

June 2020



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# **Ethical** CORPORATION MAGAZINE

## **CAN THE WAR AGAINST PLASTICS SURVIVE COVID-19?**

**Hygiene  
concerns deal  
recycling  
setback**

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**PANDEMIC FORCES  
FASHION INDUSTRY TO  
TAKE STOCK**

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**AUTO SECTOR MAPS  
ROAD TO GREATER  
SUSTAINABILITY**

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**CIRCULARITY COMES  
INTO SHARP FOCUS  
FOR PHILIPS**



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## WELCOME TO THE JUNE 2020 ISSUE

**T**he sight of litter bins overflowing with plastic takeaway containers and coffee cups at the entrance to my local park is a reminder that the battle against single-use plastic, which had been making great strides since David Attenborough's Blue Planet series, has been dealt a setback by the Covid-19 pandemic.

The fate of our plastic-clogged oceans is no longer top of mind in the face of the more immediate threat of a killer disease, leading to mountains of waste from millions of discarded face masks and gloves and other personal protective equipment.

Add in plummeting oil prices, which have led to precipitous falls in the prices of virgin plastics, and the battle against single-use plastic finds itself in the teeth of a perfect storm, as Angeli Mehta

reports in the opening article of our briefing assessing the impact of Covid-19 on the circular economy this month.

However, the fact that Loop, the circular shopping platform launched last year by New Jersey recycling firm Terracycle, is going ahead with its plans to launch in the UK this year, and continuing commitment to the Ellen MacArthur Foundation's New Plastics Economy Global Commitment by its 200-plus corporate signatories, are encouraging signs.

The fashion industry is another sector to feel the brunt of Covid-19, with an inventory crisis of unsold stock adding to a litany of well-known sustainability issues, particularly in the fast-fashion end of the sector. Angeli Mehta asks whether an open letter from more than 500 figures from across the global fashion industry outlining steps to become more responsible is an early indication of a rethink of a business model predicated on unsustainably rapid growth.

From fast fashion we turn to bulky, difficult to recycle household items like mattresses and floor coverings. Oliver Balch talks to Kelly Hall >



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of DSM-Niaga, a startup venture within the Netherlands-based material science company DSM, about the challenges of reaching scale with the company's technologies to enable fully recyclable products.

Catherine Early, meanwhile, highlights areas of progress in the battle against e-waste, the world's fastest-growing waste stream. As in the fashion sector, there is hope that Covid-19 will lead consumers to reconsider how much they actually need to own, and prompt companies to investigate ways to shorten their supply chains to make them more resilient to future shocks.

Mark Hillsdon reports on how cities are at the heart of a push for more circular approaches to producing food, while Mike Scott looks at the auto sector, where technological advances like the Internet of Things, 3D printing, and the growing number of mobility-as-a-service models are leading to greater resource-efficiency in one of the most environmentally damaging industries.

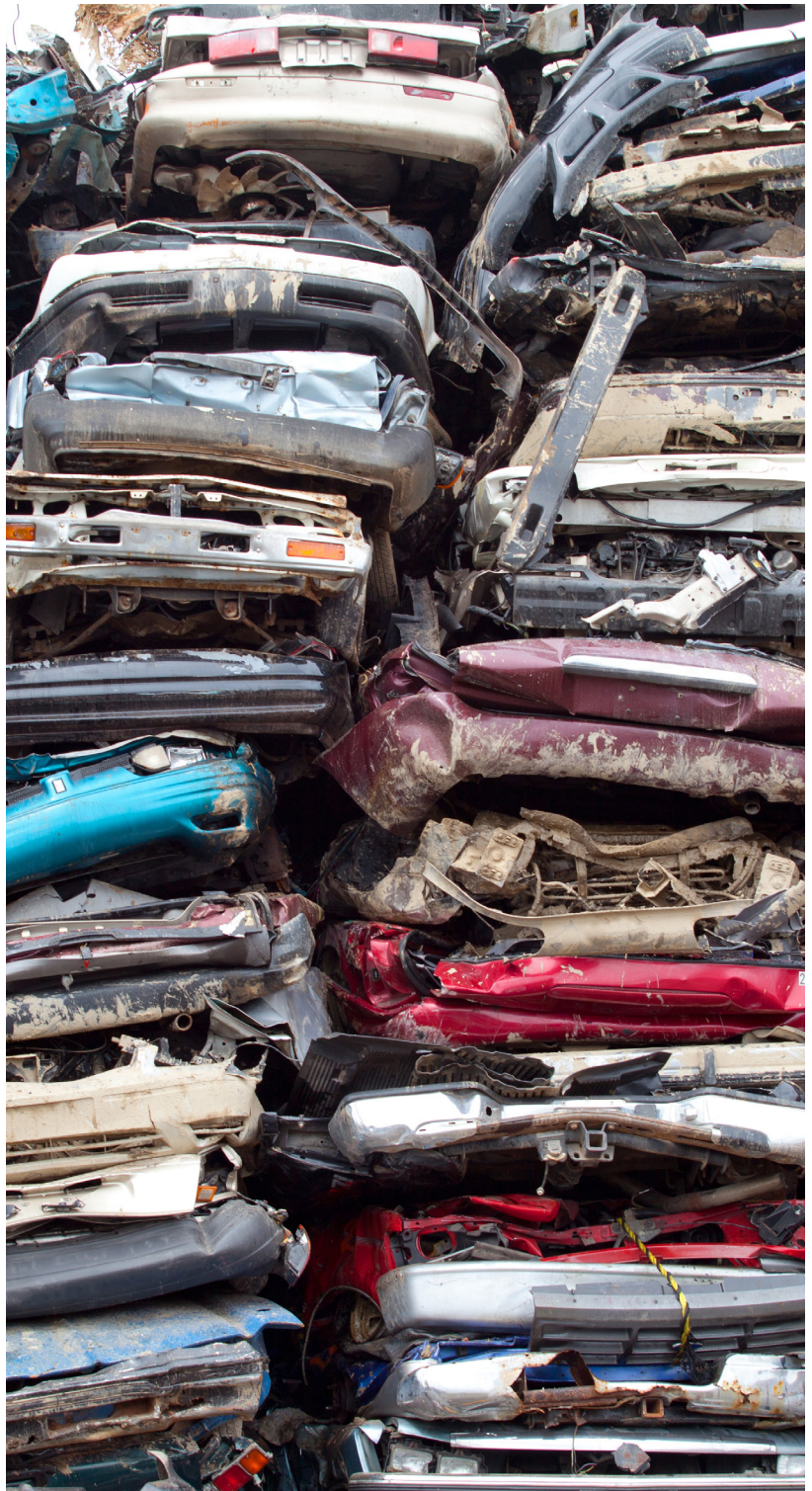
Finally, I interview Robert Metzke, sustainability chief of Dutch health technology giant Philips, about how Covid-19 has brought the confluence between climate action, healthcare and circularity into sharper focus.

Next month, we will be doing a combined July/August issue on the energy transition. Our crack team of freelance journalists will report on advances in technologies like hydrogen, geothermal, micro-hydro, vehicle-to-grid energy storage, and the electrification of air transport. And we will consider how Covid-19 will affect the delivery of ambitious corporate renewable energy commitments. ■



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# INSIGHTS AND ANALYSIS IN 2020 TO INFORM A DECADE OF ACTION

## JANUARY

### Calls to action

Thought leaders and the investment community, including John Elkington, Paul Druckman, Windy Lubber, Lise Kingo, Sally Liden and Sonya Verghese, give their marching orders for business in the coming decade of action on climate change and the SDGs

## FEBRUARY / MARCH

### Deforestation Risk

In a two-part assessment of deforestation risk in supply chains we will do deep dives into palm oil and forest and timber products in February and at soy and beef in March

## APRIL

### Smart and resilient cities and energy efficiency

How cities are adapting to climate change through the use of nature-based solutions, and cooling technologies. Our second briefing will focus on the global drive to double energy efficiency

## MAY

### How Covid-19 is reshaping sustainability

Commentary and reportage on how companies are rising to the Covid-19 challenge, and the impact of the pandemic on ESG investment, biodiversity, the energy transition and workforces

## JUNE

### How Covid-19 will affect the circular economy

Full-issue focus on how Covid-19 will affect the circular economy, looking at the impact of the pandemic on circularity in plastics, fashion, food and agriculture, e-waste and the automotive industry

## JULY / AUGUST

### Transformation of energy

For our summer issue we look at the role of investors in speeding the energy transition, new energy storage technologies, and the rise of geothermal energy.

## SEPTEMBER

### Sustainable seafood and healthy oceans

Ocean-based solutions, from offshore wind and tidal power to sustainable seafood and cleaner shipping, could provide 21% of the solutions to climate change. This briefing will explore the new front in the climate battle

## OCTOBER

### The future of work

How has Covid-19 changed working practices, including managing employee well-being, supply chains, video conferencing and business travel

## NOVEMBER

### Water risk and biodiversity

We look at growing water risk as a result of climate change. Our second briefing will be on the business-led initiatives to protect biodiversity through more sustainable land use

## DECEMBER

### Sustainable comms and marketing

How has Covid-19 changed messaging for consumers. **Plus:** Are science-based targets up to scratch, or do they need to be revised in a post-pandemic world?

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# The war on plastics hits a **PERFECT STORM**

With hygiene concerns trumping worries about leakage of plastic waste into the environment, single-use plastic is back with a vengeance.

**Angeli Mehta** assesses the damage

 **VIEW ONLINE**







KEVIN LAMARQUE/REUTERS

In this time of coronavirus, plastics are making a comeback. Concern for hygiene and plummeting oil prices have come together in a perfect storm. There's been a massive surge in production of face masks, protective suits, aprons, water bottles, visors, take-away food containers, pre-packaged produce, and home deliveries wrapped in single-use plastic bags. And for those deliveries in the UK, the 5p charge brought in to rid us of single-use bags has been waived till the autumn.

The UK government has also pushed back a ban on plastic stirrers, straws and cotton buds for six months; the Scottish government postponed its circular economy bill; and a deposit-return scheme for bottles (including plastic) is delayed until 2022.

A similar scheme in Western Australia, due to be implemented this month, is also postponed. In the midst of these delays, however, Pernod Ricard announced its intention to end single-use plastics

at point-of-sale worldwide by next year. Its CEO, Alexandre Ricard, said: "The current crisis must not be a threat but rather an opportunity" to speed up its sustainability initiatives.

In the US, the "bag the ban" campaign is aimed at stopping or overturning bans on plastic bags. Its proponents argue that reusable bags are less safe because they harbour germs, and cite a study suggesting that the virus causing Covid-19 could last as long as three days on polypropylene. Yet that same study suggested infectious virus remained for less time on paper, wood or cloth. It's not clear why consumers couldn't simply wash their reusable bags. Greenpeace US has warned of "an ecological disaster" if restaurants are encouraged to use disposables when they re-open, as has been suggested in the US and Turkey.

McKinsey notes that the hygiene advantages of plastic seem to be outweighing concerns about recyclability, or the leakage of plastic waste into the environment. Wood Mackenzie points out that changes to meat-handling and distribution measures being considered by the Chinese government could increase demand for flexible packaging. However, on the upside, in January China announced it was clamping down on

Use of disposable hygiene products has increased amid the Covid-19 outbreak.



plastics, with plastic bags to be outlawed across towns and cities in 2022.

The European Commission held firm in the face of lobbying by the plastics converters' trade body, which wanted it to delay its implementation of a single-use plastics ban by at least a year. The Commission said it was critical to press on given the pressure on waste-management systems owing to the pandemic.

### INCREASE IN URGENCY

But as more purchasing moves online, there is an increasing urgency to find solutions that enable a circular economy. Encouragingly, Loop – a circular shopping platform launched last year by New Jersey recycling firm Terracycle – now has 171 products from 26 brands on its US platform.

What a spokesman described as a “clamour to participate” means the scheme will now be rolled out across the US (except Hawaii and Alaska) this month. In Europe, the French platform, launched with Carrefour, now offers 145 products from 35 brands. A UK-wide roll-out is expected to begin in mid-July, with Tesco integrating Loop into its e-commerce platform at a later date.

Containers from brands including Unilever, Nestlé, and Proctor & Gamble are collected, cleaned and re-used. Three to four uses are required to make the system more sustainable than single-use packaging, but even including the environmental impact of delivery, there's a claimed 35% reduction in greenhouse gas emissions overall, with each additional reuse bringing further gains.

While record low oil prices make the differential between virgin and recycled plastics greater than ever, Sander Defruyt, who leads the New Plastics Economy initiative at the Ellen MacArthur



Loop, which was launched last year by Terracycle, now has 171 products on its US platform.

Foundation, suggests its impact will vary. “A long tail of very small and medium-sized companies who typically might not have a real packaging strategy, or targets ... might be more likely to stick with virgin plastics,” he suggests.

But he is encouraged that not one of the 200-plus businesses that have signed up to the foundation's New Plastics Economy Global Commitment, setting explicit recycling commitments for 2025, has asked to pull out or make changes. “On the contrary, many of these brands are reaching out to us to say we need to make sure we maintain the momentum on plastics. They very much realise that Covid-19 doesn't change anything about the fact that we have a massive plastic waste and pollution issue that still has to be solved.”

He adds that EMF is developing other pacts around the world, including in Australia and the US, and several hundred organisations have been connecting to online sessions even in the midst of the pandemic.

Similarly, signatories to the UK Plastics Pact, which have committed to making 100% of plastics packaging reusable, recyclable or compostable by 2025, have reiterated their commitments, according to waste charity WRAP. However, it acknowledges the drop in oil price is concerning.

Defruyt points to other important drivers. In the UK, a tax of £200 per tonne on packaging with less than 30% recycled content is to be introduced in 2022. Consultation on design >



**On the contrary, many of these brands are reaching out to say ‘we need to maintain the momentum on plastics’**





MAXIM SHEMETOV/REUTERS

and implementation of the measure, which will impact 20,000 producers and importers of plastics packaging, closed last month.

He says he's seen a shift in attitudes to extended producer responsibility "from being a cost industry wanted to avoid" to the realisation that it will never achieve targets unless it contributes to systems to recover materials for recycling.

A [recent report](#) by the [European Academies Science Advisory Council](#) (Easac) suggests existing voluntary and market mechanisms in Europe are not enough to tackle the plastic problem.

"We do not question the essential role and benefits of plastics in our way of life. But the warning of our report is not a dystopia of environmental activists: it's science," says Michael Norton, environment programme director at Easac.

Easac argues that in order to incentivise a rethink of product design, and properly reflect greenhouse gas emissions and pollution, extended producer responsibility schemes should stipulate fees for all packaging.

Materials that are easily recyclable would attract lower fees than materials that are difficult or impossible to recycle. It cites the example of Italy, where fees for the most readily recycled materials are €150/tonne, whilst those for unrecyclable



**The crisis has shown that we need to increase our investments because our waste-management system is broken**

materials are €546/tonne. The EU's circular economy package sets a plastics recycling target of 55% by 2030, and it wants to see 10 million tonnes of recycled plastics used in products in Europe by 2025.

#### OPTIMISING THE PLASTICS CHAIN

In April, commodity market specialists S&P Global Platts reported that in Europe, demand for recycled plastic was robust - despite the price premium over virgin plastics.

It put recycled PET clear flakes at €100 a tonne more than virgin PET.

Jacob Duer, president of the Alliance to End Plastics Waste (AEPW), says the current crisis "has shown us that we need to increase our investments; our focus on sustainability ... because our waste-management system is broken." And while there ➤





Donald Trump  
tours Shell's new  
Pennsylvania  
Petrochemicals  
Complex, which  
opened last year.

has been an increase in plastic waste, and a reduction in recycling as a result of Covid-19, “the second that the world opens up [from lockdown], I think the focus and the attention and the investments are going to be much bigger than what we have seen in the past.”

Since its launch in 2019, the AEPW’s focus has been on setting up collection and recycling infrastructure in countries where it doesn’t exist. Its 47 members have committed some \$1.5bn to prevent that leakage into rivers and oceans. AEPW also has an innovation accelerator programme, backing startups that are tackling waste management, recycling and re-engineering of plastics.

However, Rob Buurman, director of the Dutch NGO Recycling Network, says the AEPW is not focused enough on turning off the tap of single-use plastics at source. He observes that when the alliance was launched in January last year, 22 of the 28 chemical producers who signed up had invested in, or were planning to invest in, plants that could produce plastics. Among them is Shell, which opened a giant new facility south of Pittsburgh last year, with the capacity to produce more than a million tons of plastic a year.

Duer accepts the observation as valid, but adds: “For circularity to happen, we need to ensure that there is an optimisation of all points within the plastic value chain: from the front-end design ... to the collection and the recycling, and unless all

these paths are optimised, we are not going to be successful in moving into a circular economy.”

The alliance’s view is that the weakest link in that plastic value chain is waste management, and that’s where investments should now be targeted. He adds that “many companies are desperately looking for recycling materials as part of their packaging commitments”.

Defruyt of the Ellen MacArthur Foundation, however, sees the front-end design stage as critical, pointing out that packaging can only be recycled if it is designed that way.

There are some encouraging signs: Coca-Cola’s decision to change the colour of its Sprite fizzy drink bottle from green to transparent to make it easier to recycle back into bottles; and the reversal of its opposition to a deposit return scheme in the UK once it realised the mechanism was the only way to achieve targets on recycled material. However, Coca-Cola has been [heavily criticised](#) for its extensive use of plastic in its products.

Members of the AEPW are addressing other elements of the value chain. Chemicals firm Ineos is evaluating different methods of recycling polystyrene. It turns out that this polymer has the potential to be endlessly recyclable back into its monomer building blocks. Ineos also has a partnership to reuse wood pulp residue as a feedstock for PVC and polypropylene production, which would potentially slash its carbon footprint by 90%. >





HAFIZ JOHARI/SHUTTERSTOCK

**Brands decide whether they use recycled or virgin plastic; they decide if they use single-use or reusable packaging. They have the power to shift their industry**

On the other side of the Atlantic, Dow's RETAIN technology is being used to enable the recycling of multi-layer food pouches. (See [Who's bending the curve on reusing plastic](#)) Here a compatibiliser allows two types of resins that wouldn't otherwise mix evenly to be recycled together. This technology is now being used in the manufacture of pouch material for a granola pack, produced by a Kellogg's subsidiary.

And while the EMF's partners are making bigger progress on hitting recycling targets, with 60% of signatories' packaging recyclable, compared with just 3% reusable and 1% compostable, "a more fundamental shift will require more effort and more experimenting because recycling alone is not going to solve the problem," says Defruyt.

Signatories have committed to eliminate unnecessary and problematic plastic packaging by 2025, and ensure that 100% is reusable, recyclable or compostable.

Defruyt points to the global shortage of single-use personal protective equipment during Covid-19, which forced some hospitals to design methods to disinfect equipment so they could be reused. "It goes to show that the circular economy can create more resilience in supply chains."

In the long run, it's hard to say where today's crisis will leave the circular economy for plastics. But

Buurman draws a parallel with aviation. "Previously we lived in a paradigm where international flights were only going to increase; we needed to make it more sustainable, but it was growing. Now that paradigm is changing and it's possible to talk about limits."

For Defruyt, it's all down to brands and the retailers. "They decide what they use, they decide if they want to use recycled or virgin plastic; they decide if they want to use single use or reusable packaging," he says. "Essentially they have the power to shift their industry."

It remains to be seen if they will use that power. ■



**Angeli Mehta** is a former BBC current affairs producer, with a research PhD. She now writes about science, and has a particular interest in the environment and sustainability. [@AngeliMehta](#).



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NACHO DOCE/REUTERS

# Covid-19 forces fashion industry to take stock

The inventory crisis that now faces the garment trade adds to a litany of well-known sustainability issues. Some brands, like Gucci, are leading calls for a radical new approach.

Angeli Mehta reports

 [VIEW ONLINE](#)

**A**s with many other sectors of the economy, the question now being asked of the fashion industry is whether Covid-19 will provide the shock to the system so desperately needed to force a rethink of unsustainably rapid growth.

With retail shops shuttered by lockdowns, and precipitous declines even in online sales as consumer spending switched to necessities, the average market capitalisation of apparel, fashion and luxury brands dropped almost 40% in the year ➤





MOHAMMAD PONIR HOSSAIN/REUTERS

The fashion industry's complex supply chains span the globe.

to the end of March, according to [McKinsey](#), which expects “a large number” of global fashion companies to go bankrupt in the next 12 to 18 months.

The inventory crisis that now faces the industry, as it grapples with disposing of mountains of unsold stock, merely exacerbates a litany of well-known problems: long, complex supply chains that span the globe; a high carbon footprint and heavy consumption of water and chemicals; a rapid expansion in production which has led to unwanted clothing dumped in Africa, to the detriment of local production.

In 2016, [WRAP](#) estimated the fashion industry global supply chain waste was 800,000 tonnes, even before any clothing reached the consumer. In the UK alone that year 300,000 tonnes of clothing went to landfill. And as clothes buying has accelerated, our clothes are in use for less time.

Despite growing recognition in recent years of the fundamental shift that's needed, the industry as a whole has moved only slowly, with little progress on broad sustainability targets.

Then came the pandemic. As May drew to a close, Gucci – one of the industry's most influential labels – announced it was going to take a “seasonless”



**Above all we understood we went way too far. Our reckless actions have burned the house we live in**

approach to collections, one that would decrease output and increase sustainability.

“Above all we understood we went way too far. Our reckless actions have burned the house we live in,” its creative director Alessandro Michele wrote in his lockdown diary.

Gucci's parent, Kering, told Ethical Corporation that its sustainability teams were hard at work focusing on the group's 2025 sustainability targets.

Gucci's announcement followed an [open letter](#) from more than 500 figures from across the global fashion industry outlining steps to become more responsible: “We agreed that the current environment, although challenging, presents an opportunity for a fundamental and welcome >





change that will simplify our businesses, making them more environmentally and socially sustainable and ultimately align them more closely with customers' needs."

The signatories said they would work to increase sustainability throughout the supply chain and sale calendar by producing fewer unnecessary products, less waste in fabrics and inventory, and travelling less. It's a welcome commitment from an industry that accounts for 10% of global carbon emissions.

At the fast fashion end of the industry, however, there have been no visible signs of a rethink on the pile them high, sell them cheap business model. The more immediate talk is of heavy discounting to shift unsold stock, and [brands unwilling](#) to pay what they owed garment workers for goods already made but not delivered.



**At the fast-fashion end of the industry the more immediate talk is of heavy discounting to shift unsold stock**

McKinsey's survey of North American and western European sourcing executives reveals not all brands are taking steps to support their supplier base. And only 19% are providing pre-payment for orders, even though 64% of respondents said this action would have a significant impact. (See [Millions of garment workers face destitution as fashion brands cancel orders](#)) H&M was one of the first to undertake to pay its suppliers and says it will "work in collaboration to promote the establishment of sustainable systems of social protection."

### A MORE SUSTAINABLE MODEL

"When we look at the crisis, it shows the limit of the current model and how fragile global supply chains are and the lack of resilience that exists. As we look at rebuilding, there are a lot of questions for the industry – do we go back to normal, or do we explore an alternative?" asks Francois Souchet who leads the Make Fashion Circular initiative at the Ellen MacArthur Foundation.

"The climate crisis is not going away. Companies will still have to find answers to this, while creating recovery – and the circular economy offers that alternative."

A survey of sourcing executives conducted in April by McKinsey indicates they now expect [a shift](#) to a more flexible, demand-driven and sustainable model.

Moreover, it suggests the pandemic has increased consumer interest in sustainability: a survey of consumers carried out in Europe and the US in >

Gucci has announced it is going to take a 'seasonless' approach to collections to increase sustainability.



The coronavirus pandemic has highlighted the fragility of fashion supply chains.



REUTERS

March suggested 20% of them want to support local business, and in Europe 16% said they'd be buying more socially and ecologically sustainable clothing in future.

Consumers have also taken note of efforts by brands to look after their employees, contributing items like PPE, or donating to their communities. A study by the Boston Consulting Group, the Sustainable Apparel Coalition and Higg Co says more sustainable business practices will get the industry through the current crisis, and urges firms to meet supply chain obligations.

Katrin Ley, managing director of the Dutch sustainability initiative Fashion For Good, says: "Companies with a focus on innovation and sustainability are more prepared to meet the challenges ahead and will emerge from this crisis all the more strongly."

She sees the crisis as presenting "an opportunity to re-evaluate practices, better plan, streamline and coordinate our efforts to maintain the momentum we have achieved, and to ensure our efforts remain on track once we are on the other side of this."

Not surprisingly, many companies have slowed down on sustainability actions. "They've had to

Recycling associations fear unsold stock will take the place of secondhand clothing in many markets.

focus on navigating the crisis – surviving – and that probably delayed some actions. But a lot of companies we're working with will resume as soon as they can," says Souchet of Ellen MacArthur Foundation.

As an example, he points to the ongoing Jeans Redesign initiative. Last year, more than 40 companies signed up to principles on best practice across garment durability, fibre and chemical use, and recyclability. Signatories include Bestseller, C&A, GAP, Guess, H&M and Tommy Hilfiger.

The target is for jeans to be on the market before ➤

KORYENYEVA TETIANA/SHUTTERSTOCK



May next year, with some still pledging to deliver this autumn. Moreover, 17 new mills and brands, including Banana Republic and Wrangler, signed up in April, despite the disruption of Covid-19, an encouraging step in the beginnings of a more circular economy.

Over the past two years, Souchet reports a lot more appetite for the conversation, but also fear: “A lot of companies are interested ... but they really don’t know where or how to start. And if they do, they’re afraid that if they change just one product that might open them to more criticism than if they do nothing. That’s the next frontier.”

Before the pandemic, there were already innovations around made-to-order and new types of supply chains. More companies were exploring lending, resale and refurbishment. US resale platform ThredUP had expected the second-hand market would more than double by 2023 compared with 2018. It estimated the resale market was growing 21 times faster than the retail apparel market.

China’s YCloset has 15 million subscribers who pay a monthly fee and can buy an item after they’ve rented it. Last December, H&M said it would test the waters with one of its brands, and launched its first rental service for festive gowns.

“The circular economy will create different jobs: if you think about improving clothing utilisation, reselling, renting – and on top of that, the sorting, collection and end-of-use solutions. If you include that in the thinking, the circular economy could potentially benefit people in different geographies,” Souchet suggests. These could perhaps provide an alternative if the predictions of re-shoring and shortening supply chains are realised.

“

**Since the lockdown, the value of goods collected through textile banks has plummeted from £130 per tonne to just £30**



H&M launched a rental service for festive gowns last December.

So perhaps a brighter future beckons. But right now, this crisis leaves retailers and brands with huge amounts of unsold stock, with heavy discounting expected once businesses re-open. Caroline Rush, chief executive of the British Fashion Council, told [Euronews Now](#) that fashion designers should have to consider recycling this excess stock “so that the product we have is re-used, shredded, goes back into new yarns and created for the future”.

If they don’t, even more pressure will be put on the recycling end of the chain, already struggling to cope with the huge volumes of clothing consumers discard every year.

The Textile Recycling Association fears that unsold stock will take the place of secondhand clothing in many markets in eastern Europe. With Covid-19, the main markets for used clothing and textiles in Africa have closed, with Kenya – one of the biggest takers of UK textiles – banning imports until further notice.

The association anticipates an influx of second-hand clothing (cleared out by a nation under lockdown) once charity shops and recycling sites open again. Since the lockdown, the value of goods collected through textile banks has plummeted from £130/tonne in March, to an average of just £30.

With prices tumbling, and export markets closed, it fears there may be nowhere for clothes to go other than energy-from-waste incineration.

Proof, if any were needed, that the industry and its consumers really do need to change their ways. ■





Bulky household items like mattresses and carpets have been traditionally hard to recycle.

# A MISSION TO SOFTEN THE IMPACT OF SOFT GOODS ON THE PLANET

Oliver Balch talks to Kelly Hall of DSM-Niaga about the Dutch startup's approach to making household items, from mattresses to carpeting, fully recyclable



VIEW ONLINE

**T**he *Turritopsis dohrnii* is known as the immortal jellyfish because it is capable of a remarkable biological trick. When it gets old or sick or suffers a shock, this tiny tentacled sea creature is able to transform the state of its cells and revert to its nascent polyp stage, effectively beginning life again.

The magical medusa is inspiration for [DSM-Niaga](#), a startup venture within the Netherlands-based material science company [DSM](#), whose lab-coated product engineers are looking to perform a similarly regenerative feat with bulky household items such as carpets, furniture and mattresses.

Niaga is “again”, spelled backwards, so the company’s circular philosophy is in the name. It is also in its mission to design products in such a way that they can be reused ad infinitum.

“Anything can be redesigned if you have the right partners and you put the right scientists and technologists and process engineers together,” says Kelly Hall, DSM-Niaga’s energetic managing director. In post since January 2018, she describes >





**According to McKinsey, circular economy business models could be worth \$4.5tn by 2030**

her twin passions as “messy turnarounds” and “innovation programmes to drive growth”.

Six years after entering into a joint venture with Niaga’s original partners, and nearly a year on from becoming the enterprise’s sole owners, DSM’s big-ticket bet on circular manufacturing has yet to turn a profit. By Hall’s reckoning, that should change by 2023 or 2024, but she makes no bones about the challenges ahead.

Commercial glues frequently represent the sticking point (no pun intended) for the recycling of bulky items such as furniture or carpets, since most manufacturers fix different materials together so permanently that detaching them after use is nigh-on impossible.

DSM-Niaga’s patented solution is a non-toxic polyester-based adhesive that competes with conventional products on strength but just requires the application of heat or microwaves for the materials to separate with ease.

This process is only needed when the use of multiple materials is unavoidable. If a product can be made with a single material – be it wood, fabric or, as most commonly in DSM-Niaga’s case,

polyester – then the company’s credo is that it is simpler to remake like-for-like.

The startup has some impressive product examples to its name already. Like the world’s first [fully recyclable, toxic-free, premium mattress](#), which it helped produce in collaboration with Auping, a premier mattress manufacturer in the Netherlands. Or the machine-washable, fully recyclable rug made from old water bottles it created in partnership with US rug brand [Canary](#).

According to management consultancy McKinsey, circular economy business models could be worth [\\$4.5tn by 2030](#). Moreover, pro-circularity firms like DSM-Niaga have a powerful ally in the European Commission, which recently announced an [ambitious circular economy action plan](#) that should see billions of euros pumped into the sector.

Hall has no fears about being crowded out by larger players: “It is going to take lots of companies like us in order to change \$100bn of consumer goods from today’s way [of manufacturing] to the future way, so there’s plenty of room for others to be successful in this kind of innovation.” >

DSM-Niaga has partnered with Canary to create a recyclable rug made from old water bottles.





**There's a wonderful dialogue among our frontrunners that this huge mess could be an opportunity to show leadership when the lights go back on**

Kelly Hall,  
managing  
director, DSM-  
Niaga.

NIAGA

However, as DSM-Niaga's slow journey to profitability demonstrates, there are hurdles this ambitious cradle-to-cradle champion will need to overcome.

The most obvious one is gaining a foothold in the market. DSM-Niaga's strategy here rests on collaboration with small and medium-sized manufacturers in its focus categories. The model is for these established players to commercialise recyclable products created in association with DSM-Niaga and then, as consumer demand grows, for DSM-Niaga to sell back to these partners its adhesive solutions and related products from DSM's wider portfolio.

The problem is getting manufacturers to bite, admits Hall. DSM-Niaga has conducted advanced trials with 20 or so European manufacturers, which, says Hall, have evidenced "no shortage of interest" but only a handful of production contracts.

"They [manufacturers] know the future is coming and they are preparing for it but pulling the trigger, especially in uncertain economic times, ... is just a big request," she says.

After an internal shake-up last year, DSM's in-house circularity venture has emerged with a rejigged strategy. Going forward, it plans to plough its energies into just a few frontrunners that are willing to "stick their necks out and be disruptive", says Hall.

However, the timing at present is far from ideal. If manufacturers were reticent to take the

leap before the Covid-19 pandemic, then the current market turmoil will make them more cautious still. But Hall, who used to head up sales at the Fortune 500 adhesive and packaging manufacturer Avery Dennison, sees a silver lining to today's economic crisis.

"There is a wonderful dialogue happening among our frontrunners that this huge mess could be an opportunity, because, when the lights go back on, we can take advantage of being the leaders to show a better way" with products that generate less pollution, contain fewer toxins and hazardous substances, and – above all – can be reused indefinitely, Hall says.

The problem is that the titans of consumer capitalism rely on constant consumption. Even more importantly, so do the raw material suppliers that service them: ie the timber firms, the mining companies, the fabric producers, the plastic manufacturers, the chemical corporations, and so on.

It will be up to governments to level the playing field, Hall suggests, in particular to build out more comprehensive recycling infrastructure. If this were to be paid for through stricter extended producer responsibility rules, then Hall, for one, would not complain.

Some greater clarity on the term "recycling" would also be most welcome. At present, most recycling is actually downcycling, she argues. As for "re-use", most interpret the term to mean "kicking ➤





Circular Economy Action Plan “especially the intention to widen the Ecodesign Directive to focus on circularity”.

DSM-Niaga is applying circular business models. Its partnership with Auping includes a leasing option for customers. In this way, it establishes an ongoing relationship that then facilitates the product’s recovery at a later date.

Many of the products that DSM-Niaga helps bring to market also carry its tag. Some, like the Canary rug, include an explicit prompt to consumers [see image]. For the most part, however, the company’s hope is that its logo will gain recognition among mechanical recyclers, prompting them to mine the product for its raw materials rather than incinerate or dump it.

“If people see Niaga on a piece of furniture or on a mattress, we want them to know that it’s designed for reuse, and once they’re done with it to let us know because we want to get it on a fast track to another life,” says Hall.

In an ideal scenario, Hall envisions centralised collection centres run by the likes of Swedish retailer IKEA, where products of the same basic material – be it a polyester t-shirt from Gap, a polyester towel from IKEA itself or a polyester rug from DSM-Niaga – could be jointly collected and reprocessed.

It is by no means certain that a break with a “linear” mode of production and consumption will come; circularity’s success depends on startups like DSM-Niaga showing that it can work in practice.

Unfortunately, unlike the *Turritopsis dohrnii*, they will only get one shot at it. For Hall and her colleagues, it’s now or never. ■



**Oliver Balch** is an independent journalist and writer, specialising on business’s role in society. He has been a regular contributor to Ethical Corporation since 2004. He also writes for *The Guardian* among other UK and international media. Oliver recently completed a PhD at Cambridge University, focusing on corporate ethics in foreign investment.

**DSM-Niaga’s partnership with Auping includes a leasing option for customers, facilitating the product’s recovery at a later date**

the dust off” an item and re-selling it; a far cry from the full-scale cleaning, melting and working back that goes into a like-for-like product that DSM-Niaga focuses on.

“It takes time to explain what we mean by recycle and reuse,” Hall says. “We don’t want people to think that we are reusing a mattress that a kid has peed on.”

But she welcomes the focus on the design of products in the European Commission’s new



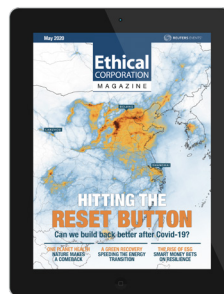
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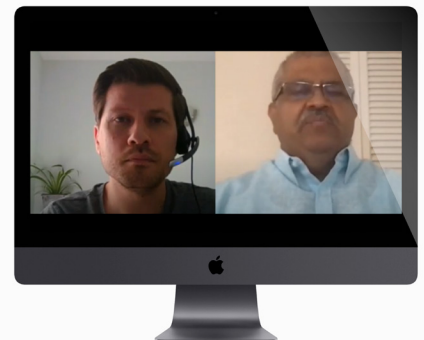
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# Why are consumers failing to plug in to the circular economy?



SHUTTERPPHOTOGRAPHY/SHUTTERSTOCK

With only a fifth of e-waste recycled globally, new business models are needed to keep products or the materials they contain in use for longer. [Catherine Early](#) reports

 [VIEW ONLINE](#)

**T**he fastest-growing waste stream in the world shows no sign of slowing down. Some 50 million tonnes of electrical and electronic waste (e-waste) is generated worldwide each year, a figure

expected to more than double by 2050 to 120m tonnes, according to a [2019 report](#) for the World Economic Forum (WEF).

Half of all e-waste is made up of personal devices, such as computers, screens, smartphones, tablets and TVs, with the remainder larger household appliances, as well as heating and cooling equipment.

Globally, around 20% of e-waste is recycled. Even in the EU, the top region for recycling, this rises to only 35%. Little data exists for what happens to the rest, and while some is inevitably stored in drawers and cupboards, or passed on to friends >



and family, much of it ends up in landfill or is incinerated. Illegal or unregulated e-waste can end up being pulled apart manually by poor workers in developing countries, who are then exposed to health problems from toxic materials.

But there is a huge opportunity to reclaim the value of precious metals present in e-waste, the WEF report states. Metals like gold, copper and nickel in products such as mobile phones, laptops and TVs are worth around \$62.5bn, three times more than the annual output of the world's silver mines. There is 100 times more gold in a tonne of mobile phones than in a tonne of gold ore, the report notes.

Finding ways to reuse materials contained in unwanted electronic products would also remove the need to extract more, cutting carbon emissions, environmental damage and human rights problems often associated with mining.

The WEF report calls for a more circular economy approach to e-waste, where products or the materials they contain are kept in use for longer. Persuading and incentivising businesses and consumers to return products to manufacturers, recycling and reuse businesses is key to achieving this.

Apple, Google, Samsung and many other brands have set ambitious targets for recycling and for the use of recycled and renewable materials.

Meanwhile, several business models have evolved to enable better collection of e-waste, including buy-back or return systems for old equipment; advanced recycling to recapture components for use in new products; and designing products that last longer and can be repaired. Selling access to a product rather than the actual product – electronics as a service – is another potential way of keeping electronics in use for longer. Lighting companies Signify and Regency sell “lighting as a service”, under which they fund and install energy-efficient lighting for businesses, which pays them back via the resulting bill savings.

Examples of such models are growing and becoming more sophisticated, says Joe Iles, circular design programme lead for the Ellen MacArthur Foundation. Giving people a good experience when buying secondhand or refurbished products is crucial to compete with buying new products, he believes.

“Getting people to buy used products has been until recently very inferior, almost like a cottage industry. But now there are many companies that are trying to recreate the delightful experience of buying new for secondhand goods,” he says.



AMIT DAVE/REUTERS

Workers in developing countries who pull e-waste apart manually can be exposed to toxic materials.

One such company is UK-based refurbished goods retailer [Backmarket](#), whose strapline is “new is old”. It provides buyers with the same types of warranties, information and confidence that they receive when buying new.

German company [Grover](#) rents electrical equipment such as TVs, phones and laptops to consumers for a monthly charge. At the end of the rental period, they can choose to continue the lease, buy the product or send it back for free.

Iles believes that Covid-19 could boost the concept of the circular economy for electrical products, as consumers reconsider what they really need to own, while companies producing or relying on electrical products investigate ways to avoid disrupted supply chains. “When you get these global shocks, it does make people question the resilience of supply chains, and makes us think about systems, which is fundamentally what the circular economy is about,” Iles says. ■



**Catherine Early** is a freelance journalist specialising in the environment and sustainability. She writes for Business Green, China Dialogue and the ENDS Report among others. She was a finalist in the Guardian's International Development Journalism competition.





# HP AND SINCTRONICS TRY TO CLOSE THE LOOP ON E-WASTE IN BRAZIL

 [VIEW ONLINE](#)

**W**inner of the Circular Innovation Award at last year's Ethical Corporation Responsible Business Awards, IT products giant HP and manufacturing firm [Sinctronics](#) have partnered on a circular economy model in Brazil since 2012. HP has significant manufacturing operations in the country, and has a target to send zero waste to landfill.

Sinctronics, a unit of global manufacturing company Flex dedicated to recycling IT equipment, built a recycling and innovation centre next to HP's manufacturing site. This enabled the two firms to share practical insights on designing products to incorporate recovered materials, with the aim of creating a closed-loop process between manufacturing and recycling end-of-use products. Its main product to result from this is the HP Ink Tank printer.

So far, the closed-loop system only covers recycled plastics. There aren't other manufacturers in Brazil that Sinctronics can work with to recycle other recovered components from e-waste, such as metals and circuit boards, but these are sent to Belgium to the refiner Umicore, which recovers precious metals from industrial waste for reuse.

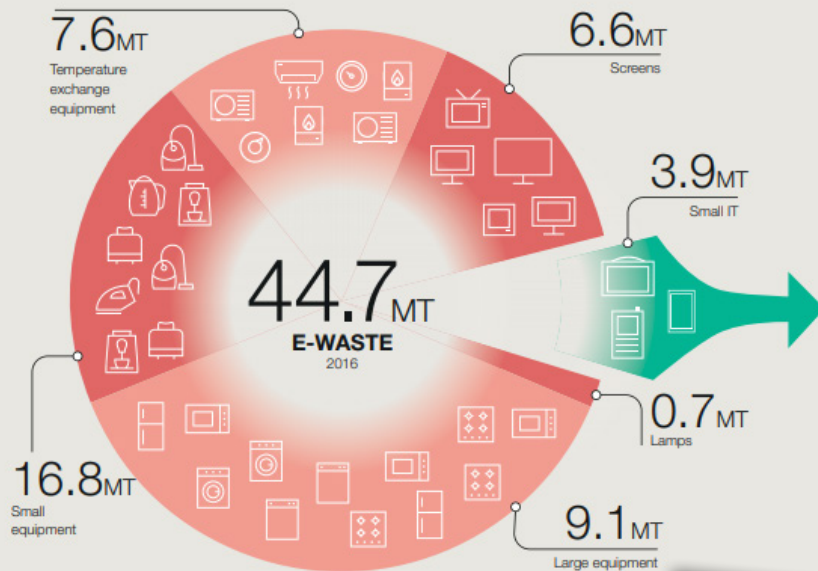
"We are extending the project to other materials, but it's still in research phase," says Paloma Cavalcanti, HP Brazil and Argentina sustainability manager.

"We have potential for a much higher recycled content in the Brazil portfolio, but to do that we need feed-stream. That's the main challenge we face today. We have all the technical solutions developed, but we need consumers to bring us back the equipment."

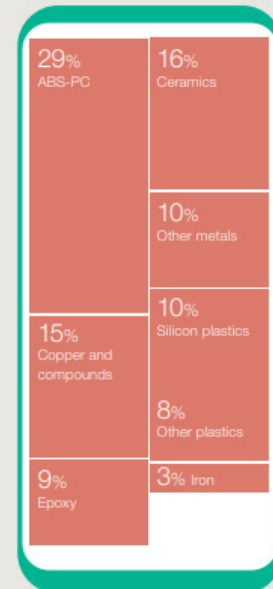
In 2018, HP and Sinctronics devised a new strategy to involve waste cooperatives working in the informal sector. "The informal sector is responsible >



## WHAT IS E-WASTE?



What's in a typical mobile phone?



SOURCE: GLOBAL E-WASTE MONITOR, 2017

for collecting 90% of recyclables in Brazil, they have a fundamental role,” Cavalcanti says.

HP needed to create a way that it could have a long-term relationship with the workers, who tended to sell to different people daily. The firm guaranteed that it would buy all the waste electrical equipment they collected – whether HP-branded or not – at a premium price, and gave them training on safety and environmental standards. It worked with Social Accountability International, a charity that audited the cooperatives and ensured that they were not using child labour, or other practices that were unacceptable for HP.

HP has worked with around 310 workers through two cooperatives in São Paulo, and hopes to work with two further cooperatives by the end of the year. It has so far collected more than 170 tonnes of e-waste through the informal sector, and has increased the percentage of recycled plastic in the printer to 25%, with a goal to hit 32% by the end of 2020.

Cavalcanti hopes that HP can also work with individual waste collectors outside the cooperatives, but meeting HP's supply chain standards could be more challenging, she explains.



Workers at the Sintronics recycling centre, which has partnered with HP since 2012.

“They have improved their conditions, management skills and revenue, and we have achieved huge savings in terms of logistics, which would be a significant cost if we collected from customers’ homes,” says Cavalcanti.

Currently, the cooperatives are not working, as Covid-19 spreads throughout Brazil. HP has launched a campaign for consumers to return unwanted electronic waste directly, and in return for each kilogramme it receives, HP sends one kilogramme of food to the cooperatives. ■

Catherine Early



# UK IN PUSH TO PERSUADE CONSUMERS TO SURRENDER USED DEVICES

**S**ixty-seven countries have enacted legislation to encourage recovery and recycling of the e-waste they generate, including in Europe, where WEEE legislation puts responsibility on the companies that produce electronic equipment. But such schemes fall at the first hurdle if consumers hang on to used devices.

In the UK, producers of electrical appliances are required to recycle 65% of the average weight of e-waste placed on the market in the three preceding years. This target was raised in 2019 from 45%, in line with an update to the EU regulation. But the sector has failed to meet these targets for the past three years, due in part to a lack of products being placed into the waste system by consumers.

Manufacturers who do not meet the targets must pay into a fund, run on behalf of the government by Material Change, an organisation comprising nine trades associations from different parts of the electronics sector. In 2017 and 2018, £10.6m was paid into the fund. Material Change decided to use the money to fund a campaign to significantly boost the amount of small electricals collected for recycling.

The first phase involved extensive consumer research, which revealed that almost half (48%) of respondents were unaware that electrical equipment could be recycled, 45% did not know how to recycle

electricals, and 43% put such items in their non-recyclable waste bag.

The survey also identified a tendency to hold on to higher-value products such as laptops and cameras in case they were useful in the future. Concerns over data were a key barrier to recycling items such as laptops and cameras for 25% of respondents.

“Two types of undesired consumer behaviour need to be tackled – binning and hoarding,” said Scott Butler, executive director of Material Change.

A three-year campaign that aims to make recycling e-waste easier is now live and will be rolled out through social media, outdoor posters and adverts on public transport

A website has been launched as a “one-stop shop” for information on recycling, repairing and reusing old electricals. People can find nearby collection points by inputting their postcode. Future phases of the campaign will fund new collection points around the country and work with schools.

The campaign is aiming to tap into people’s desire for hope, Butler says. “We’re not looking at a massively sophisticated change of behaviour, it’s very simple – stop losing the value, and start doing the right thing.” ■

**Catherine Early**

In the UK, recycling of personal electronics is low due in part to concerns over data.







# Cities at heart of revolution in how we produce food

With the 20km of land that surrounds urban areas home to 40% of all global croplands, the Ellen MacArthur Foundation believes the road to a more circular food system starts at city hall. **Mark Hillsdon** reports

 **VIEW ONLINE**







FOTOKOSTIC/SHUTTERSTOCK

**T**he way in which food is produced is under ever-increasing scrutiny, from the failings of factory farming to the health dangers of over-processed foods and the growing damage that agriculture is doing to the soil in which we expect crops to grow.

Add in growing levels of food waste, water pollution caused by fertiliser run-off, and the fact that the agri-food industry accounts for nearly 25% of all greenhouse gas emissions, and the time seems ripe to shift our traditional linear food system to a new circular economy for food.

These were some of the key thoughts in last year's [Cities and Circular Economy for Food report](#) from the Ellen MacArthur Foundation (EMF), which have since formed the basis for the organisation's Food Initiative.

The EMF report predicts that by 2050, 80% of all food will be consumed in cities. While urban areas currently produce little more than a third of the food they need, the 20km of land that surround cities are home to 40% of all the global croplands. Reconnect with these farms, the foundation reasons, and cities could be at the centre of a food revolution.

"It's about bringing the production closer to consumption and re-writing the logic of supply chains," explains Emma Chow, food initiative lead at EMF, who points out that much of the food grown in these peri-urban areas ends up being exported, with similar produce then imported back into the cities from further away. "It makes no sense," she says.

This reconnection between cities and the farms on their doorsteps can also help to change farming practices, says Chow. Cities have huge demand power: they can dictate what is grown, and by connecting with regional farmers they can start to build direct relationships and become active catalysts of change, rather than passive consumers, says Chow. >

Damage to soil, fertiliser run-off and high emissions are putting modern agriculture under increasing scrutiny.





## Vacant urban land has been turned over to growing food in community gardens in São Paulo in Brazil



CIDADES SEM FOME

“That’s what enables a shift towards better practices, and a shift towards more diverse food crops,” she says.

Bringing circulatory principles to the food economy is a more complex proposition to closing the loop around a manufacturing process, where there are clear lines for recycling and reusing.

The circular economy for food revolves around three principles: designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.

One of EMF’s partner in its food initiative is Brazil’s largest city, São Paulo. The city estimates that its total demand for fruit, vegetables and leafy greens could be fulfilled by using 54% of the existing peri-urban cropland. Projects involve turning 25% of municipal organic food waste into fertiliser for local farmers to support regenerative farming, and promoting soil health and a greater diversity of local crops for the city’s thriving restaurants, yielding savings worth an estimated \$140m in areas such as landfill and health costs, as well as job-creation.

Unfortunately, São Paulo, along with two other major partners, New York City and London, happen to be among the hardest hit by the Covid-19 pandemic, forcing postponement of some of the planned announcements.

But there are other cities where ambitious circular

food economy initiatives are going ahead. The Canadian city of Guelph, which was featured in the EMF report, has set out to build Canada’s first tech-enabled circular food economy through its [Our Future Food](#) project, which is increasing access to affordable food, creating 50 new circular economy businesses and supporting a 50% growth in revenue generated from eliminating food waste.

The city’s 10-point Covid-19 recovery plan, which was launched in May, included several food projects, including its innovative Circular Food Economy iHub, which harnesses data and technology to enhance food security and support a more sustainable food economy.

### REGENERATIVE FARMING

Companies are also participating in the push to more circular food systems.

The UK food retailer Waitrose is working with the EMF around regenerative farming as one way in which it can bring greater sustainability to its operations, explains the company’s environment manager Benjamin Thomas.

But the issue is vast, he says: “The problem with the agriculture industry is it’s such a global industry that when we talk about regenerative farming systems, it’s not just [about] converting what we’ve got; it’s completely changing the way we farm.”

Regenerative farming is based on ideas such as ➤





Cities produce  
650m tonnes of  
organic waste  
each year.

BEN NELMS/REUTERS

switching from synthetic to organic fertilisers, more crop rotation and greater crop variation, which can help to promote biodiversity. Practices like this promote healthy soils, produce better tasting, more nutritious food, and also turn fields into carbon sinks, casting them as solution to climate change rather than a cause.

Other EMF partners are finding new uses, and a new value, for food by-products such as peelings, husks, stems and stalks, as they're turned into products such as compost, bio-fertiliser and animal feed, and diverted from landfill or the incinerator.

Japan's Mizkan Holdings, whose products include Sarson's vinegar, first produced vinegar using left-overs from sake production more than 200 years ago. "This mentality of using natural by-products to create something of higher value and contribute to new food culture is something that has continued at our company," explains head of sustainability, Nahoko Aritomi.

The company has recently launched a new range of plant-based products based on the principles of the circular economy. By using the entire vegetable, such as the stem and seeds from bell peppers, cobs from corn, and the seeds and skins of pumpkins, all waste is avoided, says Aritomi.

Potatoes are handed out in Washington that would otherwise be wasted due to coronavirus-related supply chain blockages.



DAVID RYDER/REUTERS

"This allows consumers to enjoy the nutrition from more parts of the vegetable, including those often overlooked, whilst it's also helping raise awareness of issues around food waste," Aritomi says.

Advance London, which is run by the London Waste and Recycling Board, is supporting SMEs that are helping to further the capital's circularity. These include brewers Toast, who have replaced barley in >





TOAST

the brewing process with surplus bread, and Chip[s] Board, which is using potato waste to develop bioplastics for products such as frames for glasses.

In March, Feitosa Foodtech, a startup from the Brazilian city of Porto Alegre, became the first winner of the Circular Economy of Food Prize. Run by Thought For Food (TFF) and Google's Food Lab Accelerator at Google, the company uses surplus bananas and their skins to produce a range of products such as ketchups and jams.

UK-based Rubies in the Rubble, meanwhile, uses surplus food that would otherwise be labelled as waste to supply a range of condiments to supermarkets and restaurants.

The company works with large-scale farmers, buying up so-called "wonky veg", produce with a limited shelf life and excess edible food which, says company founder Jenny Costa, has often been produced because of the failure of the system to match supply and demand.

"It's crazy that we have this attitude towards food and we can be wasteful with it," she says.

But it's a problem that has been emphasised by the current Covid crisis, she continues. "Whilst farmers are chucking away huge volumes that they were supplying to restaurants, we can't pivot quick enough to then stock the empty shelves in supermarkets. It just highlights the complexity of the food supply chain."

**UK-based Toast has replaced barley in the brewing process with surplus bread.**

But it's not just business that has a role to play, she says, consumers need to change too, eating more seasonally and embracing gluts of produce, cooking with them rather than ingredients which are in more limited supply.

"The current Covid-19 crisis clearly demonstrates that our food system needs to be more resilient to shocks," says Rob Cameron, Nestlé's global head of public affairs.

"We need more diverse ecosystems, less specialisation, and a circular food economy that is truly regenerative to help address the challenges of a growing population. The prevailing linear system is impossible to sustain within our planet's resources." ■



**Mark Hillsdon** is a Manchester-based freelance writer who writes on business and sustainability for Ethical Corporation, The Guardian, and a range of nature-based titles including CountryFile and BBC Wildlife.



Land Rover's REALITY programme in the UK makes use of recycled aluminium.

LAND ROVER



# Auto sector begins to map more circular road forward

Renault and Land Rover are among those adopting more resource-efficient manufacturing processes in an industry under pressure to cut its environmental footprint. **Mike Scott** reports





SANTIPHOTOSS/SHUTTERSTOCK

**T**he automotive sector is responsible for around a fifth of all CO<sub>2</sub> emissions globally. At current rates of growth, it is on track to being solely responsible for more than 0.8C of global warming by the end of the century. Cars are also responsible for 90% of air pollution in cities and contain an average of 1.4 tonnes of material, according to EIT Climate-KIC.

At the same time, the sector is a heavy consumer of other natural resources, using 80% of all the world's rubber, a quarter of all aluminium produced and about 15% of the global steel market.

It is a heavy environmental toll for an item that, on average, sits idle for 96% of the time, points out Andy Hibbert, CEO of Karshare, a company that helps people to rent out their cars when they are not using them.

One response to the need to decarbonise road transport has been to focus on accelerating the rollout of electric and hydrogen-powered vehicles. But building more cars will also significantly

increase the emissions from manufacture, and it doesn't solve problems such as resource-depletion.

The need for alternative solutions led to the launch of the [Circular Cars Initiative](#) at the World Economic Forum (WEF) in Davos this year. Backed by EIT Climate-KIC, WEF, SystemIQ and the World Business Council for Sustainable Development (WBCSD), the initiative includes material suppliers, fleet operators, re-manufacturers, recyclers, data platforms and regulators, and will create a roadmap for a more circular car industry this year.

Joss Bleriot, institutions, cities and governments lead at the Ellen MacArthur Foundation, said a circular scenario for passenger cars could reduce global CO<sub>2</sub> emissions by 70%, or 0.4 billion tonnes CO<sub>2</sub> in 2050. He envisages a shared multi-modal mobility system in which different modes of transport are on offer that can be shared, electrified, autonomous and interconnected. "In such a scenario, passenger cars would increasingly be shared as a service, and designed for durability and reuse," he says.

These changes would mean there would be fewer cars on the road, but each car would be in use for much greater periods of the day, with benefits including less congestion, lower maintenance costs, less land and investment committed to parking >

The automotive industry is heavy on natural resources, using up 80% of the world's rubber.



Over a third of the mass of a newly produced Renault vehicle is made from recycled materials.



RENAULT

and roads, and less air pollution. “In this system, cost per average passenger kilometre could drop by as much as 77% in 2050,” he says.

Mobility-as-a-service models are already affecting the traditional car industry, with the rise of Uber and Lyft and schemes such as Karshare’s and Renault Mobility in France, which allows drivers to hire cars by the hour or by the day through a self-service phone app.

Another example is Wagonex’s pioneering “just in time” approach to car accessibility, which uses a monthly subscription model rather than traditional outright car ownership.

On the production side, remanufacturing and closed-loop recycling are key areas to consider when it comes to promoting a circular economy, says Will Craig, managing director of car-leasing comparison website LeaseFetcher. He points out that manufacturers could also introduce discount schemes, as they have in the past, to reduce the number of old diesel vehicles on the road.

Remanufacturing is nothing new, says Thomas Deloison, director of mobility at the WBCSD. “In the early days, repairing a car for as long as possible was standard practice, and it’s only in western

The rise of Uber, Lyft and car-share schemes is disrupting the traditional automotive industry model.



MIKE BLAKE/REUTERS

countries that there is a view that a car goes to the junk yard and that is it.

“Even today, there is a constant flow of vehicles from developed countries to low- and middle-income countries, where they find a new life.”

In Europe, Renault is the modern-day king of remanufacturing. Its Choisy-le-Roi plant has been remanufacturing engines and other parts since 1949. More than a third of a newly produced Renault vehicle by mass is made from recycled materials, including copper, steel, textiles and plastics. >



The results are startling from an environmental perspective: the French carmaker says that one remanufactured part uses 80% less energy, 92% fewer chemicals and 88% less water, as well as generating 70% less waste in the production process than a new component. But the benefits aren't just environmental: each part is 30-50% cheaper as well. In addition, the factory doesn't send any waste to landfill; everything is either reused, recycled or in some way recovered at treatment centres.

Renault is also a member of France's Roadmap for the Circular Economy, which aims for all of the country's plastic to be recycled by 2025, to cut natural resource use by 30% by 2030 and to create 300,000 new jobs, including in completely new fields.

Other manufacturers have also adopted circular practices. In the US, Ford is using coffee bean waste from McDonald's to make car parts, Caterpillar has been remanufacturing its pistons and cylinders for many years, and Land Rover has introduced an aluminium recycling programme in the UK.

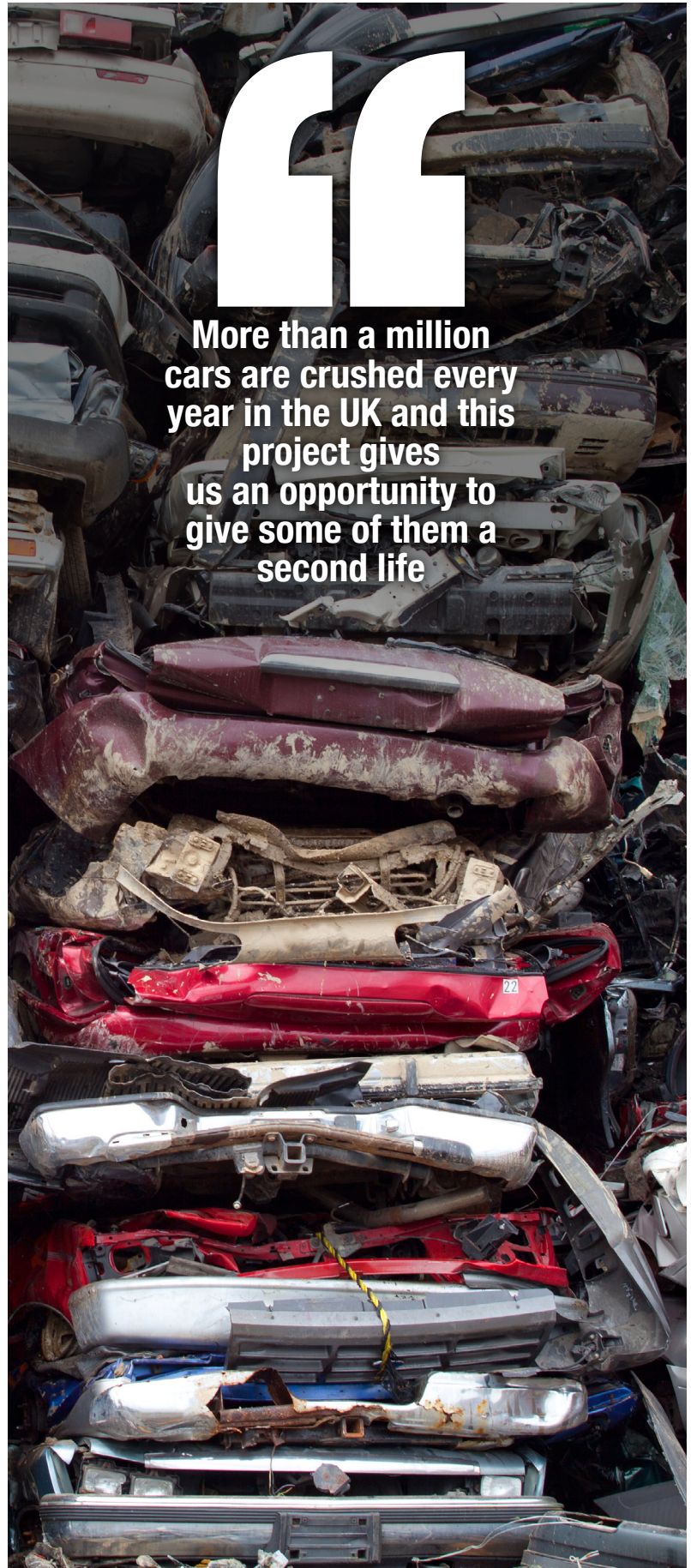
"More than a million cars are crushed every year in the UK and this pioneering project affords us a real opportunity to give some of them a second life," says Gaëlle Guillaume, lead project manager for the REALITY programme at Jaguar Land Rover. "Aluminium is a valuable material and a key component in our manufacturing process, and as such we're committed to ensuring our use of it is as responsibly as possible."

## THE ROLE OF TECH IN CIRCULARITY

All of these different aspects of the circular economy are being facilitated by a number of emerging technology trends. The Internet of Things (IoT) enables automotive materials and components to be better-tracked across their lifecycle so that they can be more easily recovered and recycled or remanufactured.

New technologies like 3D printing promise reductions in the amount of materials used, as well as the remote printing of spare parts that need replacing. And the emergence of mobility-as-a-service (MaaS) companies has created the potential for full lifecycle ownership of automobiles by manufacturers or lease companies. This gives those companies a greater interest in maintaining the value of their materials when disposing of vehicles.

The shift to electrification facilitates these developments because electric cars are much simpler than their internal combustion predecessors. "Electrification brings a simplification of design, >



More than a million cars are crushed every year in the UK and this project gives us an opportunity to give some of them a second life





## While Europe leads the way, there is a global conversation about this now, not just a European conversation

creating an opportunity to insert circular principles into the manufacturing process,” says Brendan Edgerton, director for circular economy at the WBCSD.

But changes like this will not happen without government action, not least because MaaS business models have yet to show they can make a profit. While Europe is leading the way in this area, thanks to the European Union’s Circular Economy Action Plan and a review of its End of Life Vehicle Directive, “there is a global conversation about this now, whereas five years ago, it was primarily a European discussion,” Edgerton adds.

China, Japan and South Korea also have national circular economy strategies, while some US states and companies have set up networks for sharing and recycling resources, and India and Brazil use informal recycling systems. However, according to environmental consultancy Acima, “the sum of all these efforts remains paltry. Projects operate in isolation and have not shifted the behemoths of global industry.”

Each country has to work out how they can capture the most benefit from the circular economy and mitigate their risks, so in Japan the focus is on electronics and plastic waste, while in South America there is more emphasis on building a circular bioeconomy, Edgerton says.

Collaboration is key, not just in setting standards, but also right along the value chain, from design to disposal. “The automotive industry is exceptionally complex in comparison to other industries, due to the number of parties involved within all stages of the product delivery process,” says Craig of LeaseFetcher. “Individual companies can certainly step up and do their part to become more environmentally and socially responsible. However,

New technologies such as 3D printing will help reduce the amount of materials used in the auto sector.

the impact of these steps will always be limited if a collaborative approach is not undertaken by all parties involved.”

Edgerton agrees. “We need to understand what can be done with materials. Companies need to embrace their tier one and two suppliers to design more recyclable parts. It’s a complete change in system and it needs to be done collaboratively.”

At the same time, most of the cars currently being manufactured will be share-enabled, Karshare’s Hibbert points out, adding that in the UK, some 36 million cars spend most of their time parked up and not being used. “We don’t need to wallpaper the planet with cars, we just need to use the ones we have more effectively.”

The automotive sector is highly developed and one of the most innovative industries in the global economy, but it is reaching its limits as a system, Deloison adds. “Tailpipe emissions and manufacturers’ emissions are coming under more and more scrutiny. The industry has reached the limits of the current model and it is ripe for change.” ■

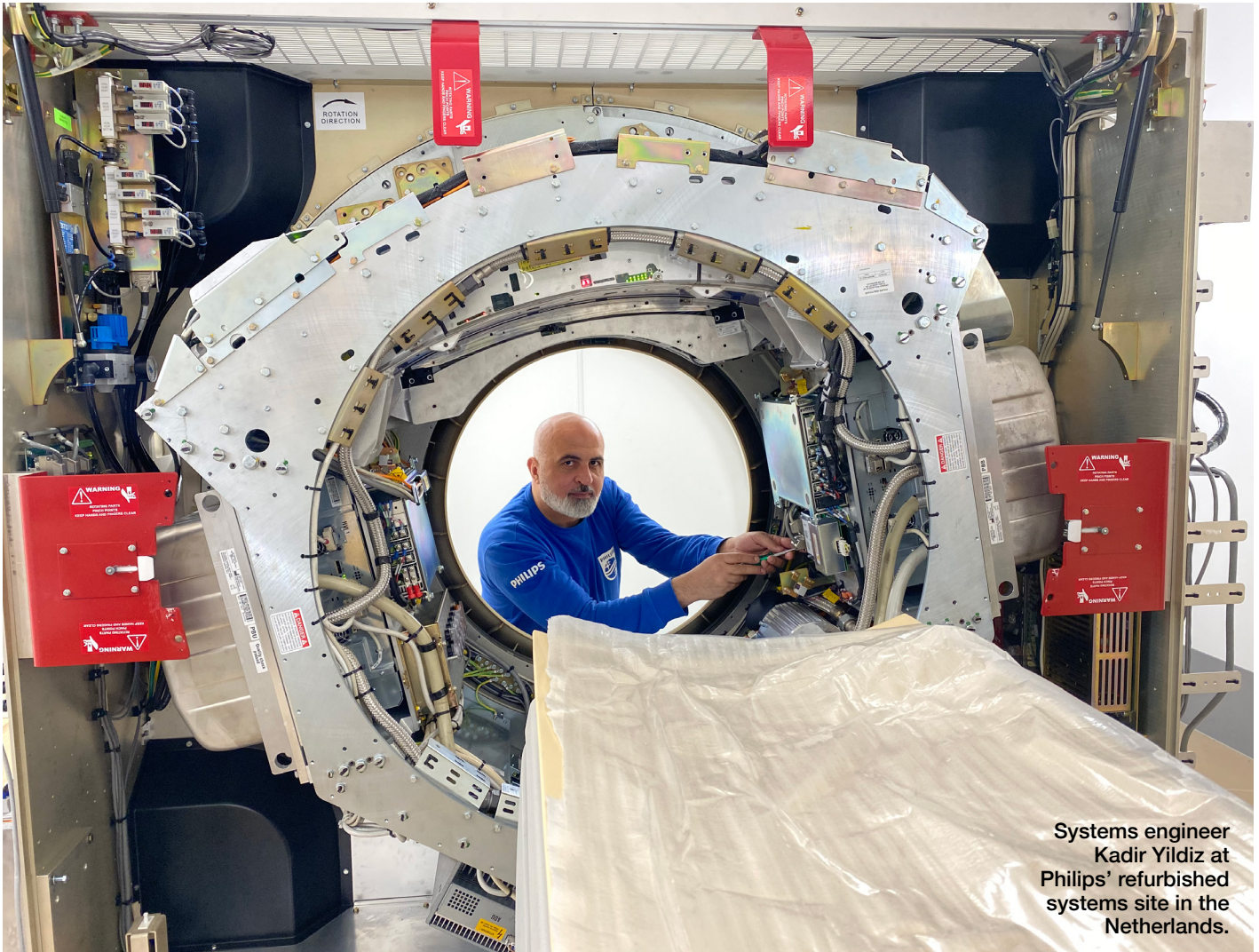


EMMA SCHNEIDER/SHUTTERSTOCK



**Mike Scott** is a former Financial Times journalist who is now a freelance writer specialising in business and sustainability. He has written for The Guardian, the Daily Telegraph, The Times, Forbes, Fortune and Bloomberg.





Systems engineer  
Kadir Yildiz at  
Philips' refurbished  
systems site in the  
Netherlands.

# HOW COVID-19 HAS BROUGHT CIRCULARITY INTO SHARP FOCUS FOR PHILIPS

With refurbished CT scanners in heavy demand from hospitals to fight the pandemic, the Dutch health technology giant is seeing dividends from its drive to close the loop on its medical equipment. [Terry Slavin](#) speaks to sustainability chief [Robert Metzke](#) about the confluence of climate action, healthcare and resource efficiency



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healthcare may not be a sector that springs to mind when it comes to tackling CO<sub>2</sub> emissions and bending the curve on our linear economy, but the intersection between climate change and health is a big preoccupation of Robert Metzke, head of sustainability at global health technology giant Philips.

Metzke points out that the World Health Organization has called the Paris climate agreement “the most important health agreement of the 21st century”.

Severe weather events linked to climate change are already testing the viability of healthcare systems, and have been responsible for causing hundreds of thousands of extra deaths and billions of extra spending.

It is a little-known fact that the healthcare sector is itself a major climate change contributor, Metzke points out, responsible for 4% of global CO<sub>2</sub> emissions, more than aviation or shipping.

Hospitals, which are one of Philips’ biggest customers for equipment like its MRI scanners, are also a significant emitter of potent climate pollutants such as black carbon, methane, hydrofluorocarbons and anaesthetic gases.

And, as we have seen during the Covid-19 crisis, with the vast amount of single-use personal protective equipment used in hospitals to fight the pandemic, huge generators of plastic waste.

Metzke says the stockpile highlights the failure of

“

**Even before thinking about designing a product we think how it has to be sustainable, how we can recycle it after use**



PHILIPS

Robert Metzke, head of sustainability at Philips.

circular business models to make inroads into the sector. The Netherlands-based company is offering sterilisable patient-monitoring cables as a service in some big hospitals in the US, he says, but such innovative business models are new.

“I hope the mountain of waste will make people scratch their heads and consider seriously circular models going forward... such as service models, where there’s an incentive to design cables and monitors that can be sterilised and then reused.”

### CLOSING THE LOOP

The crisis hasn’t affected the company’s ambitious goals to make its own operations more circular, Metzke said. By 2020 it aims to recycle 90% of its own operational waste and close the loop on all the large medical systems equipment it produces, extending circular practices to all medical equipment by 2025.

This involves rethinking products at the design stage, Metzke says.

“Even before thinking about [designing] a product, we think how it has to be sustainable, how we can recycle it after use. ... So it’s [about] modular design, and platform design is choosing different materials and so forth. And it’s the business model





Charmae Pearson assembles a ventilator motor at Philips' production site in Pittsburgh, USA.

around it,” such as offering MRI scanning as a service rather than selling scanners.

During the pandemic, this work has accelerated, as Philips engineers have been working around the clock to refurbish CT scanners, which have been in high demand for diagnosing Covid-19 – bringing down the normal waiting period from six weeks per scanner to two.

Metzke says the crisis has also prompted greater collaboration between members of the World Economic Forum's [PACE platform](#), a multi-stakeholder initiative to scale up action on the circular economy. Co-chaired by Philips CEO Frans van Houten and the Global Environment Facility's Naoko Ishii, PACE brings together companies, governments, environmental NGOs and foundations, including the Ellen MacArthur Foundation. Since plastic is one of Philips' biggest materials, Philips has committed to quadruple its use of recycled plastic to 7,600 tons by 2025 as part of the New Plastics Economy Global Commitment, which also comes under the PACE umbrella.

“One of the main chicken and egg stories in the past was that [suppliers] are not producing [plastic] with recycled plastics because there is not a high

**The interesting thing is that this crisis reshuffles the cards, and puts energy into the system to change the status quo**

demand for it,” he said. “So we are making these type of commitments for the next 10 years, together with other companies, to create certainty for the suppliers so that they invest in technologies, which drives up volume and drives down costs.”

This has been made harder in the last couple of months, as price differential with fossil-fuel derived virgin plastic has widened even further with the precipitous drop in oil prices, but Metzke said this illustrates even more the importance of collaboration.

“The interesting thing – and this may be a side effect of any crisis – is that it reshuffles the cards, and puts energy into the system to change the status quo. It's a great opportunity to reach out and work with partners on these agendas,” he says.





**When we say at Philips that we want to improve people's lives and at the same time respect planetary boundaries, we have to talk about circularity and renewable energy together**



PHILIPS

But he added that regulation is also needed, and welcomed the European Commission's new Circular Economy Action Plan, one of the main blocks of Europe's Green Deal, which sets out the EU's intention to be a global standard-setter for circularity, not only in the production of plastics, but in packaging, electronics and ICT; batteries and vehicles, textiles, construction and buildings.

The action plan proposes widening the Ecodesign Directive, which regulates energy-related products in the EU, to ensure that all products placed on the EU market stand the test of circularity.

Proposed measures include increasing recycled content in products, enabling remanufacturing and high-quality recycling, and incentivising product-as-a-service models, such as those embraced by Philips.

Metzke says the focus on circularity at Philips is complementary to the company's climate work. The company has been operating on 100% renewable energy in its operations from last year, and was the first in healthcare company to sign up to the Science Based Targets Initiative, aligned with a 2C rise in global warming compared to pre-industrial times. It has also [been](#) on CDP's Climate Change A List for the last six consecutive years.

Metzke pointed to a [study by the Ellen MacArthur Foundation](#) last year showing that 45% of global emissions come from how products are made and used, and how food is produced.

"When you move towards a circular model, that has impact on your logistics, how you move stuff around. It also has impact on the embedded carbon in the materials that you use." Tackling emissions

Philips is building solar-powered Community Life Centres in rural areas of Africa to improve access to primary care.

targets from such an end-to-end perspective is what is required by science-based targets.

"When we say at Philips that we want to improve people's lives and at the same time respect the boundaries of the one planet that we have, we have to talk about circularity and renewable energy targets [together]."

But at the same time, he acknowledged that it is far easier to measure progress towards sourcing green electricity, for example, than on designing greater circularity into its products.

A [lack of data and metrics](#) has been flagged up as one of circular economy's biggest challenges to overcome for it to reach scale.

And while there has been a lot of recent movement towards establishing circularity metrics, with separate initiatives by the Ellen MacArthur Foundation, World Business Council for Sustainable Development, and PACE, Metzke said it was important that they converge.

"Going forward, agreeing on a common set of metrics that are easy to understand, and really enable decision-making, is really important." ■



**Terry Slavin**  
is editor of Ethical Corporation





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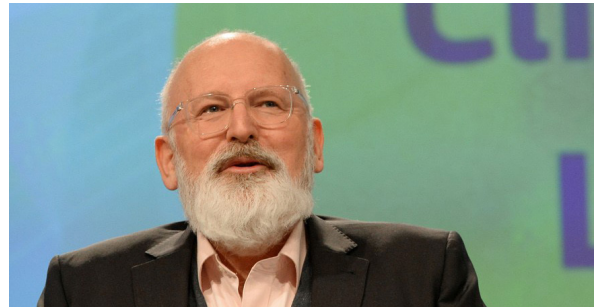
**'We have to move from shareholder to stakeholder value,' says UN Assistant Secretary-General**

Ethical Corporation's managing director Liam Dowd talks to Satya Tripathi, UN Assistant Secretary-General on building back better, moving from shareholder value to stakeholder values and more.

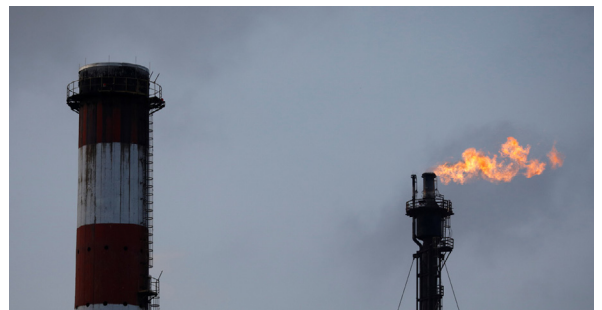
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