Krenkelaar.

Improving the local biodiversity

The members will receive a fair price for their products through its cooperative scheme. The growers have committed themselves to investing the earnings in hedges and flower borders that are attractive to wild bees, thereby increasing biodiversity.

As of 2017, this scheme has resulted in the transformation of 20 tons of surplus fruits into high-end local products.

www.defruitmotor.nl



When building the office wing, the construction team used blue, circular principles: 90% of the materials were locally 'harvested' and reu-sed material.

Photo by: Alina Krasieva

BlueCity

Circular incubator

BlueCity is a breeding ground for innovative companies that link their residual flows. Here pioneers of the circular economy are gathering together, leading the way and being an example to the world. Residual flows are connected to each other and know-ledge is shared. Blue-City offers production rooms, office spaces and rooms for events.

Blue Economy

BlueCity is called BlueCity because it is largely based on the principles of the blue economy: working with what is locally available, assuming cooperation instead of competition and generating various income streams. They cross the circles of the circular economy so that networks are created that they can connect to each other. All this is done by BlueCity with the same goal: continuous innovation, creating jobs, reducing the waste mountain by seeing 'waste' as a raw material and building social cap-ital without depleting the environment.

For example, Aloha Bar-Restaurant's coffee spit forms a breeding ground for the oyster mushrooms of Rotter-Zwam. The CO2 that is released during this process is used by Spire-aux in the production of spirulina. The mycelium is used to develop pack-aging materials in the BlueCity Lab and the fungi - which of course are on the menu of Aloha. A perfect circle.

From Swimming Para-dise to the Model City

BlueCity is located in the former tropical swimming paradise Tropicana in Rotterdam. Innovative, sustainable and circular entrepreneurs are now establishing themselves between the slides and hot tubs, giving the re-maining 12,000 m_2 of new functions, meaning and value. In 2017, the office wing in the dance club was completed and the renova-tion of the old changing rooms and machine rooms was started to create ad-ditional production areas. These are expected to be delivered in 2018. When building the office wing, the construction team used blue, circular princi-ples: 90% of the materials were locally 'harvested' and reused material. This saved the construction team, consisting of Supe-ruse Studios, Coup, BIK-bouw and Theo Mostert, a total of 60 tons of CO_2 - the equivalent of driving eight times around the world. This is equivalent to what 2400 trees absorb in a year. A striking element in the former disco are the red cedar window frames. By cleverly puzzling with these frames, originating from a demolition building, they form an impressive looking façade that fits exactly. For this transfor-mation, the building was nominated for the Rotter-dam Architecture Prize 2017 and received the ARC 17 Innovation Award.

www.bluecity.nl

Bundles

Washing without waste

Dutch company Bundles introduced a pay-per-wash business model for washing machines. Households pay per laundry and receive tips and tools to lower their washing expenses and improve washing results - through a mobile app.

Sustainable machines

The start-up installs Miele washing machines at the customer's home. Miele currently manufactures sustainable washing machines and dryers. Together with the sustainable production, the company points out how easy it is to reuse the machines and the possibilities to recycle machine parts. Through its collaboration with Bundles, Miele is stimulated to design more circular (ungradable, disassembling, long lifespan, etc.), in order to reduce the costs of the wash-subscription. Bundles and Miele will ensure that the machines will get a new lease of life after their initial lifespan. However, Bundles does more than simply renting and servicing washing machines.

Product as a service

Pay-for-performance schemes stimulate the usage of raw materials and are for that reason a boost for the circular economy. Buying a product the traditional way disrupts the circular opportunities of a product. So you do not own a Bundle washing machine, but part of a wider service: cleaning your clothes in a cost effective and sustainable manner. To achieve this, Bundles has launched the Was-app which gives you tips on how to conserve energy, water and soap. Miele washing machines are connected to the internet and therefore are able to search for the most effective proportion between the washing load and amount of soap.

Bundles and Miele will ensure that the machines will get a new lease of life after their initial lifespan.

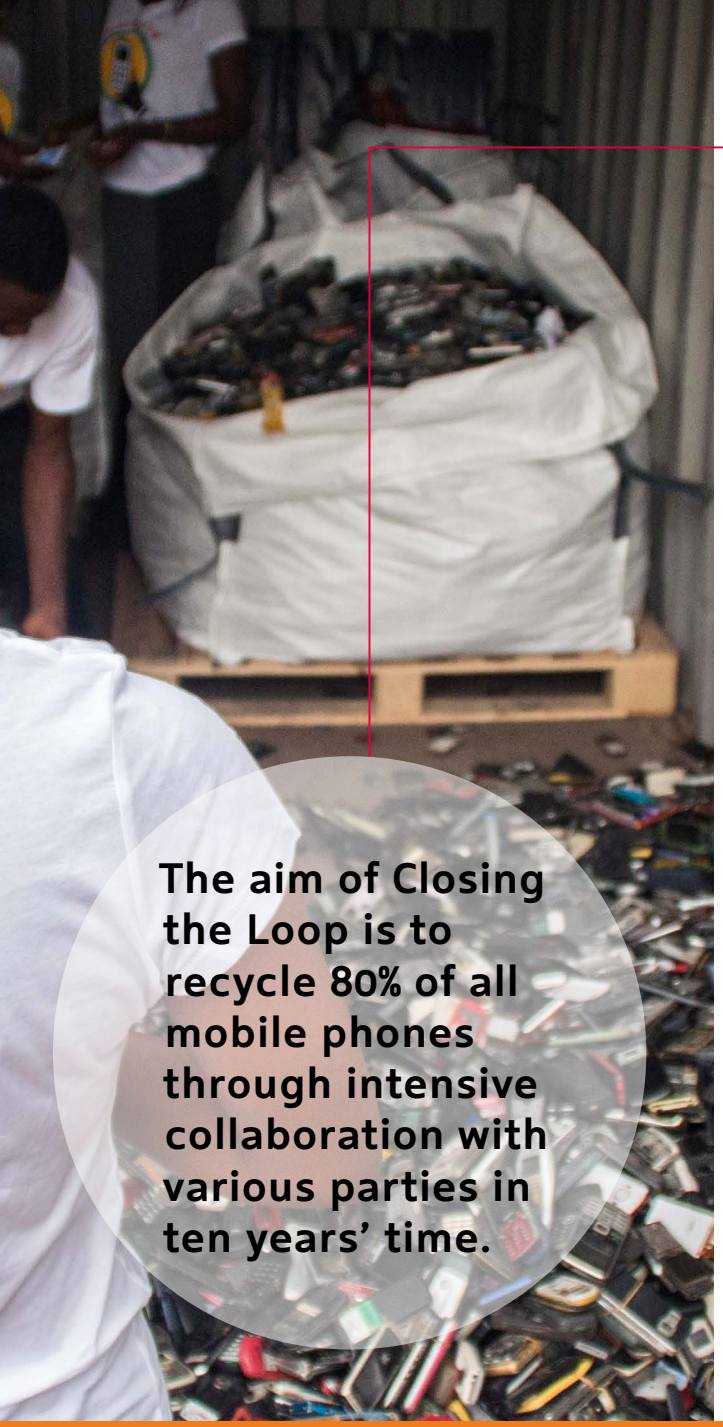
Savings that stack up

Due to the long life of the devices Bundles uses more than 2,000 disposable devices were saved togethe with more than 1,000 users. Bundles cusomters also save an average of 91 kWh of energy per year, more than 10 liters of detergent andmore than 3,000 liters of water through efficient equipment and advice. That equals 220 tons of CO_2 or a total of more than 12,000 trees that grow for one year and absorb CO_2.

Ambition

Optimizing product use by connecting the product to the web and apps is the future, according to Bundles. The software can also be linked to kitchen equipment, boilers and solar panels. Specifically products with high costs of usage and high service expenses are applicable to the upgrade market. In the end, Bundles' can relay their data back to the manufacturer, who can use it as a source to further develop their products.

www.bundles.nl



The aim of Closing the Loop is to recycle 80% of all mobile phones through intensive collaboration with various parties in ten years' time.

Closing the Loop

Understanding the mobile phone chain

Closing the Loop makes mobile phone use circular. For every step in the chain – purchase, reuse and disposal – it has developed services that make sustainable use possible.

Phone's raw material-neutral purchasing

With the 'One for One' program, Closing the Loop offers organizations the opportunity to make the use of new mobile phones circular. They compensate for raw material consumption – resulting from the purchase of a new telephone – by linking it to the collection and responsible recycling of an old telephone.

Comparable with CO_2 compensation, but then for scarce metals.

Reuse phones free of waste

The same approach is also used to give end-of-life mobile phones a circular second life. By linking each used telephone – which is sold on the second hand market – to the collection of the telephone's waste, they ensure that reuse does not lead to more e-waste in the wrong places

Recycling electronic waste

Closing the Loop buys unusable mobile phones at a fair price from the various countries and sells the waste to advanced recycling factories. The majority of the metals in the mobile phones can thus be recovered and reused: raw materials that would otherwise be lost to a large extent. In this way, the pressure on metal mining in mines is reduced. Closing the Loop has now recycled more than two million phones. The aim of Closing the Loop is to recycle 80% of all mobile phones through intensive collaboration with various parties in ten years' time. Closing the Loop has provided around 4,000 people in developing countries with extra income and has saved about 50 tons of electronic waste from ending up on the garbage dump. They have helped clients such as ING, KPMG, Schiphol and city of Amsterdam to make their telecom policy more sustainable.

Everyone benefits

Closing the Loop offers every organization that wants it an easy and effective way to make their telecom policy sustainable. This approach ensures that polluting and unhealthy jobs dealing with waste collection and separation disappear and are replaced by clean jobs. This gives a boost to local economies and entrepreneurship – Closing de Loop generates a responsible source of income for people in developing countries. Closing the Loop also sees opportunities for training the local population in the recycling of their waste.

www.closingtheloop.eu

The driving force behind this collaboration is the development of Heineken Brouwerij Zoeterwoude into a climate-neutral company.

Heineken

Creating Green Circles

Heineken Nederland is one of the pioneers of Green Circles (Groene Cirkels), a partnership to make the region a global example of green economy and sustainable area development. The driving force behind this collaboration is the development of Heineken Brouwerij Zoeterwoude into a climate-neutral company.

Nature as the starting point

A climate-neutral Heineken brewery in a climate-neutral chain, a sustainable economy and a pleasant living environment where knowledge is developed for a climate-neutral society. These are the ambitions that Green Circles are committed to. It does this by taking nature as a starting point and realizing programs on the topics of energy, water, raw materials, mobility and living environment. The Green Circles initiative was set up by multinational Heineken, province of South Holland and knowledge partner Wageningen Environmental Research (Alterra).

Regional Platform

Green Circles serves as a platform for companies, entrepreneurs and knowledge institutions in the region. The parties work together to realize their own sustainable ambitions and the common ambitions within Green Circles. By connecting the parties, the province's sustainability ambitions are accelerated and unique, world-class projects are developed.

Reuse of residual flows

Heineken Zoeterwoude has a lot of experience with reuse of its waste streams and currently recycles 97% of it with its suppliers and customers. Green Circles is researching how the residual and by-products of the brewery, such as waste stream, bostel or phosphate, can be reintroduced into the cycle. Green Circles will use this knowledge to improve the reuse of residual flows, with and for companies in the province of Zuid-Holland.

Water streams of the future

In a large local farm near the Heineken brewery, a futuristic, multi-functional water purifcation stream was created in 2015 as a pilot for Green Circles. It has proven to be an effective way to ensure good water quality, better mest and more biodiversity. Thanks to Green Circles, this process is a collaboration between the farm owner, specialists from the water trade board, biologists of Wageningen Environmental Research, the technologists of Heineken and provincial policy makers.

The partnership is a source of much knowledge, including about how to overcome the obstacles that such experiments pose in practice. It can be a best practice project for the whole province and beyond.

Green Corridor

The success of Green Circles has resulted in the signing of a letter of intent between various companies, government bodies and knowledge institutes to realise a Green Corridor, one of the first truly sustainable logistics corridors in Europe.

www.theheinekencompany.com

Every week Instock rescues around 2,500 kilos of food with their three restaurants.

Instock

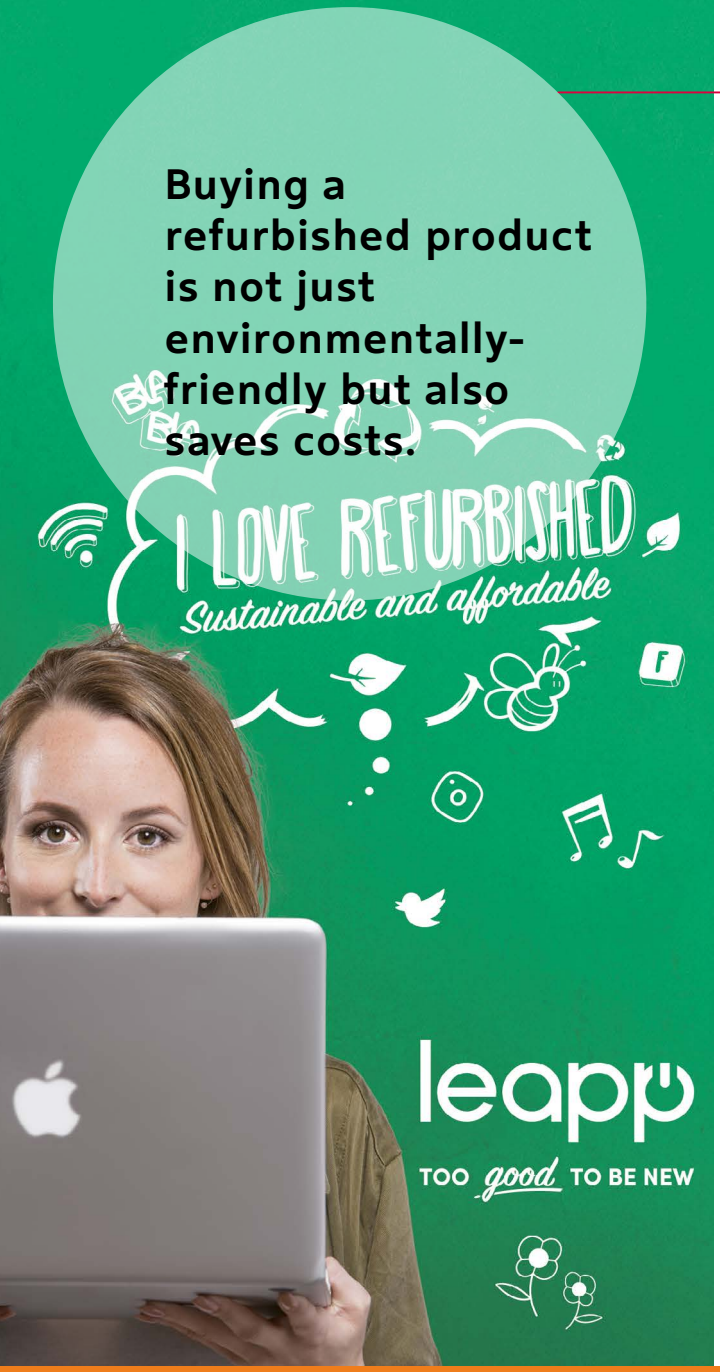
Taking a Surprising Turn on Food Waste

Every year, one third of food production is wasted. That comes down to a worldwide wastage of 1.3 billion tonnes per year. Food waste occurs in the entire food chain. The average Dutch person, for example, throws away 41 kilos of food every year!

Value in neglected food surplus

Social enterprise Instock wants to reduce food waste. They take on this challenge by using products that would otherwise remain unsold. Think for example of a ripe mango or a broccoli with a beauty flaw. Every day their chefs prepare delicious meals from the food they rescue. Instock also hopes to contribute to raising awareness about food waste with their masterclasses, their cookbook, educational projects and circular products made out of food surplus. Not only does it help combat ingrained attitudes to food waste, but it also produces some exciting cuisine.
After all, for both the chef and the consumer, what eventually lands up on the plate can be quite a surprise.

www.instock.nl



Leapp

ICT refurbishment

Every year, the Dutch throw out some 50 million tons of electronics, about 25KG per household. When founder Rogier van Camp stood in line for the new iPad 2 in New York he realized that he did not need the latest model, instead he bought an iPad 1 from the guy he was standing next to in the line. When he came back to Holland he founded leapp and began selling refurbished Apple products.

Giving Apple products a second life

Refurbished is a fancy word for used products, except that in contrary to second hand products, refurbished leapp products come with a renewed warranty, a technical check on 50 parts and a fresh installation of the software. This way leapp gives a second life to tens of thousands of Apple products every year. Not only does it contribute to an environmentally friendly society, but it also saves a lot of money.

Help saving the planet

By refurbishing Apple products leapp decreases the environmental impact of electronics. The manufacturing process of new devices releases CO_2 and creates hazardous waste. Mobile devices like the iPhone also contain rare minerals like cobalt, tin and gold. 40% of the world's excavated cobalt is used in the manufacturing of rechargeable batteries in smartphones and laptops. Giving those products a second life has a huge impact on the need for rare minerals. Besides refurbishing Apple products leapp also uses specially designed transport boxes. Instead of having a box in a box, leapp uses a design that's made out of one piece of carton and doesn't use additional plastic.

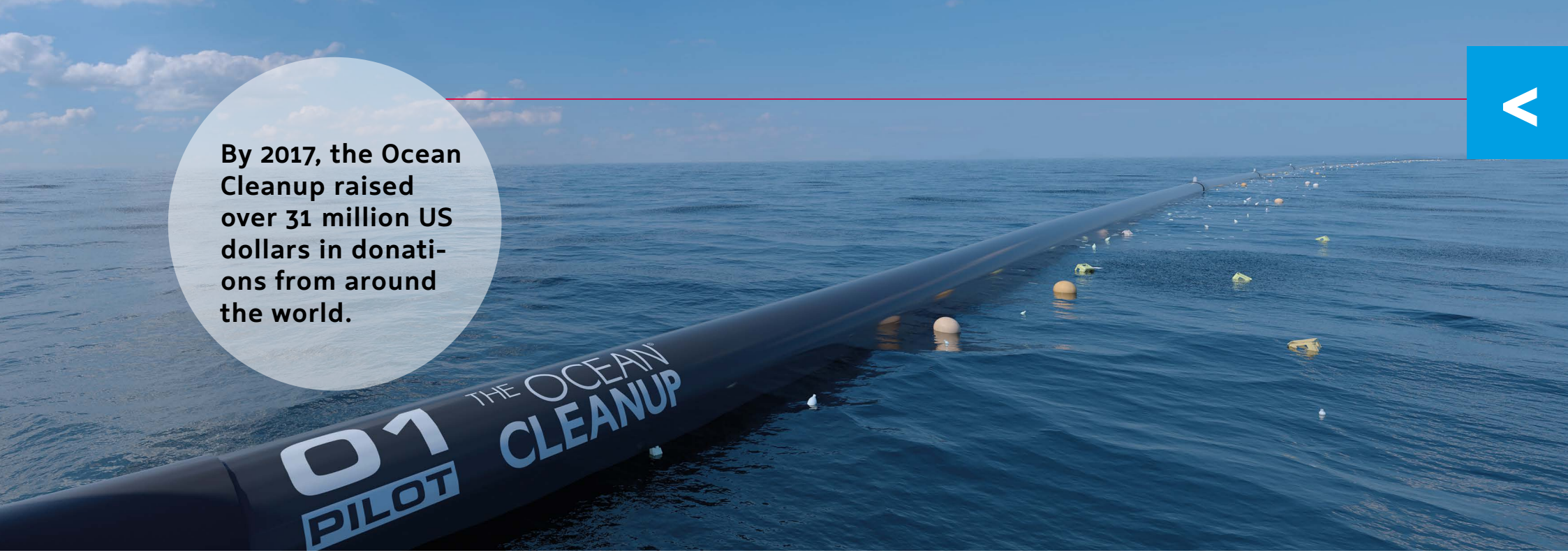
Expansion

Leapp collaborates with the larger Dutch 'Apple Premium Resellers' where customers can trade in their old Apple products. Leapp will refurbish and resell those products. Whereas their competitors choose for a web shop only approach, leapp opts for a 'click & bricks' solution. This is an area Leapp differs from its competitors.

Consumer awareness

The Leapp online store is still the backbone of their operations. It focusses on the B2C-market as well as the B2B-market. Leapp is known for excelling in service and it has been rewarded with a customer satisfaction of 8.5 out of 10 on trustpilot.

www.leapp.nl



By 2017, the Ocean Cleanup raised over 31 million US dollars in donations from around the world.

The Ocean Cleanup

Saving the sea from plastic waste

Millions of tons of plastic waste have ended up in our oceans and create a huge impact on ecology and well-being of many marine eco-systems and a considerable threat to human health.

The Ocean Cleanup

To render the impossible possible, young Dutch researcher Boyan Slat has developed an approach that promises to collect and extract plastic waste from the oceans without producing additional carbon emissions or endangering sea life. Claimed to be the largest clean-up in history, the approach uses long, floating barriers placed strategically in the ocean currents in order to corral the plastic into collection points using the power of the sea alone.

In 2014, it was confirmed that this design would indeed be capable of removing half of the Great Pacific Garbage Patch cost-effectively within 10 years.

By 2017, the Ocean Cleanup raised over 31 million US dollars in donations from around the world, including large corporations, investors and private sponsors. These funds enable Slat and his team to start ocean trials of their pilot system in the Pacific Ocean in 2018.

With their latest design improvements, the Ocean Cleanup team now estimates they will be able to remove half of the Great Pacific Garbage Patch in just five years.

www.theoceancleanup.com

Cradle-to-Cradle goes beyond material cycles: eco-friendliness is taken into account.

Park 20|20

The world's first Cradle-to-Cradle working environment

Park 20|20 in the Municipality of Haarlemmermeer, near Amsterdam, is the world's first fully operating Cradle to Cradle inspired working environment. It was developed by Delta Development Group, VolkerWessels and Reggeborgh Groep.

Park 20|20 is a business park consisting of approximately 88,000 m² of offices and approximately 3,500 m² of facilities. During development, one aspect is central: the well-being of people. This focus results in an inspiring, healthy and productive working environment. The park runs entirely on renewable energy, among others by applying hot and cold storage and photovoltaic cells. The water at the park is purified through helophyte filters.

Cradle to Cradle

Nature follows an ingenious cycle in which waste does not exist – waste is food. By taking into account the disassembly (circular design) when designing buildings, a similar approach can be applied to the working environment. So to at Park 20|20. The materials applied at the business park are biodegradable or reusable in another life as another product.

Cradle to Cradle goes beyond material cycles: eco-friendliness is taken into account. With its partners, Park 20|20 contributes to the development of new Cradle to Cradle products through an innovation platform with members such as the Arizona State University, TU Delft, Dutch Green Building Council and the Cradle to Cradle Innovation Institute.

For Park 20|20 the focus lies on the following aspects:

1. Productivity and health - Research shows that buildings at Park 20|20 increase productivity and reduce absenteeism.

2. Design for disassembly - It is important that buildings are made of re-usable materials. For example, buildings are not worthless after their life cycle, but rather a valuable asset.

3. Materials passport - A materials passport is created for each individual building, indicating what and where certain materials are applied, how much has been used and how the building can be dismantled.

4. Products as a service - Certain products are leased instead of purchased. This ensures a higher quality at lower costs for the building's owner.

www.park2020.com/en/

The Philips Performer Ultimate uses high amounts of recycled plastics.

Philips

A circular vacuum cleaner

Dutch consumer electronics company Philips has developed its first vacuum cleaner in a closed loop recycling system, the Performer Ultimate FC8955. Old Philips vacuum cleaners are collected in western Europe and recycled by its partner Coolrec. Another partner, Veolia, mixes the plastics from the recycled vacuum cleaners with other recycled plastics to create a new high quality recycled plastics grade that is used by Philips' factory in Poland to produce the new Performer Ultimate. Circular economy thinking has resulted in recycled materials becoming an integral part of Philips product design and Performer Ultimate is the first vacuum cleaner that is specifically designed for using recycled plastics. By co-creating with recyclers and suppliers of recycled materials, Philips is using its combined expertise to improve the quality of materials.

Cold challenge

Consumers often store vacuum cleaner in garages where temperatures can come close to 0 degrees Celsius. This creates an enormous challenge for Philips' suppliers as they need to create a recycled plastic that can withstand an impact test at zero degrees, which is difficult to achieve even with virgin plastics. By separately recycling Philips vacuum cleaners, the companygets access to a recycled plastic of which it is certain that it can withstand the critical impact tests at zero degrees.

Cooperation in a supply chain

Building this new supply chain in cooperation with Coolrec and Veolia required a closed cooperation between all parties that was built on mutual trust and a willingness to succeed. Besides having a great cleaning performance, the Philips Performer Ultimate uses high amounts of recycled plastics amounting to a total of 1.38 kg of recycled plastics per product. The recycled plastics are used in 5 black parts of which the upper and lower housing of the vacuum cleaner are the biggest parts. The introduction of recycled plastics in the Performer Ultimate is part of Philips' Circular Economy ambition to introduce recycled plastics in as many products as possible. The recycled plastic used is a 95% post-consumer recycled polypropylene.

www.philips.com

Philips is able to re-use up to 98% of the total weight of an MRI system for a Diamond Select Refurbished System.

Philips

Diamond Select Refurbished Systems

Philips Healthcare takes back and refurbishes medical equipment. By keeping vital parts in the chain, the health technology leader can give medical institutions access to high-quality products within the budget.

Health Technology Leader

Philips has a special offer for one of the largest medical devices in a hospital, the MRI scanner, under the name Diamond Select Advance MRI system. Philips takes back imaging systems from all over the world. Philips opened a new refurbishing factory in Best, the Netherlands in 2014. Used components are given a second life as part of the Diamond Select Advance program. The new system of the radiology clinic includes among others a fully renovated 3000 kg magnet with a warranty of at least 10 years.

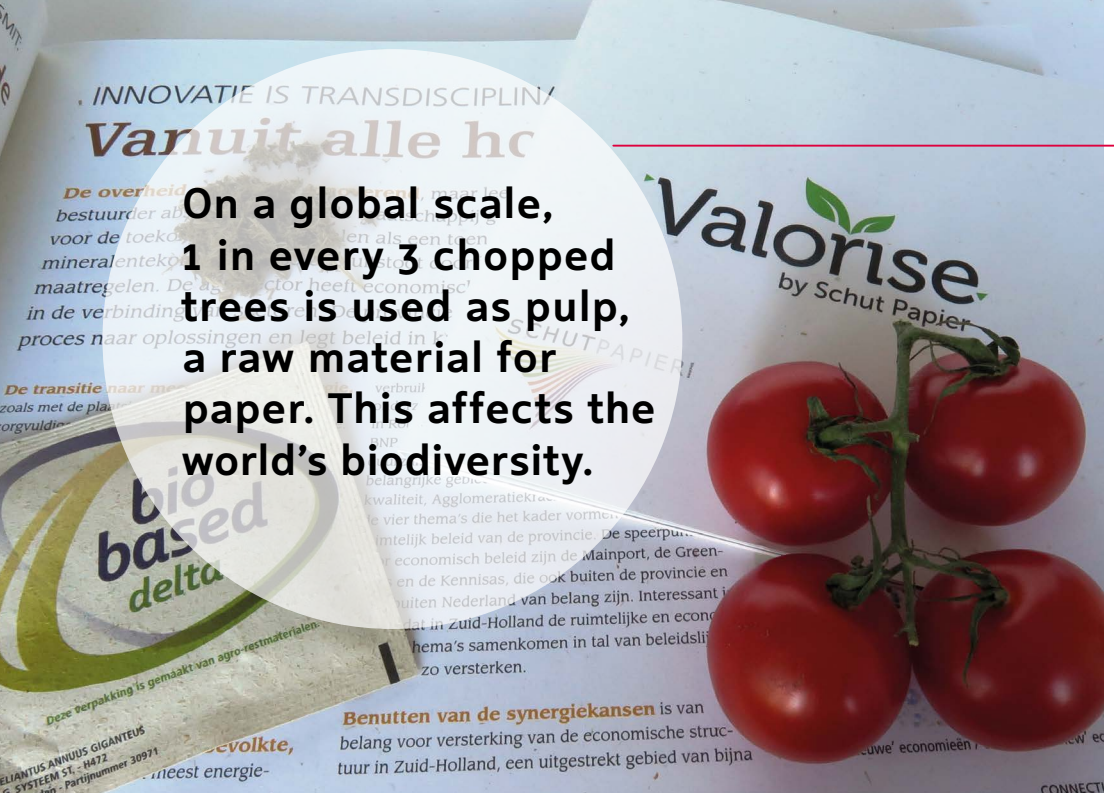
The essential steps

For the successful marketing of the refurbished equipment, Philips had to take the following steps:

- Business Models – Philips has set-up a dedicated refurbished systems business team that manages take-back and optimized re-use of components.
- Design – The smart design for reuse makes it possible to offer a high performance system at an affordable price.
- Cooperation – The Diamond Select Advance program is a direct result of close collaboration between Refurbished Systems, the service organization, the market and the end customer.
- Reverse Logistics – Reverse Logistics includes the de-installation of systems by Philips trained employees, and transport to a Refurbished Systems factory.

Philips Refurbished Systems offers not only MRI scanners but also refurbished CT scanners, interventional X-ray equipment and ultrasound equipment.

www.philips.nl/healthcare



Schut Papier

Paper made from tomato plants

Back in 2014, Dutch companySchut Papier-published the world's first book printed on paper made out of tomato plant fiber.

The company from the Netherlands officially launched their Valorise bio-paper in 2016.

Paper that can be reused 7 times over

The book's publisher asked Schut Papier if they could make paper from residue fibers from the agricultural industry. After a successful test production of 4,000kg of paper, the small company started producing paper for the book 'Connecting Industries'. Thanks to the success of the book and the interest for paper made from tomato plant fibers, the firm now produces books, boxes, menus, brochures, note pads, etc. out of bio-paper. What makes this type of paper even more special is that it can be reused seven times over.

Tomato fibers

The residue left from the horticulture sector – like tomato plant fibers cultivated in greenhouses in the Westland area – is available for free. Horticulturalists want to get rid of it, just a fraction of the material ends up as compost. By comparison, for the usual wood cellulose, paper producers pay up to €500 per ton. The paper sector has created a new supply chain which also has value to the horticulture market.

After two years of development, Schut Paper is launching Valorise by Schut Paper. This paper is the result of collaboration with growers, knowledge centres and universities for the circular value of fiber from agricultural residues such as tomato plants. The optimal scenario is that agricultural residue (e.g. tomato and paprika crops) is not composted, but that 100% is used as raw material for the paper sector and as an ingredient for other industries.

In 2015, the Confederation of European Paper Industries (CEPI) voted Schut's paper from tomato plant fiber one of the twenty most innovative products in the pulp and paper industry. The paper could be ordered in minimum volumes of 2 tons and by subscription for special production. Since the introduction of the paper, it has been successfully used for various publications and materials.

Sustainable?

The paper industry is responsible for half of the wood usage in the Netherlands.

On a global scale, 1 in every 3 chopped trees is used as pulp, a raw material for paper. This affects the world's biodiversity. Moreover, the industry uses a substantial amount of water, contributing to decreasing groundwater level and desiccation. So it goes without saying that replacing the wood pulp, albeit a small percentage, with a rarely used plant residue material will serve as an advantage to saving the environment. Schut Papier continues to explore the best ways to reuse plant fibers. Among other things, the company is working on decreasing the use of water by further recycling of the water.

www.schutpapier.nl

City Hall Venlo

Sustainable and more

The city of Venlo recently opened their new city hall. It is not just like any city hall though. This is a special building designed according to the cradle-to-cradle (C2C) principles.

Cradle-to-cradle

A structure which is built based on C2C principles, is not constructed to be demolished after a few decades. A C2C building can be seen as a raw materials bank. During the building stage, the parties involved describe what materials are used for the build. This results in a material ID, or passport for the building. Taken into account is the value of the various materials at (partial) demolishment and where to reuse the materials afterwards. This building is not only sustainable but it is literally a raw materials bank for the future.

Self sufficient

The city office generates its own energy. Through using thermal-energy-storage, solar panels, solar boilers and other energy efficient measures, the structure is energy self sufficient. Energy usage is monitored per floor and is shared through the municipality's intranet. Employees are informed about their energy usage and how they can reduce it. Moreover, rainwater is purified to reduce the consumption of clean drinking water. Furthermore, the building's green façade purifies the air outside and a greenhouse on the roof provides natural ventilation. The interior of the office has 'green' walls that regulate humidity, oxygen level and acoustics. Thanks to the large windows and solar panels, the building makes good use of the sun, an important energy source.

Social value

The Municipality of Venlo office generates social value by offering its employees a pleasant, bright and natural work environment. Just by lowering absenteeism due to illness by 1%, the municipality saves €480,000 per year – not even taking into account the increase in productivity due to the pleasant work environment.

www.stadskantoorvenlo.nl/en

It's a win-win: better crop yields and high quality drinking water.

Vitens

Water as a source of the Circular Economy

At one time, the costs of disposing residual wastestreams from the Vitens' drinking water facilities amounted to pproximately 1.8 millon euros a year. Consequently, Vitens came up with a new approach by process optimization and up-cycling to reuse these materials productively that is not only worthwhile commercially, but environmentally too.

Vitens produces 350 million m^3 drinking water annually for 5,6 million customers in the Netherlands. The production also results in 60,000 tons of byproducts, such as calcium, iron and humic acid, which are expensive to separate. In 2012, Vitens set itself the goal to ensure valuable, cost-effective and sustainable use of these residual flows.

Putting byproducts to good use

Detailed studies, in collaboration with the University of Wageningen, RoyalHaskoning DHV and others, showed that these byproducts could be used effectively in other sectors and could be sold at a profit. Vitens developed a production method whereby its humic acid could be put to use as a high-quality soil improver.

This made Vitens one of the largest humic acid producers of Europe. In addition, applications have been developed for animal nutrition. As a result, Vitens now also produces for the agriculture and animal feed sector.

Win-win scenario

As these streams contribute to sustainable agriculture, the new valorisation approach also results in cleaner groundwater. Now that Vitens can produce such natural soil improvers as humic acid and chalk pellets, it is able to cooperate productively with farmers, with whom it shares the same catchment area. It's a win-win for both: better crop yields and high quality groundwater.

www.vitens.com

Colophon

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