


The missing piece

Chemicals in Circular Economy



A woman with long dark hair and glasses, wearing a black jacket and black pants, stands in the center of the frame. She is holding a brown cardboard box in front of her. Behind her is a large, textured grey wall. A massive black circle is painted on the wall, partially overlapping a rectangular window. The wall has some red and purple graffiti. At the bottom of the wall, there is a brick base. The ground is a concrete sidewalk. In the bottom left corner, the text 'VictorASH' is visible.

6 Foreword

8 The Business opportunity in a circular economy

10 CASE: Apple

12 Product planning and design

14 CASE: H&M

**16 Supply chain management, transparency
and traceability**

18 CASE: Ikea

20 Legal compliance is not enough

22 CASE: Coop Denmark

24 Reuse and recycling

26 CASE: Sarp Industries



Designing and manufacturing products to be recycled is great. But there is one piece missing in the circular economy debate – hazardous chemicals.

Without proper attention to chemicals, circular economy will never work.

Foreword

THE CONCEPT OF CIRCULAR ECONOMY has long been a staple in the vocabulary of anyone who wants to come across as at least somewhat progressive. What has changed in the last couple of years is that this production model has started to gain traction with people who have the mandate to actually make it happen. Policymakers all over Europe, and elsewhere, are already in the drafting stage of several circular frameworks and a growing number of businesses are on the move too. Today, circular economy is more than just a buzzword.

ONE CRUCIAL, BUT OFTEN OVERLOOKED PART of a circular economy is the role of chemicals. As the progressives of the world seem intent on solving the problems of pollution and depletion of the earth's resources by simply increasing recycling, little attention is paid to the contents of the old products that we turn into new ones. The truth is that

today's chemicals legislations are not adapted for a sustainable circular economy, as many hazardous chemicals are unregulated and in widespread use. These chemicals fulfill thousands of different functions in all kinds of everyday household items all around us. And as these items are the very same we recycle and turn into new products in a circular world, it also means we are recycling their toxic contents.

Luckily, a growing number of brands and retailers are realising that, at the moment, legal compliance is neither a good benchmark for corporate chemicals management nor for a circular economy. In order to account for weak legislation and stay away from toxic chemicals in products and supply chains, many companies have internal chemical requirements that go beyond legal compliance.

The companies featured in this report – **Apple, Coop Denmark, H&M, Ikea and Sarp Industries** – are perfect examples of this. We are convinced that it is not a coincidence that these companies are in many cases market leaders in their respective industry. If your company is on the move towards adaptation of more circular business models, we believe this publication can help you gain some insights and inspiration.

AND POLICY MAKERS, there are important messages in this publication for you to take home as well: Stop focusing just on the quantity of recycled materials and start thinking about the quality. Create policies that favour sustainable innovation – not the opposite. That means picking up the pace and banning the use of obvious problematic substances and elevate the requirements for chemical trans-

parency. Today, the chemical information that follows a product in the world's supply chains is lackluster. At best, companies only have a vague idea of the contents of their products.

LOW CHEMICAL STANDARDS will only serve to alienate innovative and progressive companies from recycled materials altogether. Ask yourself:

How will a circular economy work if no one wants to buy and use recycled materials?

The business opportunity in a Circular Economy

In essence, a circular economy can be described as a change in the way that companies make profit. Instead of selling material volumes that are ultimately discarded in the trash, you sell material functions that may be used over and over in a perpetual cycle.

When you think about it, the existing linear economy based on selling volumes and wasting resources is actually ludicrous. Try explaining the rationality behind the concept of planned obsolescence to a child, for example. "That's right, we intentionally design many products with a short life, including light bulbs and printers, in order to force people to buy new ones". But this can only go on as long as virgin materials are available, and as long as society and its taxpayers accept paying for negative externalities such as waste and pollution. For how long will this be accepted?

In our society, the prices of raw materials and trash collection are increasing because of simple physical limitations. The resources available in the earth's crust are simply shrinking. The "take, make, waste" paradigm within the linear economy has led us to a critical point that also affects business, through higher commodity prices and higher volatility. This will lower margins and profitability for companies and increase consumer prices in the long run.

THE IDEA OF A CIRCULAR ECONOMY is to manufacture components, articles and products that can be perpetually disassembled and re-used, thus creating a no-waste society and minimising the strain on natural resources. To simply use and discard is no longer a viable option. To achieve this change, however, both businesses and society need to re-think the way we make profits and design products.

In business, sustainability is sometimes seen as a parallel activity – a necessary but nevertheless burdensome cost – not something that actually strengthens the business idea and profitability. In a sound circular economy, companies prosper due to environmental success, not despite it.

There is a need for a change in the business mindset, so that company interests, societal needs and environmental challenges are merged into one business idea. We should stop talking about the need to balance economical, environmental and societal interests, as there is no contradiction between the three.

CHEMICALS ACTUALLY PLAY A LARGER ROLE in a circular economy than one might first think. How so?

Since hazardous chemicals are common ingredients in all kinds of materials they obviously end up in recycled materials as well. This fact makes it virtually impossible to grow the market for recycled materials – the material transparency is simply too low for chemically progressive brands to want to re-use these materials in new products.

HAZARDOUS CHEMICALS IN PRODUCTS AND SUPPLY CHAINS are not only a real threat to human health and the environment, they also pose a reputational liability. A growing number of brands and retailers understand that hazardous substances mean exposing customers to a risk – or a perceived risk, which can be just as devastating for the brand. To account for this risk, many of the world's most well known brands have their own internal requirements stating which chemicals are allowed in their products, requirements that go beyond what is needed for legal compliance.

Unfortunately, except for very specific cases, recycled materials cannot meet such requirements today.

But wait a minute, you say. There are well known brands out there that turn their old products into new ones. Yes, that is correct. Apple, for example, even pays money for customers to bring back their old phones, which are then used to make new ones. But in this case, Apple is in full control all the time. It created the original phone and knows it fulfills Apple's chemical requirements. Hence the old phone can be used to make a new phone. This is called a closed waste loop. Closed waste loops are great, but they are still not enough to create a global circular economy.

THE WAY FORWARD IS INCREASED TRANSPARENCY on the chemical contents of all materials. This information should follow materials all the way to the waste phase. Used properly it will raise the price of recycled materials.

THE END GOAL IS TO ELIMINATE HAZARDOUS CHEMICALS from waste streams through design and innovation, not dilution and costly risk analyses. Strict risk approaches will only create a liability and postpone dealing with the root of the problem, which is contaminated material streams. Instead, the same requirements should be applied to all material streams, regardless of origin. The use of recycled material can only be profitable in the long run for a company if it fulfills the same criteria as virgin material.

Case: Apple

“The goal is to one day make our products using only recycled or renewable resources”

How does Apple incorporate the concept of circular economy into its business?

Apple is committed to finding ways to use less of the planet’s precious resources, and recover more materials for reuse. As part of this commitment, we recently announced a goal to one day make our products using only recycled or renewable resources, and return an equivalent amount of material back to the market to be used by us or others.

To meet this ambitious goal, we’re applying the same innovation that goes into our products into piloting new recycling technologies. We recognize this effort will require years of collaboration across different Apple teams and our suppliers, as well as with recyclers, but our work is already underway. While we transition to this new supply chain model, we are committed to maintaining our initiatives that ensure that the

materials we use in our products are sourced responsibly through strict standards and programs that drive positive change.

You have developed robots to help you disassemble your smartphones. Why?

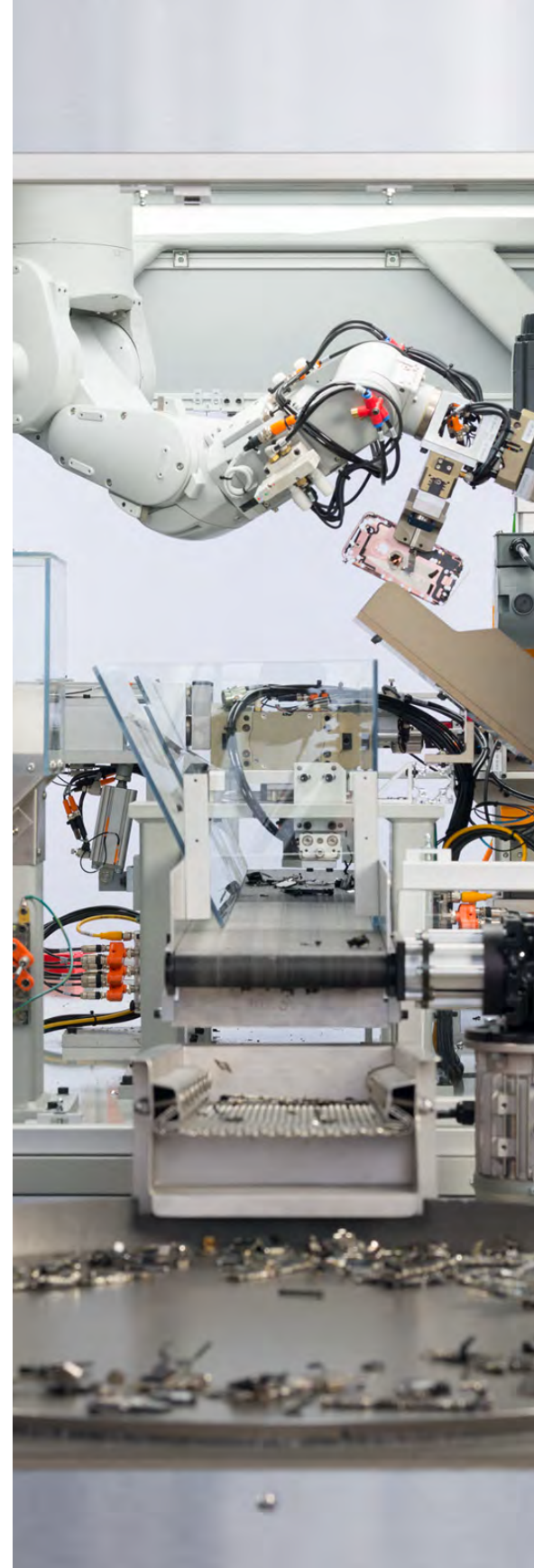
As part of our closed-loop goal, we’re working to recover as many materials as possible from our products and return them to the global supply chain. Existing techniques, such as shredding, recover only a few kinds of materials and often diminish their quality. There is a clear need for innovation when it comes to techniques that are able to separate and recycle complex mixtures of materials.

Based on the learnings from our R&D project “Liam”, we developed “Daisy” – our newest disassembly robot. Daisy removes

and sorts components and can take apart up to 200 iPhone devices per hour. This way we can recover materials that traditional recyclers can’t – and at a higher quality. By meticulously disassembling our products, we can direct components and materials to those recyclers who can recover the important parts. These materials will then be sent back into secondary materials markets, closing the loop on these materials and reducing the need to mine more resources from the earth.

Could you give examples of recycled materials that you use in your products?

We’re just getting started in our efforts, but we’ve already made some notable progress. This past fall, for example, we announced we have transitioned to using 100% recycled tin in the main logic board of iPhone —



including the new iPhone XS and XR, with no reduction in quality or performance. This one change will prevent the mining of over 10,000 tons of tin ore a year.

And with the new MacBook Air, we recently introduced our first computer with an enclosure made from 100% recycled aluminium. To do this, Apple had to create an aluminium alloy that delivers the same strength, durability and finish without mining any new aluminium from the earth. Instead we use shavings of recaptured aluminium that are re-engineered down to the atomic level. The result is a beautiful and strong enclosure, and a product with 47% lower carbon emissions compared to the previous generation.

Do you see any financial benefits of incorporating circular economy into the core business idea?

Upfront investments, like Apple’s development in robots like Liam and Daisy, are necessary to achieve circularity. Like everything at Apple, this effort is driven by innovation. Through more efficient recycling technologies and other innovations, we hope that one day we can stop mining the earth altogether.

Product planning and design

A smart design is the most critical stage in a product's life cycle. The fate of the life cycle is determined here, right at the start. The most cost-effective approach is to select the appropriate materials and chemicals right at the drawing board, before the product even exists. By doing this, toxic waste can simply be "designed out" and instead replaced by resources and products that can be utilised by somebody else.

THE GREATEST OBSTACLES TO SUCCESSFUL RECYCLING are actually the original design and lack of information about what chemicals were added to the materials from the very beginning. By demonstrating knowledge and transparency you add value to the product. Products and materials that are designed to be recoverable, reconditioned and upgraded have around twice the value of products and materials that are not, as they can be sold several times.

Product planning and design in a circular world is about foreseeing and meeting the life cycle management challenges of many different groups of people that will come in contact with the product, such as retailers, consumers and recyclers. It should also take into account the various services the product will require, such as spare parts, components and repairs. For instance it is at this stage a designer can enable dismantling, by making it easy to separate different materials that can then enter the appropriate waste streams.

It doesn't take a rocket scientist to understand that by decreasing the hazardous content of a product, you increase the possibilities for recycling and success in the aftermarket. You also reduce the need for virgin raw materials and the energy costs to produce them.

ELIMINATING HAZARDOUS SUBSTANCES FROM PRODUCTS could lead us closer to solutions to many other environmental threats as well. When demand for virgin materials decreases due to effective and non-toxic life cycles, the pressure on natural resources will most likely decrease. The novel idea that the circular economy presents is that good design is not only environmentally and morally good; it's also more profitable. Bad design, on the other hand, is expensive as it only creates useless waste at the end of a product's life cycle.

CHEMICALS MANAGEMENT SHOULD HAVE A HIGHER PRIORITY on the corporate agenda. Chemical issues cannot be the responsibility of a supporting department that has a weak mandate within an organisation. This problem can be illustrated by the fashion industry. Who do you think has the last say when designing a product within a fashion company – the designers or the chemicals department? The designers, of course. Progressive fashion companies have solved this by either educating their designers about chemicals, or simply giving them a set of pre-approved materials to work with.

In such cases, chemicals have gained higher priority in strategic business decisions and organisations have created policies that guide towards a more proactive approach.

DEPENDING ON COMPANY GOALS, chemical issues can be prioritised at different levels. At the lowest, so-called reactive level you simply follow regulations and adapt on the fly. By contrast, at the highest and most ambitious level you actively seek out green chemistry and sustainable materials that position the organisation for the circular economy. This kind of work means that you are working with positive selection of chemicals. Simply replacing an undesirable chemical with another that is not yet regulated, is of similar quality or poorly investigated, is not enough.

PHASING OUT UNWANTED SUBSTANCES from production should be followed by product development that aims to meet the needs of a circular economy. The solution is not necessarily another chemical. A substitute for a flame retardant could be a sprinkler or a material that is not flammable, such as a metal. Instead of using hazardous plastic softeners such as phthalates, it is often smarter to use another type of plastic or a material that is naturally soft.

Other solutions can be found by thinking outside the box and questioning dogmatic preconceptions, behaviour and routines.

Some outdoor jackets with hazardous fluorinated PFAS materials are often sold with arguments that the jacket can handle heavy rain for up to two weeks. But who needs this jacket? Even in places where there is heavy rain most people will normally not stay outside 24 hours a day for two weeks straight. If this is you, you should probably start looking for a wet suit instead.

CHANGING BEHAVIOURS, CULTURES AND RAISING CONSUMER awareness may sound frustratingly vague, but shouldn't be sneered at. Removing over-the-top features from products, while simultaneously communicating the environmental reasons for doing so, can work wonders.

Case: H&M

“We need to be certain that the chemicals we use are safe”

Why is it important to focus on chemicals in a circular economy?

A circular economy is so much more than just recycling whatever we can. We need to be proactive and really know what chemicals we are using in our products, otherwise toxic chemicals will circulate around and around endlessly. We therefore need to be certain that the chemicals we use are safe.

For H&M, it is also completely necessary to focus on chemicals in order to meet it's ambition of becoming 100 percent circular.

Does H&M think about chemicals right at the product planning stage?

Yes. We have initiated a process of developing and implementing a positive list that will make it possible for us to consider chemicals right from the design phase. The aim is to design a garment with only preferred chemicals from our positive list.

This method is not fully implemented yet, but we are getting there.

What is the reason for implementing this positive list?

Well, until fairly recently, we were very keen on restricting hazardous substances in our products – and we still are – but lately we have changed focus. Instead of focusing only on what not to use, we now focus on what we should use.

And the way we do this is by working with positive lists, which are essentially lists that specify which chemicals we should use in our products. A couple of months ago we re-launched this method with clearer criteria for the chemicals. This was done together with several other well-known fashion brands and a third-party certifier that uses a hazard-based screening method to evaluate the chemicals. I should also mention that our list is public for anyone to see.

Why did you make this change?

To be able to phase out hazardous substances you first need to find something that is better, and in this process we, and many other brands, came to the conclusion that a hazard-based screening method really helps. With this screening process we can select which chemicals to use fairly easily, and by using a third-party certifier it makes the whole process comparable and more trustworthy in our opinion.

We thought about developing our own method of evaluating alternatives, but we truly believe that cooperation is the way to drive change in this matter. The fashion industry is leaning more and more towards sharing methods like this, and we think this is great. Hopefully, in the future, we will agree on one single method for all of us.



Supply chain management, transparency and traceability

Chinese whispers is a classic game for children where the first person in a line whispers a sentence to the next person, and so on. When the last person in line repeats the sentence they heard it is likely to have changed drastically. This is often exactly how chemical information and transparency in the supply chain are handled.

Since a product consists of components that are produced and assembled by many different suppliers in the supply chain, it is impossible to communicate the chemical content down the supply chain without proper information from the previous suppliers.

THE NEED FOR SYSTEMATIC CHEMICAL CONTROL up and down the supply chain is already a priority for many companies. Unsurprisingly this need will only grow in the future as recycled materials are being circulated back into the production loop.

There are mainly two activities that are needed in order to approach the circular economy from a chemical point of view:

1. *Increase knowledge of the composition of products, and*
2. *Phase out chemicals that do not fit within a circular economy.*

If you don't know what chemicals have been added or used during production you can't claim that your products are safe. If you want to prime your company for a circular economy, and at the same time reduce your business risk: Gain better control over your products, improve content declarations, and increase the competence and reliability of those upstream in your life cycle chain. This will increase your product's recycling value.

SOME INDUSTRIES HAVE ALREADY CREATED EFFECTIVE SYSTEMS for transferring information between suppliers and users in the supply chain. The IMDS and BOM-check databases are already used in the automotive industry and the electronic industry respectively, and relevant parts may be accessed by everyone in the entire supply chain. These industries have an advantage and are in general better equipped for the future requirements of transparency. Having said this, there is nothing preventing individual companies from taking these initiatives.

SYSTEMS LIKE THIS CAN BE USED to include extensive chemical information. The barcode system is another such example. It is technically very easy to include chemical information in a system like this; all you need is the information. The challenge lies in implementation and standardisation.

Notwithstanding the challenges, a fully developed barcode system or the like that includes chemical information holds countless possibilities. Imagine, for example, consumers being able to scan the barcodes of everyday products with their smartphones and making more informed purchases. This future is not so far-fetched – the only thing lacking is the chemical information.

Companies that are well equipped for the future understand that this change is coming and will start making new kinds of demands,

allowing designers and suppliers to use only well-known chemicals and materials that are suitable for recycling and/or composting.

This change is actually happening already, as many brands with big purchasing power are pushing for more and more chemical transparency in the supply chain. By putting pressure on suppliers to increase chemical transparency and use safer alternatives, these companies serve as role models and pave the way for other, smaller companies to follow suit. They will also be more profitable than their competitors when consumers can act on the chemical content and choose safer products.



Case: Ikea

“A circular economy is both a responsibility and a business opportunity”

What does a circular economy mean to Ikea?

For us, a circular economy is both a responsibility and a business opportunity. And the way we go about this is to work towards a business that is circular in all aspects. In everything, from how we develop products and services, source materials, develop supply chains and set up logistics, to how and where we meet our customers.

As of now, we have 64 percent renewable and 8 percent recycled materials in our entire product range. Our aim is to use only renewable or recycled materials by the year 2030.

What are the challenges of using more recycled materials?

Well, Ikea does not accept that recycling should happen at the expense of chemical safety – we want to secure a toxic-free circulation of materials. When we use recycled materials that are not from Ikea the challenge is to find secondary materials

with the right quality that do not contain harmful chemicals.

Only one million tons of our recycled materials come from our own stores, so we must learn how to access external waste and reuse it. However, sourcing recycled materials in the quantities we need for our business is difficult due to the lack of infrastructure in many markets. Lack of synergies in legislation and working processes between markets further complicate the possibilities to secure high volumes of these materials.

Is there anything in particular that legislators should think about regarding recycled materials and a circular economy?

Yes, one key contribution would be to enable transparency and availability of recycled materials by setting up a harmonised cross-border legislative framework.

It would also be beneficial to set simple reporting criteria, limiting administrative

burdens, to promote compliance and give businesses of all sizes, big and small, the possibility to participate in the transformation.

What lies in the near future for Ikea in terms of a circular economy?

Our starting point for moving towards becoming circular is our commitment to offer 100-percent circular products and use only renewable or recycled materials by 2030. This means that in the near future we will try to develop all products according to our circular design principles. This includes, for example, designing for an expected lifespan, for recycling, for the use of renewable or recycled materials, and for production.

Right now, we are also exploring how to track legacy chemicals, and one of our commitments for the future is to join forces with others to develop new solutions for dealing with chemicals during reuse, refurbishment, remanufacturing and recycling.



Legal compliance is not enough

20

Just as hazardous man-made chemicals are complex and wide reaching, so is the legislation set up to regulate them. This was not always the case. For decades chemicals were hardly regulated at all, with some specific exceptions such as pharmaceuticals, pesticides and food additives.

The vast majority of chemicals could be used without the need to provide any information about them, their intrinsic properties or the risk of using them. If a substance was identified as problematic, it was more likely to be a result of coincidence than systematic scrutiny. No general testing of chemicals for harmful properties was required.

This has changed in recent years. The EU has enforced REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals), a comprehensive legal framework that addresses all chemicals in

use, and requires companies that market chemicals to present a set of test data. The US equivalent, TSCA (Toxic Substances Control Act), set some basic requirements but is much more limited in scope. In many other parts of the world there are other regulations in place to address chemicals, some aiming to be similar to REACH or TSCA. There are also many product-specific regulations in the EU and in other regions for controlling hazardous substances in products such as electronics. The ambitions vary, but generally speaking the EU sets the highest bar.

BUT EVEN THOUGH LEGISLATION HAS GONE from being extremely rudimentary, to at least trying to limit the use of hazardous substances, it doesn't mean that legal compliance guarantees automatic success in the circular market. In fact, this is far from the truth. Even in the EU, which in many ways has the most ambitious chemical regulation in place, substances with hazardous properties are still in widespread use. This is because regulation moves slowly and it will take many years before REACH includes all the substances it intends to regulate. In addition, REACH does not fully cover the chemical content in articles that are imported into the EU. This means

an enormous amount of hazardous chemicals are entering the EU via products that will be used and finally become waste in the EU.

The regulatory system for chemical control is therefore not a reliable guide for sustainable business or for identifying which substances are compatible with a circular economy.

THIS IS WHY CHEMICALLY PROGRESSIVE COMPANIES are setting the bar higher than legislation and enforcing their own chemical requirements for products and supply chains. The number of such companies with their own chemical standards is increasing, and today represents sizeable chunks of their respective industries.

Legislators might be tempted to make exceptions for hazardous chemicals in recycled materials in order to meet recycling goals and high circular economy ambitions. This will not only result in a growing supply of recycled materials containing hazardous chemicals, but it will also hamper the market potential for second-hand materials as more and more companies ask for materials that do not contain hazardous chemicals.

21

THE SUCCESS OF THE CIRCULAR ECONOMY LIES instead right at the beginning. In order to know what is in recycled materials, we need to know what went into the virgin materials. Recycled materials need to comply with the same requirements as virgin materials in order to make them attractive in the marketplace. This is achieved with strong chemicals legislation and a high level of transparency.

Case: Coop Denmark

“We try to go the extra mile and actually do more than what the law requires”

Coop applies a stricter approach to chemicals than the legislation calls for. What is the business logic behind that?

A few years ago we asked our customers which topic they felt was the most important for Coop to tackle. The number one thing customers mentioned was unwanted chemicals in products, and since Coop is a member-owned cooperative, these concerns need to be dealt with. But apart from that – there are also strong business arguments. Danes in general are very concerned about toxic chemicals. If Coop can show that it is trying to go the extra mile and actually do more than what the law requires, then I think this can be an important factor when consumers choose between our competitors and us.

Coop recently ran a petition campaign in Denmark, calling for stricter chemicals legislation. Why did you do this?

One thing that separates Coop from other retailers is that it wants to be part of the public debate and express its opinions, and even try to affect policymakers. For example, Coop has criticised the authorities for soft legislation on issues such as animal welfare and tobacco. So this approach applies to a wide range of topics, not only chemicals. Because of this, Coop's media activity, campaigning and presence in the public debate actually resemble that of an NGO many times.

The campaign resulted in Coop handing over a bill that legislators signed. How come the campaign was so successful?

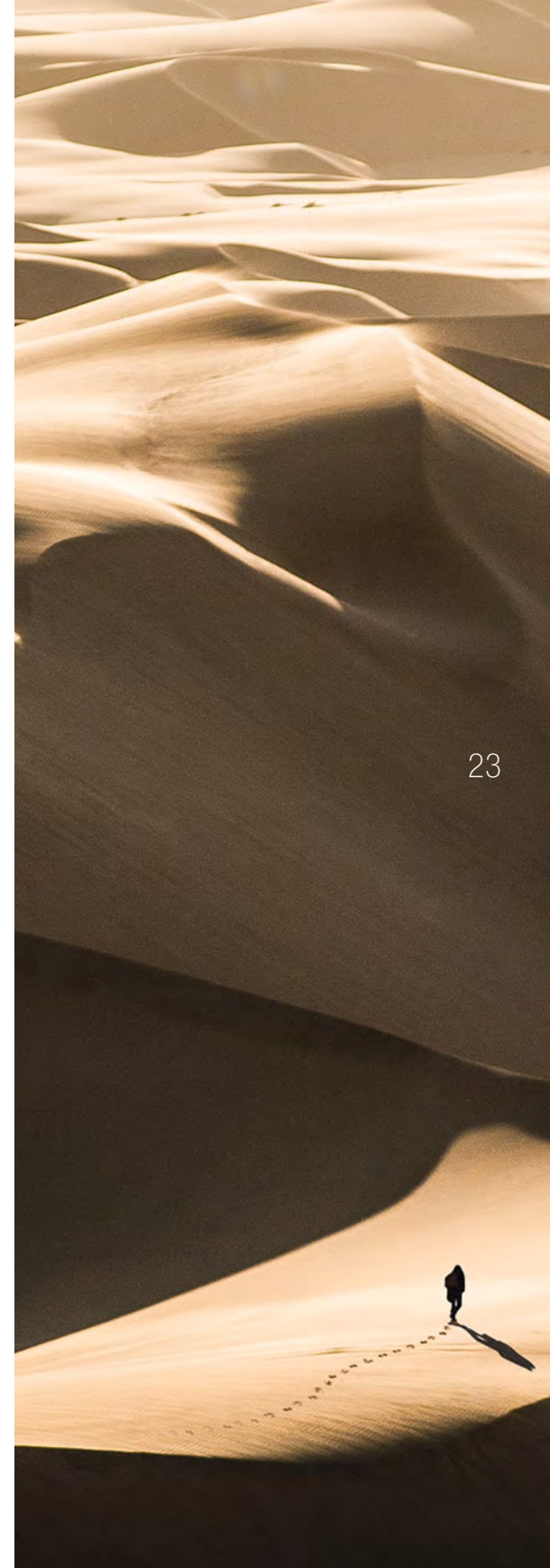
I think it was because we managed to alert the public about how important chemicals are, without using any scare tactics. Instead, the campaign leaned on science and was presented in a balanced way.

But isn't your core business idea to sell food items and make money?

Yes, but I have never seen any proof that these campaigns have hurt Coop's sales. On the contrary, we have a strong belief they actually supports Coop's reputation and our consumers' trust in us, and that they give us a competitive advantage. But it has taken some time to get to this point. Now, when Coop speaks up publicly, consumers know we are not simply doing it as a PR stunt, but that we are serious about the issues we bring up.

Could other companies learn from your approach?

There are already well known brands out there that have similar approaches. Look at H&M, Lego and Ikea, for example. Three very strong brands with a really good reputation, especially in terms of chemicals. But like us, they have worked for many years with these questions. There needs to be a true sincerity when a brand starts talking openly about chemicals, and that takes time to establish. Coop has tried to do more than simply comply with legislation for over 50 years. You need patience. At the moment competition in the Danish retail market is very tough, but I believe that Coop's honest approach to chemicals and other important issues will help see it draw the longest straw in the end.



Reuse and recycling

In today's society it is common to see products claiming to be 100 percent recyclable, or made out of recyclable materials, and so on. While this is in general very positive, it actually shifts focus from the really important question: What is in the recycled material?

MANY WASTE STREAMS CONTAIN HAZARDOUS SUBSTANCES and should not be recycled without a prior decontamination step.

In current business models, recycled materials struggle to be competitive with primary raw materials markets. This is often due to the fact that recyclers cannot deliver the level of material transparency that many brands are asking for.

RECYCLING MARKETS CAN ONLY BE SUSTAINABLE if they can assure that recycled materials do not contain toxic substances. Willingness to support the development of non-toxic material cycles will thus not only protect health and the environment but will also enhance the quality of secondary raw materials and boost recycling markets.

Generally, we have no prior knowledge about the final use of a recycled material. This is why it is extremely important to apply a

hazard-based approach, which only takes into consideration the intrinsic properties of the waste.

WHEN WASTE IS RECYCLED we can make a distinction between safe loop and unsafe loop systems. Safe loop systems are either closed loop systems (the material is completely traced and reprocessed for the same purposes) or controlled loop systems (the waste material is completely traced but can be reprocessed for different purposes). In both cases substances of concern are known and flagged so they can only be incorporated for allowed uses.

Unsafe loop systems, on the other hand, consist of waste materials from different sources and for different applications that have already undergone an initial stage of mixing, blending and/or shredding. In this case it is impossible to trace substances of concern and thus to ensure that the recycled material can be safely used. Unfortunately, this is the most common practice prior to recycling.

THE CONSEQUENCE OF MIXING/BLENDING/SHREDDING WASTE before recycling is dilution of the substances of concern. Safe removal of the substances becomes technically and economically impossible and ultimately increases the background level of unwanted substances in all goods.

Maersk Line, which is a world-leading shipping line, uses enormous amounts of steel of different grades in its ships. The grade and composition of the steel varies depending on whether it is used on the deck, in the engine, in propellers, or the hull. By carefully documenting each piece of steel, each bolt or rivet, Maersk has calculated the second-hand value of the ship is increased by at least 10%. When the ship is finally scrapped, the components can be used in an optimal way.

Unfortunately, there is a trend to focus more on recycling targets than on eliminating hazardous chemicals. Recycling targets should never be achieved at the expense of health and the environment. The risks of chemical scandals due to poor, low-cost recycling practices can be avoided for the future.

LEGALLY, IN ORDER TO INCENTIVISE HIGH-QUALITY RECYCLING, there is a need to avoid creating a two-tier system between virgin and raw materials, or between products and articles imported from the EU and those imported from elsewhere.

The same rules should apply – recycling should never be viewed as a low-cost solution. It might sound contradictory, but setting identical, strict rules for recycled materials will help them compete with virgin materials.

IT IS A FACT THAT REGULATION DRIVES INNOVATION, and recycling is no exception. Providing clear guidance in the shape of strict regulation would eventually be beneficial for brands, suppliers and consumers. Putting the appropriate legislation in place is not a burden, it will provide clarity and is essential to establish a circular economy.

Fact box: What about incineration?

In this report we do not include incineration in the term recycling, even though some refer to incineration as energy recycling. The reason we consider it important to keep the terms apart is because incineration of waste means the resource is lost.

What's more, it contributes to climate change and waste that contains hazardous substances, for example chlorine and persistent pollutants are converted to HCl and dioxins when incinerated. Keeping all this in mind, ChemSec acknowledges that in certain circumstances incineration is needed to eliminate unwanted substances from material streams and to avoid landfill.

At these times, however, it should be done using the best available technique to reduce pollution. It is crucial that all waste management parties contribute to solve this complex issue in the most beneficial way for human health and the environment, using the most appropriate technique for each waste category.

Interview with Cédric L'Elchat, CEO

Case: Sarp Industries

“There is a need for incentives that encourage the quality of recycling, not the quantity”

26

How do you know which materials contain toxic substances and which do not?

Since we are experts in recycling hazardous waste, people only come to us when they are certain that materials contain hazardous substances, so that takes a large part of the guesswork out of it. In those cases where we can't get the complete picture, we look at the origin of the waste and the processes it has likely gone through. This gives us an idea of the kind of chemicals that are present in the waste. Sometimes we actually have to convince customers that we should take care of materials that are allegedly non-toxic, since we know from experience that these materials usually contain hazardous chemicals.

Does the recycling industry have any use for more information about the chemical content of goods?

Yes, at Sarp we are always looking to extend our knowledge. That's why we are really pushing for things like Echa's waste database*. An initiative like this will greatly help to push all producers of materials to increase their transparency about chemicals of concern. Of course, there's a widespread reluctance to share this information, not only from the affected companies but also from politicians because it will obstruct many recycling goals. And they are probably right – it will. The problem with these politically ambitious recycling goals is that they are set without any concern for what is technically and economically feasible at the moment.

So it's impossible to achieve a circular economy free from hazardous chemicals?

No, not at all. Right now we have a great chance to change the business model and look towards innovation. There are many great techniques out there but there is a reluctance to accept the initially higher cost. But looking ahead, if we want to get completely rid of toxic substances in recycled materials, there need to be incentives like this that encourage the quality of recycling, not the quantity.

*In 2018, there was a EU proposal that the European Chemicals Agency should build a database including all EU Candidate List chemicals in all products placed on the EU market.

What kind of changes would you like to see in production processes in order for Sarp to deliver even better, non-toxic, recycled materials?

The dream we have, and that I think we share with many recyclers, is to have closer relationships with producers of goods so we can plan for waste treatment right from the start. The aim of this relationship would not be simply to allocate legal or financial responsibilities for the waste, but rather to improve the way we can recover and recycle products. We could, for example, point out substances and components that are problematic from a recycling standpoint right at the design stage.

What should legislators think of in terms of a circular economy?

They should not only consider the amount of materials being recycled, but more the quality of recycled materials. Decontamination is essential when dealing with materials containing substances of concern. At the moment, everybody is focusing on what proportion of materials is being recycled and how to increase this, without looking at what we mean by recycling and the quality of the recycled products. This situation just opens up the door to bad practices and cutting corners.



AS MORE AND MORE CORPORATIONS ARE MAKING GREEN PLEDGES FOR THE FUTURE, the notion that there is a contradiction between being sustainable and profitable at the same time is becoming increasingly outdated.

This is especially true in a circular economy, which should be viewed as a golden opportunity to combine business opportunity with corporate responsibility. In this publication there are portraits of several companies making the journey towards circularity right now. Naturally, this transition will not happen overnight. There is a lot of work to be done.

THE MOST IMPORTANT THING is to avoid hazardous substances in products and processes altogether – preferably right from the design stage. Simply following legislation is not enough as there are many substances in widespread use that are not fit for a circular economy.

ACCEPT THAT NOT ALL MATERIALS SHOULD BE RECYCLED. This follows on from the fact that many substances that are legally OK to use are in fact hazardous. It also applies to so-called legacy substances, which have been found unfit to use but are still present in many materials with long lifecycles.

REGULATION NEEDS TO MOVE FASTER, not least to avoid creating “new” legacy substances in the future. A circular economy and progressive chemicals legislation go hand in hand – one cannot prosper without the other. Strict legislation will not only help avoid legacy substances, but it will also help drive the innovation of new, safer alternatives to hazardous chemicals.

chemsec.org

