Circular economy

Business with new values

Teknikföretagen

Contents

TEKNIKFÖRETAGEN

Circular economy: "A new way of creating value"

Teknikföretagen sees long-term and strategic advantages in working towards circular business models – and many of the member companies do it already. But the conditions differ between different industries and companies. The starting point for political proposals aimed at spurring on the transition to a circular economy, must be that Swedish companies act on a global market.


KLAS WÅHLBERG

"Consumption patterns change over time. By evaluating global mega trends, opportunities increase to anticipate changes and thereby ensure continuous profitability. To plan for circular economy is an opportunity to achieve increased profitability, better competitiveness and new future innovative offers," says Klas Wahlberg, CEO at Teknikföretagen.

For industry actors, a circular economy means achieving higher resource efficiency and extending the economic relationship with the customer. Technological development is an important driving force. Businesses are becoming more circular, for instance by offering the customer maintenance, repairs, software updates, new types of service offers and the possibility to return products.

Circular business relationships are developed through customer behaviour, technological development and product use. Knowledge and knowledge sharing between industries is a prerequisite for developing commercial offers for resource efficient and circular business models. Innovation clusters, and supporting strategic initiatives for increased cooperation between established industry and start-ups, are key to the development of circular business models. For this, testing and demonstration facilities play an important role. Teknikföretagen also believe that strategic innovation programs, implemented through public private partnerships, are important efforts to develop more circular products and production systems. In addition, the public sector procurement processes should aim for a resource-efficient society in conjunction with sustainable technology development.

"The transition to a circular economy will happen at different paces, and in many different ways, totally dependent on the functionality of products, their use, material complexity and lifespan. The conditions for companies differ, depending on the type of product that companies bring to market and who the customer is. Professional buyers often have a strategic and long-term relationship with suppliers, ensuring better conditions for thinking long-term," says Elinor Kruse, who is responsible for environmental affairs at Teknikföretagen.

Teknikföretagen considers free trade to be a prerequisite for circular economy and resource efficiency. Without free trade, circulation of all forms of resources in the global trade system is hampered and made more complicated. Products are, to a large extent, used in the markets they are intended for, and rarely sent back to Sweden for disposal. One example is the EU waste legislation, where broken products are classified as waste, which constitutes an obstacle to trading with second-hand products.

"There are major differences regarding circular offers between the export industry and local businesses. The export industry has customers all around the world, which means that how other markets view and develop regarding these matters is crucial for businesses to become circular beyond Sweden alone. What happens to a product in other countries is dependant on many factors, including the business climate and access to material resources in the local economy. Therefore, we call for a strategic mission for the Swedish foreign authorities to monitor and report on initiatives and political developments in the area of sustainability and circular economy, as well as ensuring that this information reaches the Swedish technology industry," says Klas Wåhlberg.

Plastic is an important material in advanced technical applications. Teknikföretagen's members are active in this area and have increased their efforts to use more recycled material. In 2017, Electrolux used more than 5,000 tonnes recycled plastic. Volvo also recently announced their ambition that by 2025, at least 25 percent of the plastics used in new Volvo cars shall be made from reused materials. The initiative was immediately praised by Erik Solheim, Head of the UN Environment Program.

"As long as the linear economy has a high profitability, businesses will work with small-scale circular models, for instance through innovation projects and demonstration of future circular business. To develop circular offers within the industry requires complex change processes with great business opportunities," says Klas Wåhlberg.

A clear Swedish vision for a resource-efficient society is an important signal for the development of industrial solutions that have international appeal. Global agreements and international standards for products traded globally need to be developed. The global collaboration within Agenda 2030 is an important platform for industrial development within resource efficiency, and in the long-term, the circular economy. Regulations should be based on the vision of a sustainable society, and the environmental legislation needs to be renewed in line with technology development and globalisation.

To find out how the member companies of Teknikföretagen view the circular economy – and what potential there is to find business models for a more circular future – we have talked to some of them.

CONTACT:
Elinor Kruse,
Responsible for environmental affairs,
Teknikföretagen


ELINOR KRUSE

"For industry, the circular economy is about reaching a higher resource efficiency and prolonging the economical relationship with the client."

TEKNIKFÖRETAGEN

TEKNIKFÖRETAGEN

- Teknikföretagen is one of Sweden's largest employers' organisations with 3,900 member companies accounting for one third of Sweden's exports.
- Among the members are global companies like Ericsson, Scania, ÅF, ABB and Volvo, but most are considerably smaller. They have in common that they all develop world-class goods and services, and almost all sales compete on a global market.
- Our mission is to promote the international competitiveness and long-term profitability of our members.
- Teknikföretagen's environmental work focuses on issues that the companies have in common, and where political decisions affect the future of the companies.

REQUEST CIRCULAR SOLUTIONS

"By the middle of this century, the world's population is expected to increase to about ten billion people and the world economy will be around three times bigger than today. As soon as 2030, around another three billion people are expected to leave poverty and be included in the global middle class. This enormous increase in consumption will put even greater pressure on natural resources and ecosystems. It's in this world Sweden's businesses and Sweden as a small export country should be competitive. Global markets will demand smart, circular solutions."

(SOU 2017: 22 'From value chain to value cycle – how Sweden will achieve a more circular economy')

CIRCULAR ECONOMY

"Circular economy can be seen as a metaphor for an economy that functions within the planetary boundaries. It is an economy where waste to a large extent is not produced, but resources are retained in the societal cycle, or in a sustainable way returned to nature / ... / In the circular economy it becomes relevant to talk about users rather than consumers, and value cycles rather than value chains."

(SOU 2017: 22 'From value chain to value cycle – how Sweden will achieve a more circular economy')


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HUSQVARNA BATTERY BOX

"A way to explore the future is to build it"

If all gardeners each buy hedge clippers, a chainsaw, a trimmer and a blower, we will have lots of machines – most of which will remain unused for most of the year.

Is there a functioning business model where people rent or share tools instead, thought the creators behind the innovative solution from Husqvarna: Battery Box.


PETRA F SUNDSTRÖM

"One way to explore the future is to build it and investigate what happens. And that's how Battery Box was conceived. We wanted to understand the circular economy better and how it affects us," says Petra F Sundström, Director Idea and Innovation Management at Husqvarna Group.

Husqvarna Battery Box is an 8x3 metre unmanned and web-connected tool shed consisting of 30 electronic lockers. Each locker contains one battery-powered garden tool (hedge cutter, chainsaw, blower, trimmer) that can be booked via a mobile app for SEK 350 per day. The same mobile app is used for payment, accessing instruction manuals, and to open and close the storage locker when picking up and leaving products.

"We believe customers want to use products without always buying them. And that's what we set out to explore: What happens when the customer wants the functionality of the product, but not necessarily the product itself. How can we, as a company, act to meet this need?"

The pilot project is part of Husqvarna's sustainability agenda, where the goal is to increase the proportion of silent and battery-powered products in densely populated areas. The aim is also to test the technology and learn more about customer behaviour, revenue opportunities for retailers, as well as determine if the market is ready for this type of service. In May 2017 – after a record-breaking development of the product itself – Husqvarna Battery Box was placed at the shopping centre Bromma Blocks, 15 minutes west of inner-city Stockholm, close to large residential areas.

"We had some absolutely astonishing reactions from customers. Those who used the Battery Box loved the solution, and almost everyone reviewed it in the app. I have never been involved in anything generating such ecstatic reactions," says Petra F Sundström.

She is careful to emphasize that it is a pilot project, which so far is only at the trial stage. But she is convinced that the circular economy is about to break through – and that it will require new solutions from companies. Initiatives like Battery Box can also be a future solution contributing to the UN Sustainable Development Goal 'Responsible Consumption and Production'. Therefore, it is necessary for companies like Husqvarna to dare to try new models, even though it takes time before these projects become profitable in themselves.

"The circular economy might not generate financial value and profits today, but to sit back and wait, is not a good solution. We see a clear trend emerging from all surveys we conduct: This is coming, and we need to be persistent. And that's how it's been many times for us. The robotics market took 25 years to grow large. But that is one of the strengths of being a large company, to be persistent in areas of innovation where we're ahead of the game."

She believes that within circular economy, there has been more talk than action – both on the part of industry and consumers. At Husqvarna it is clear that consumers still have a 'need-to-have' desire for the products themselves, however she is also convinced that people will want to rent and borrow products to a much larger extent in the future. For the circular economy to really break through, there must be an interplay between companies and individuals.

"The shift will not happen until the solution exists. And the solution must be there when the shift happens. There is some potential in driving this shift. If you place these boxes close together in a city, that will drive a change in consumer behaviour. Customers look favourably upon it, we know this based on our market surveys. They are positive about this change. But it won't happen overnight. We have to offer the possibility of change. Or else someone else will."

Internally, the Battery Box project has shown Husqvarna that it is possible to carry out what appears to be big and crazy ideas in a short space of time – and that it is possible to change the whole business idea of a company. It has also increased understanding for what the customer needs and wants, and what Husqvarna could do to meet these in the future. The project has also meant added value for the company in the form of marketing.

A circular business model can also benefit traditional sales. An example that Petra F Sundström mentions is the ski producer Atomic, that has increased sales of downhill skis by making sure they are well represented at ski rental outlets.

"I don't think we need to be a smaller player in the circular economy, but rather the opposite. We can get more people to use our products if we offer this type of services. If we can be where the customer wants us to be, and offer the possibility to rent our products, then maybe they will choose our products. Then I believe we can drive profitability at a greater scale than today."

HOW IT WORKS

- After downloading and registering in the mobile app 'Husqvarna Battery Box', the customer can book one of the 30 tools (chainsaw, hedge clipper, trimmer or leaf blower) for SEK 350 a day.
- The app contains information about how the lockers are opened and closed, as well as instructional movies for the four products.
- The battery-driven products are serviced and washed daily by Husqvarna staff who ensure that the equipment is always in good condition and fully charged.
- The communication between Husqvarna Battery Box and the customer takes place via Bluetooth and via Bank ID, a secure electronic identification and signing method. The product usage charge is deducted at the end of the month from the credit card that the customer has registered.
- Battery Box can also be a future solution contributing to the UN Global Goal 'Responsible Consumption and Production'.

HUSQVARNA

With over 325 years of innovation behind them, Husqvarna delivers forest, park and garden products for professional users. We bring together high performance, user-friendliness and safety, so that you can get the job done, efficiently. Husqvarna offers a broad and growing range of products, including everything from chainsaws and cutting machines, to robotic lawnmowers.

Over 85,000 electric trucks were produced in 2017 at the facility in Mjölby.

TOYOTA MATERIAL HANDLING

"We have been circular long before the term was coined"

Since 2013, Toyota Material Handling has managed to increase the number of second-hand trucks sold by 40 percent in Europe by servicing, reusing and recycling. At the same time, the number of trucks for scrapping has decreased by 22 percent. The reason for success lies in business model – which has been circular long before the term was coined.


AGNETA RING

"The entire basic business model structure is circular – and has been so way before we even started discussing the concept of circular economy," says Agneta Ring, Sustainability Manager at Toyota Material Handling.

Used trucks come to the Fleet Management Centre in Mjölby after the customer's lease agreements expire. At the facility, staff go through the trucks to see how to breathe new life into them: Either the whole truck is reconditioned, or parts of it. It can then be leased again, to new customers. What is sold to the customer is not the product in itself – but its function. When the customer no longer needs the product, they can return it.

"What is unique about our product is that we connect service agreements to our business model, which means that we work closely with our customers during a longer period. That means we have the opportunity to discuss these issues on an ongoing basis with our customers," says Agneta Ring.

She sees the circular economy as a great opportunity – both for Toyota Material Handling and other businesses. By following their example, other companies can learn that there are great gains to be made by applying circular thinking, both for the business itself and for the environment.

"A market can be identified, like we have done with second hand trucks, where you can take a whole new segment. At the same time, what does not provide business benefits can be minimised, like in our case, the number of trucks for scrapping. In this way, the system can be trimmed at both ends."

To make the business circular demands everyone within the company to view the business operations and the established goals in the same way. In order to improve the lifespan of the products, a dialogue is needed between those who develop products and those who investigate and decide which parts can be reused on a truck. But it is also necessary that the area of sales and sustainability realise the power that lies in the concept and work together towards the same goal. Toyota Material Handling has also had great help from researchers from Linköping University, who have studied the company and provided new insights.

"To find the solutions that work, we all need to challenge ourselves and see the possibilities. When the customer product is expired, or the lease runs out, we must all ask ourselves the question: What can I do with the product in the next phase? How can I build a system where this product can be recovered and

reconditioned in full, or where parts of the product can be used to create a recycled product?"

The company has been working for a long time using an integrated lifecycle approach to maximise the lifespan of the products. Agneta Ring sees opportunities for adjusting operations to a circular economy, because the company has been applying those same principles for a long time. And she does not perceive any conflict between working circularly and good profitability.

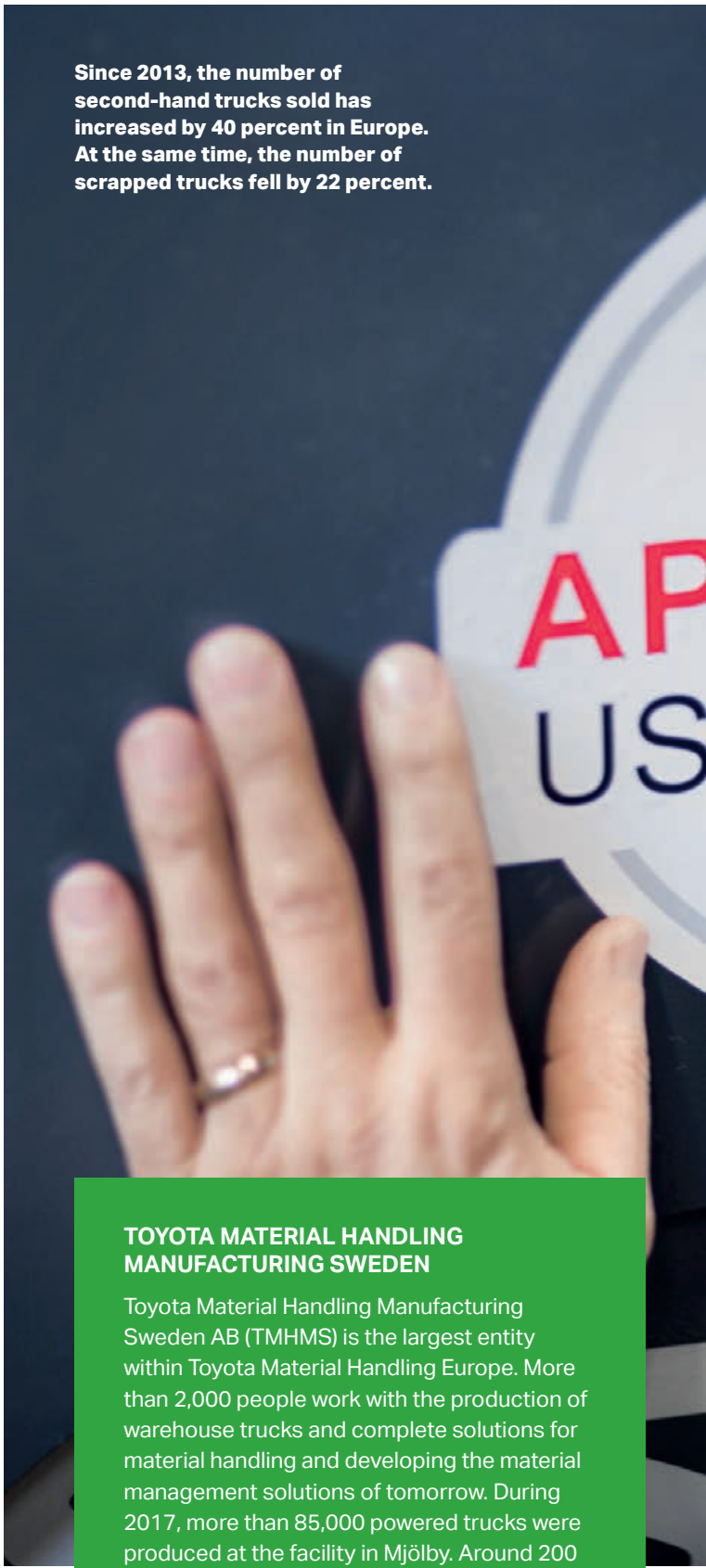
"I see no real obstacles to realising this on a larger scale. These questions go hand in hand. A sustainable business is based on taking an active part in caring for the environment – as well as having a financially sustainable business. That is why I cannot separate them."

She would like to see research on how circular economics can be defined and measured in order to transition the society as a whole to more circular economics. Models for assessing different types of circular systems – and how they relate to each other – is also needed.

"I think the biggest difficulties lie in how we are going to measure how good what is being done is from a circular economy perspective. What measurements, methods and models should be used? What is 'good circular work' and what is less good circular work? I see that as an area for further discussion and research."

On the part of Toyota Material Handling, Agneta Ring sees the circular economy primarily as a potential way to communicate more with customers – and the rest of the world – that this is a model that they believe in and already use.

"I think we have come a very long way. Our business model is already circular in practice – and was so before the term circular economy was coined. We are very happy because we already have this mindset implemented. Then the question is where the limit is for how far-reaching we can be. In that respect we must dare to challenge ourselves, together with our customers."



Since 2013, the number of second-hand trucks sold has increased by 40 percent in Europe. At the same time, the number of scrapped trucks fell by 22 percent.

TOYOTA MATERIAL HANDLING MANUFACTURING SWEDEN

Toyota Material Handling Manufacturing Sweden AB (TMHMS) is the largest entity within Toyota Material Handling Europe. More than 2,000 people work with the production of warehouse trucks and complete solutions for material handling and developing the material management solutions of tomorrow. During 2017, more than 85,000 powered trucks were produced at the facility in Mjölby. Around 200 engineers are working on development within Internet of things, telematics and automation.

THE CIRCULAR OFFER OF TOYOTA MATERIAL HANDLING

Remanufacturing is a major part of the daily operations at Toyota Material Handling, and it involves extending the lifespan of the product, over and over again.

The company focuses on further developing product designs that facilitate maintenance, recycling, reuse and remanufacturing.

Another circular business model that Toyota Material Handling uses is a product service system called Rental and Used. This model combines physical products with service which has been optimised in relation to the customer value using the integrated lifecycle approach. Toyota Material Handling services and maintains the product on site at the customer, which means that product life is increased, while avoiding emissions from transport and logistics flows.

Since 2013, the number of second-hand trucks sold has increased by 40 percent in Europe. At the same time, the number of scrapped trucks fell by 22 percent.

In collaboration with the Västra Götaland region, around 80 Focus chairs made by Skandiform in the 1980s have been renovated. With direction from Skandiform, the chairs have been lacquered and fitted with new padding and new fabric. The redressing was made by the same seamstress who upholstered the chairs when they were made! The project has become very successful and will probably continue on – as there are many Focus chairs out there.

(Skandiform is part of the Kinnarp Group)

KINNARPS

"We have won business by working circularly"

Kinnarps is one of Europe's largest office suppliers, with customers in about 40 countries. A couple of years ago, the furniture company from the Swedish region of Västra Götaland, decided to invest heavily in working more circularly. The Kinnarps Sustainability Manager, Johanna Ljunggren, sees the initiative as a necessity – and a big business opportunity.


JOHANNA LJUNGGREN

"We see a great potential in working circularly. More and more of our customers are interested and demanding more reused furniture materials. In the long run, it's about surviving as a business – but there is also market potential in meeting the demands of our customers," says Johanna Ljunggren.

The work began with a research project on circular furniture flows a couple of years ago, in collaboration with the research institute, Rise. It has now led to a series of concrete results, ranging from product design to new business models.

"It's a completely different business that is about helping our customers, often a at a lower cost. It is spurred on by customer demand for those kinds of solutions – to rebuild what they already have. And it has increased in recent years, with more and more people requesting it, even large public sectors actors."

Renovations can be about replacing table tops but keeping the frame or redressing out-of-date seat cushions and backrests. The ambition to recycle as much material as possible has led to all polyester fabric waste now being mixed with recycled PET bottles and turned into sound absorbers. But to work circularly is also to a large extent about quality and design – to manufacture products with such longevity that it pays to renovate them.

"It is basically about managing the resources available and using them wisely. Kinnarps started as a small company by a couple from the Västra Götaland countryside. Managing resources well, goes hand in hand saving money," says Johanna Ljunggren.

The challenges have been about changing our own organisation and convincing the customers of the benefits. The market needs to be ready for new ways of consuming. Because if the customers don't request circular solutions, Kinnarps cannot offer them. And to implement circular thinking into the organisation takes time and patience.

"It's a perspective that can take some time for people to become familiar with – and to learn how to think differently. It takes patience and a lot of information to give people time to realise what it means and see the potential."

A particular challenge for Kinnarps is that fashion and trends guide the interior industry so much – which requires changes to furniture to be based on other requirements than function alone.

"The linear business we have today is likely to live on to a certain extent. However, there is probably a great potential in the design of products, ensuring they can be adapted to trends and requirements. Today it is nevertheless a challenge for the industry to meet fashion and trends in a sustainable way. One way is to design the furniture from the beginning to be able to change over time, for example when it comes to colour," says Johanna Ljunggren.

As one of the leading office furniture suppliers in Europe, she thinks that Kinnarps has a responsibility to lead the development. Basically, it is about adapting the company business models to the present day.

"Today, a relatively small part of the economy – too little, I think – is circular. However, within ten years I think the furniture industry will have changed a lot. If it is as circular as it is linear, I don't know, but I think it will be a quick transition. We have invested a lot in circular economy – both in research projects, product development and our business development."

Has it paid off?
"I'm convinced that is has. We have been able to win business doing this – we have several examples to prove it. And that Kinnarps is focusing on circular economics going forward shows that the company believes that this will pay off," says Johanna Ljunggren.

KINNARPS CIRCULAR OFFER

- **Design and quality:** To manufacture products that are made to last for a long time, and it pays to refurbish and reuse.
- **Material:** Increase the use of waste and recycled materials.
- **New types of services:** Different types of leasing options, where customers can rent furniture. To be able to renovate or refresh products. To help customers move, change or sell products on, or – as a last resort – recycle them.

EUROPE'S LEADING SUPPLIER OF OFFICE FURNITURE

Kinnarps is the leading Swedish office supplier, specialised in office furniture and workplace furnishings for the contemporary and creative office. The company was founded in Kinnarp in 1942 by Jarl and Evy Andersson who saw the need for modern, functional and beautiful office furniture in the emerging service society. Today, we are one of Europe's largest office suppliers with customers in around 40 countries.

Kinnarps has a total of seven different production facilities for office furniture: six in Sweden and one in Germany. Production and assembly are done in Kinnarp, Jönköping, Skillingaryd, Vinslöv, Tranås and Worms. The largest facility for the development and manufacturing of office furniture is in Kinnarp, where we also have our group management team and key functions. We are about 2,300 employees who specialise in office furniture for the office of the future.

Instead of disposable packaging wrap, blankets are wrapped around the products. These are then taken home to be reused. This saves 270 kilos of packaging per transport and our customers do not have to manage waste.


S-BAG
Electrolux
PURE D9

ELECTROLUX

"Even in the circular economy, the goal must be to reduce environmental impact during the product life cycle"

Swedish white goods giant Electrolux has ambitious goals for how much recycled material should be found in the company's products. Electrolux has also been running several circular business models aimed at companies for a long time. But the biggest challenge from an environmental perspective, is to reduce resource consumption when the products leave the factory.


HENRIK SUNDSTRÖM

"The energy and water consumption when our products are used, account for 90 percent of the Electrolux footprint when applying a lifecycle perspective. The circular economy is about resource efficiency, but as long as our societies consume so much fossil fuels to generate electricity, the energy consumption of the product will be in focus," says Henrik Sundström, Sustainability Manager at Electrolux.

For more than ten years, the white goods manufacturer has been working tirelessly to reduce the amount of material required to manufacture its products. In 2008, the company launched a recycled vacuum cleaner in a campaign aimed at drawing attention to the plastic pollution of the world's oceans. Today, Electrolux vacuum cleaners consist of up to 70 percent recycled material. In total, Electrolux used 5 640 tonnes of recycled plastic in their production in 2017. The goal is to reach 20 000 tonnes of recycled plastic by 2020 – something that has proven difficult.

"The recycled plastic suppliers are usually small – almost the opposite of fossil plastic suppliers, which are large multinational companies ready to deliver exactly what you want. But the recyclers are often scrap dealers who come from waste management trying to deliver qualitative materials. Therefore, there are major gaps in the market that need to be addressed before really large volumes of recycled plastic can be brought to market, says Karl Edsjö, responsible for recycling issues and resource policy at Electrolux."

To make large companies use more recycled materials, they call for large-scale solutions that make it easier to access high-quality materials. Relying on local solutions is not possible for a company the size of Electrolux. Therefore, solutions that work at global level are also required.

"I think it's important not to view Sweden as an isolated market, because we're not. When looking for recycling solutions, we look at Europe as a whole. The starting point is that we have a global economy and a free market. And in that way, we need more large-scale solutions to solve the demand for materials," says Henrik Sundström.

In terms of metals – which account for a large part of the company's own carbon dioxide emissions – Electrolux has increased its share of steel with 100 percent recycled raw material from 7 percent in 2013, to 30 percent in 2017, reducing carbon dioxide emissions by 256,000 tonnes annually. In total, the investment in recycled steel has saved the equivalent of 1 084 000 tonnes of carbon dioxide emissions. In parallel, energy use in the factories has been reduced by 40 percent since 2007. However, as more and more people in emerging economies are increasing their quality of life, the pressure on companies such as Electrolux is also mounting to minimise the environmental and climate impacts stemming from usage of their products. In order to follow the Paris agreement goal of limiting global warming to 1.5 degrees, Electrolux has set a goal of decreasing their production-based CO2 emissions with 80 percent, 2015–2025. During the same period, the emissions that occur when the products are used shall decrease by 25 percent.

"The big challenge in society is about the growing middle class. We work hard in Europe to increase the energy efficiency of our products. But a lot of the impact is coming from the growing middle class in developing countries. It is something that we, as a global company, need to take into account."

KARL EDSJÖ

The other side to working with circular economics is, according to Henrik Sundström and Karl Edsjö, to find business models that are more circular.

On the corporate side, they are already commonplace. In Denmark, housing associations can have washing machines delivered by Electrolux, then choose to buy the entire product or pay per wash. In the United States, the company places washing machines for free at laundry facilities, in exchange for receiving part of the money that customers pay to use the machines.

"Over the years, we have been trying out circular business models in several ways. But time and circumstances have not always been on our side. Today, the interest in owning products is not as big. People want the function of a product. The digitalisation of society and the development of connected products have also changed conditions dramatically. These questions are interlinked, and I think the time is right now to move towards circular business models," says Henrik Sundström.

Neither Henrik Sundström nor Karl Edsjö believe that Electrolux is dependent on selling the products themselves – if they can get paid for the function they deliver. Instead, they believe that circular business models can present possibilities to connect customers more to the company, by not only offering the product itself. In order to increase demand for circular solutions, they call for large-scale demonstration projects, for example when constructing large housing areas, where people can see for themselves how it works.

"The circular economy is about reducing resource use and maintaining the value of the material during the product lifecycle. It's important that it's done with the aim of reducing overall environmental impact and not cause negative social impacts," says Henrik Sundström.

ELECTROLUX

Electrolux is a leading global manufacturer of white goods, selling amongst other things, washing machines, dishwashers, refrigerators, stoves and vacuum cleaners. The company also owns several other brands in the white goods industry, such as Zanussi, AEG, Frigidaire, Westinghouse and Anova.

The company was founded in 1919 and has its headquarters in Stockholm. Electrolux sells more than 60 million products to households and professional users in more than 150 markets each year. In 2017, Electrolux had an annual turnover of over SEK 120 billion, employing over 50,000 people worldwide.

MORE RECYCLED MATERIAL AND REDUCED EMISSIONS

- Electrolux has the ambition to replace virgin materials with recycled materials in their products.
- The company has set a target of replacing 20,000 tonnes of new plastic per year with recycled plastics, mainly polypropylene, by 2020. It corresponds to a quarter of all polypropylene plastic that the company uses. In 2017, Electrolux replaced 5,640 tonnes.
- Has increased the share of steel with 100 percent recycled raw material, from 7 percent in 2013 to 30 percent in 2017, reducing carbon dioxide emissions by 256,000 tonnes annually. In total, the investment in recycled steel has saved the equivalent of 1 084 000 tonnes of carbon dioxide emissions.
- Started using recycled plastic already in 1995. Currently selling products with up to 70 percent recycled plastic.
- Electrolux has set a goal of decreasing their production-based CO^2 emissions with 80 percent, 2015–2025. During the same period, the emissions that occur when the products are used shall decrease by 25 percent.
- Has reduced energy use in the factories by 40 percent between 2005 and 2017.

Grinding of the outer ring of the wheel tread in a medium-sized spherical roller bearing.

"Energy and material efficiency are part of our core business"

By recycling tapered roler bearing units for trains, the amount of energy, raw materials and waste can be reduced by over 60 percent, compared to manufacturing new units. It shows that economic and environmental gains exist in working more circularly, according to SKF.


MAGNUS ROSÉN

"Energy and material efficiency drive our business forward, as it is for many of our customers. To sell services and better performance rather than products alone is part of our business strategy, even though we haven't connected it to the circular economy. Remanufacturing, or bearing refurbishment as it's also called, has been part of our business for a long time. But these business models are becoming increasingly relevant in today's world," says Magnus Rosén, Senior Sustainability Advisor at the SKF Sustainability Department.

SKF has been working for a long time to reduce material consumption by recycling for example steel scrap, extending service life and improving performance in products and customer solutions, and bearing remanufacturing. Instead of connecting the work to the concept of circular economy, it is based on an integrated lifecycle approach, focusing on energy and material efficiency. And it has yielded clear results. Although SKF's business has doubled in terms of net sales during 2006–2017, their energy use and carbon dioxide emissions have decreased during the same period.

"In this respect we see a decoupling between economic growth, and energy use and emissions. However, we don't use the concept of circular economy that much at SKF. We would rather talk about the concrete activities, projects and contributions that they lead to, rather than overarching frameworks. We are talking about energy and material efficiency, increased service life, improved reliability and performance, both in our own business and that of our customers," says Magnus Rosén.

One of the activities in SKF's factories around the world is to remanufacture used bearings and units, above all the large and medium sized ones that are mounted for example in wind turbines, mining equipment as well as pulp and paper applications. It can be anything from cleaning or replacing individual components, right through to more extensive renovations. Thereby, the same material can be reused during several lifecycles – and the process becomes significantly shorter compared to new production, which means big wins, both for the environment and for the customers.

"As population growth and industrialisation increases, so does demand for materials. As a company, we are dependent on lots of raw materials. If we can reduce our raw material purchases and instead reuse bearings with the same function as new ones, then we are looking at significant financial gains as well as environmental benefits. We see great improvements in these areas, at the same time as being cost effective for both us and for the customer," says Jonas André, Manager, Stakeholder Communications at the SKF's Sustainability Department.

Lifecycle studies of storage units for the railway industry show, for example, that over 60 percent of energy, raw materials and waste can be avoided during remanufacturing compared to new production. That means great potential, and SKF is committed to unlocking this in the future, both internally and externally.

JONAS ANDRÉ

"We see great potential in selling a function rather than selling a product. That kind of solutions are found in many of the industries as we serve, both major industrial bearings in for example wind turbines, the pulp and paper, as well as mining industries, but also smaller bearing units in rail vehicles. In combination with sensors, which increases precision and signalling when the bearings should be refurbished or remanufactured, there are significant opportunities to increase this kind of business," says Jonas André.

New business models also mean new issues, for example regarding who owns a remanufactured product or how the payment model should look. It also requires some maturity from the customers – that they are ready to pay for a service or machine uptime rather than a physical product.

"We think the best way to sell circular solutions is to make life easier for customers, so it will not be more complicated to buy remanufactured bearings. You don't have the time or inclination to make it more difficult, after all, it's about a change of a behaviour. However, if you can insert circular thinking in something that makes life easier for our customers and demonstrate the environmental value together with cost savings and an increase in efficiency, you get a concept that is very appealing," says Jonas André.

Although SKF is at the forefront when it comes to energy and material efficiency, Magnus Rosén believes that the company – like the rest of the industry – is just starting the change process. Choosing not to follow the development as a company he sees as very risky, purely from a commercial perspective.

"To remain relevant as a company, one must see how these big issues will affect customer demands and long-term business models. It's important to be able to adapt. It's like any other strategic issue. Should big industries change their business models and their industrial systems towards a greater degree of remanufacturing rather than new manufacturing, then the entire chain needs to be adapted to this new logic. And energy and resource efficiency are always relevant – regardless of whether it is linear or circular," says Magnus Rosén.

CAN SAVE OVER 60 PERCENT

SKF offers industrial remanufacturing of all main well-known bearing brands used within industries such as metal, mining, mineral processing, renewable and traditional energy, pulp and paper, cement and marine. In addition, SKF remanufactures bearings for the aviation industry and has a global network of remanufacturing workshops for spindles for machine tools.

SKF focuses on the remanufacture of bearings and units, which means great benefits both from an economic and environmental perspective, especially for medium-sized to large bearings. Remanufacturing can include everything from simple reconditioning to significant processing and upgrading.

Lifecycle studies of tapered roller bearing units for trains for railway show that over 60 percent of energy, raw material and waste can be avoided when remanufacturing, compared to new manufacturing. Major economic savings can be also be achieved, depending on the size, complexity, wear and tear of the warehouse and price value.

Mounting of a remanufactured bearing.

SKF

- SKF was founded in 1907 and is one of the world's leading suppliers of bearing and units, seals, mechatronics, service and lubrication systems.
- SKF customers want reduced friction, and machines that run faster, longer, cleaner and more safely. By fulfilling this demand in the most efficient and sustainable way, the company contributes to the vision of a world of reliable rotation.
- SKF's primary strength is our ability to constantly develop new technologies and use them to create products that provide competitive advantages for our customers. This is done by combining practical experience in more than 40 industries, with our knowledge from SKF's different technology platforms.
- SKF has over 40,000 employees and is present in more than 130 countries worldwide.

ABB

"Digitalisation and sustainability go hand in hand"

For ABB, different digitalisation services are a natural part of the offer to customers. The services simplifies the customer's work and lowers their costs. At the same time, digitalisation is a great opportunity to increase sustainability.

LENA WESTERHOLM

"It is inspiring and fun to see the nice link between our digitalisation portfolio, ABB Ability, and sustainability, they really go hand in hand. We have only just seen the beginning of this," says ABB's Sustainability Manager, Lena Westerholm.

An important part in ABB's pursuit of a circular economy is to extend the lifespan of the products we sell. One tool in that work are different digitalisation solutions, solutions ABB call ABB Ability. One example is remote monitoring to reduce the need for maintenance.

"For example, we sell steering systems for cranes, that allows a Swedish control room to monitor how a crane in China is functioning. Or we can put a sensor on an electric motor that senses when there is something wrong. That way, we can dispatch maintenance in time, which reduces the risk of operating interference. We make maintenance proactive, which decreases consequential costs," says Lena Westerholm.

Another way to extend the life of products is to design them to make it easier to replace individual parts. For example, if a motor breaks down, you do not have to change the whole thing, but just upgrade the broken parts.

"Just like a mobile phone – why should you replace the entire phone if it is enough to change only one part? Therefore, we also work with design for modularity."

Circular economics may require new business models. During the spring, ABB has let six students from Linköping University do their degree work within the company's robot business, specifically studying the ABB business model. Lena Westerholm emphasises how inspiring the collaboration with the students and universities have been, not least because the company has gained more insight into what needs to be developed.

"Amongst other things, the students have looked at what it means for the customer and for us if we, instead of selling a robot, lease it, and continue to own it ourselves. The conclusion from the theses is that when we transition from a transactional business model, where we sell a robot instead of selling a robot service, it affects the whole business. It became clear that a new business model affects everything from design to the financial approach," says Lena Westerholm.

She points out that ABB worked a long time with recycling and reusing, as well as avoiding virgin materials.

"To take a holistic approach and look more at the business models, that's a bit of a new dimension when it's so clearly linked to sustainability."

Lena Westerholm thinks that ABB can have a head start compared to many other companies when it comes to circular thinking. The reason is that the circular is much about what ABB has always done: Help customers with energy efficiency.

"So to think about resource efficiency is naturally built into our business model, which distinguishes us from a company that sells clothes for instance."

Lena Westerholm believes that ABB, in cooperation with their customers, must explore how they can work more circularly. The biggest obstacle is that it is easy to get stuck in old thinking patterns, after living for a long time in a linear society.

"Therefore, we need to change and think circularly. And it's not enough that only part of the business is doing it, we all need to learn to think circularly. But I think we can be inspired by our personal lives. This for instance about how leasing a car instead of owning has boomed. I think our desire to own will look different in the future."

Lena Westerholm sees great opportunities for ABB to get really good at working circularly. Partly because the company has a long history of working systematically with energy efficiency, and partly because various digital solutions will speed up the work.

"So I think ABB can be really, really good at this. Then there are some things left to do, for instance doing more innovative thinking about business models. It is easy to keep doing what you've always done, but both us and our customers have to think in new ways. But this journey has started now. To work circularly is good, both for our customers' finances, for our competitiveness and for the environment."

FROM CRADLE TO GRAVE

ABB has the ambition to track the customer who buys their products throughout the lifecycle of the product, from cradle to grave. ABB also takes back products, such as robots, to restore and sell on as an upgraded product. In this way, the used products are recycled to extend lifespan and increase their usefulness as well as their as use. ABB also builds standard solution robots that can easily be reused in order to make new products through minor customisation, without parts of the installation needing to be scrapped or rebuilt. ABB is also looking into new business models, where customers can lease a product for a desired period.

ABB

(ABBN: SIX Swiss Ex) is a pioneering technology leader in power grids, electrification products, industrial automation and robotics and motion, serving customers in utilities, industry and transport & infrastructure globally. Continuing a history of innovation spanning more than 130 years, ABB today is writing the future of industrial digitalization with two clear value propositions: bringing electricity from any power plant to any plug and automating industries from natural resources to finished products. As title partner in ABB Formula E, the fully electric international FIA motorsport class, ABB is pushing the boundaries of e-mobility to contribute to a sustainable future. ABB operates in more than 100 countries with about 147,000 employees. www.abb.com

The seats, as well as the carpets on the floor, in the specially-built version car are made from recycled PET bottles. The consoles are made from recycled fibres, ropes and old fishing nets. And the soundproofing material is from old car seats.

VOLVO CARS

"With the electrification of cars, materials gain in importance"

Volvo Cars is working hard to electrify their cars. And as the exhaust gases account for an increasingly smaller part of the company's footprint, materials are becoming an increasingly important part of the sustainability agenda. Volvo Cars has therefore, among other things, set a target that at least 25 percent of the plastic in all new Volvo cars will be made from recycled material by 2025.


ANDREAS ANDERSSON

"The use phase has always been the dominant part of our environmental footprint. But now we are facing a shift, where we are switching to electric cars. When we reduce the environmental impact through electrification, materials will become increasingly important for the overall footprint for us," says Andreas Andersson, Attribute Leader Environment at Volvo Cars.

In conjunction with the 2017–2018 edition of the Volvo Ocean Race sailing competition, large meetings – Ocean Summits – were organised to highlight the issue of plastic pollution harming the world's oceans. Governments, companies and researchers together tried to find solutions to reduce the supply of plastic. In connection with one of the meetings, Volvo Cars went public with the news that at least a quarter of the plastic in all new Volvo cars will be from recycled material from 2025.

"By setting this goal, we want to show that there is a large-scale demand for recycled plastics – both for our suppliers and for the recycling industry. We want to kick-start the circular thinking, in order for there to be a bigger market for recycled materials," says Niklas Kilberg, Corporate Sustainability at Volvo Cars.

At the same time as Volvo Cars announced their vision of recycled plastics, the company also unveiled a specially-built car. Unusually, it looked almost exactly like a regular Volvo XC60T8 Plug-in hybrid SUV. The only difference was that a large part of the components were made from recycled plastic. The consoles were made of recycled fibres, ropes and old fishing nets. The carpets on the floor were made of fibres from old PET bottles, as well as the upholstery of the seats. And soundproofing material came from old car seats.

"The point was to show that there is no visual or quality difference between recycled plastic and ordinary plastic. But we also wanted to show internally for those who design, that there is no big difference, and that it's possible to do it. In addition, we wanted our suppliers to learn how to work with these materials," says Andreas Andersson, who, along with Kristina Gross, worked as a project manager for the work on the specially-built car.

Each Volvo car contains around 300 kilos of plastic – and today, the proportion of recycled plastic is around 5 percent. Increasing that share to 25 percent would generate major environmental benefits. And the specially-built demonstration car received great attention, not only in the automotive industry, but was also praised by the Head of the United Nations Environment Program.

"Extensive recycling and reuse of plastic is vital to our efforts to turn the tide on plastic pollution. Volvo's move to integrate plastic waste into the design of their next fleet of cars sets a new benchmark that we hope others in the car industry will follow. This is proof that this problem can be solved by design and innovation," says Erik Solheim, Head of the United Nations Environment Program, when the car was presented.

At Volvo Cars, working with recycled plastics is one part of the company's overall sustainability program. In the beginning of 2018 for example, the factory in Skövde became the first climate-neutral production facility. And by 2025, Volvo Cars is aiming for all factories to be climate neutral. Last year, they announced that all car models launched from 2019 onwards would be electrified. From 2025, fully electric cars will account for 50 percent of sales. Something that will affect the entire company's footprint – and where the focus of the sustainability work should be.


NIKLAS KILBERG

"Within the automotive industry, we have very long development cycles, which means that the transition takes time. However, we have an opportunity now as we are transitioning to electric cars. In the past, our main focus has of course been on exhaust emissions. But the more they disappear, the more our focus shifts to other areas, especially materials," says Niklas Kilberg.

Another part of Volvo Cars' work on making materials and resources circular, is the reuse and remanufacturing of used spare parts. Ever since 1945, Volvo has offered customers remanufactured spare parts, which are sold with the same guarantees as new spare parts.

"At that time, it was not about the environment, but about resources. When a customer comes to us for a service and we find something that is broken, we take care of the old starter or gearbox. Then we renovate it and make it available as a used but restored spare part. This accounts for about 15 percent of our spare parts sales and is done globally, through our return system," says Niklas Kilberg.

The work on recycled plastics has made great strides – not only in the cars, but also within the company. Among those who develop products, many have wanted to contribute. There has been a sense of pride that Volvo Cars is able to make ground-breaking decisions that can pave the way forward. Following the presentation of the 25 percent recycled plastic vision, the logistics department also announced that they aim for 25 percent recycled plastic in packaging solutions by 2025.

"We have learned a lot about engagement and how important it is for employees to be proud of the company they work for. This applies to both of the 25 percent visions – but also that we are removing all single-use plastic in the company globally by the end of 2019. All of this builds huge engagement, both internally and externally and we get more people coming to us with questions about our work," says Niklas Kilberg.

FOCUS ON ELECTRICITY, SECURITY AND RECYCLING

- Volvo Cars' goal is to be the leading player in security technology, electrification and autonomous driving. Around 2025, half of their cars sold will be fully electric, one third autonomous and half belong to the company's subscription service Care by Volvo. But already next year, all new models launched will be electrified.
- From 2025, at least 25 percent of the plastic used in all new Volvo cars will from recycled material. In 2018, Volvo Cars launched a demonstration version of the XC60T8 Plug-in hybrid SUV model, with a large number of components made from recycled plastic.
- At the beginning of 2018, the factory in Skövde became the first climate-neutral production facility. By 2025, Volvo Cars is aiming for all factories to be climate neutral.

Volvo Cars has set a vision that at least 25 percent of the plastic in all new cars will be from recycled material by 2025. To show that it was possible, Volvo Cars has unveiled a specially-built version of its XC60 T8 plug-in hybrid SUV that looks identical to the existing model but has had several of its plastic components replaced with equivalents containing recycled materials.

VOLVO CARS

In 1927, the first series of manufactured Volvo cars rolled out of the Gothenburg factory. Today, Volvo Cars is one of the most well-known and respected car brands in the world with sales in over 100 countries.

The company has an annual turnover of SEK 210 billion and has 38,000 employees around the world. In 2017, Volvo Cars sold over 570,000 cars.

The Volvo Car Group (Volvo Cars) is owned by Zhejiang Geely Holding (Geely Holding) in China since 2018, with its headquarters in Gothenburg, where much of the development and production takes place.

Volvo Cars also has manufacturing in Belgium, the United States and China, as well as assembly plants in Malaysia and India, development centres in Sweden, Denmark and the United States, as well as design centres in Sweden, the United States and China.


Fruänoen

BOMBARDIER

"Our products are designed to pass the environmental requirements that travellers will demand in 30 years' time"

The railway company Bombardier is working holistically and evaluates the overall effect of all decisions in the manufacturing process. The company knows, component by component, exactly which materials all their trains are made of. The challenge is that the product they are delivering doesn't just have to meet today's environmental requirements, but also the ones 30 years from now.

"We are working to create an attractive product for travellers, so that more people will want to choose public transport. The lifespan of our products is long, we want them to be future-proof and withstand the environmental requirements set by the market when expectations have been turned up," says Marina Sundman, Sales Manager at Bombardier.

For a train manufacturer like Bombardier, the goal is to minimise energy consumption during production, while in operation and at decommissioning. Based on a term like circular economy, focusing on material choices and reduced use of raw materials, it is important for Bombardier to highlight that the company's goal is to make sure the total lifecycle energy consumption is as low as possible, taking into account both material choices as well as energy consumption and maintenance. Bombardier sees this as a competitive advantage and one of their primary selling points.

"Together with our customers, we are motivated to develop and produce vehicles that can withstand scrutiny. The design is functional and takes into consideration material choice, energy performance and easy maintenance. When energy consumption is low, and the need for maintenance is small, the lifecycle cost is also lower. A material that is very energy-efficient but still need to be replaced periodically is in the long run neither cost-effective or good for the environment," says Marina Sundman.

MARINA SUNDMAN

Additionally, travellers – the end consumers – must feel confident that the trains run reliably and reassured that they have made a smart choice taking the train.

"For example, we are currently working to find a replacement product for a gas that we use for air-conditioning. The gas will be phased out, and if we can't find a satisfactory replacement product we risk travellers choosing to stop going by train and taking the car instead."

That the train consumes as little energy as possible is self-evident. Bombardier tries to minimise it as much as possible through the best possible aerodynamics, but above all by keeping the weight of the train down. In that regard it is important how

the train is run. Of course, energy is used when you accelerate, but Bombardier is now developing systems that can harness the energy produced from deceleration.

"We are now implementing this technology in the vehicles we are building today. We also look at how we can reduce energy consumption in our older vehicles. For example, today's current converters consist of silicon semiconductors, but by using silicon carbide, that can handle significantly higher voltage, switching frequency and temperature, energy losses are reduced. With a new material, energy losses in some parts of the vehicle are reduced by 34 percent. It corresponds to up to around 15 percent lower total energy consumption in the train. That adds up to a lot down the line," says Marina Sundman.

All component materials that Bombardier use in their products are documented in a database, down to the smallest screw. This information, traceability, is valuable in future maintenance and management of vehicles manufactured by Bombardier.

"We know component by component, what material we build into each respective vehicle."

Therefore, Bombardier knows which materials are used, where they come from and if any material is due to become prohibited in the future, so that Bombardier will need to phase out the product.

"If there's a match in such a phase-out list, it triggers activity in our organisation where we see what replacement materials we can find, or come up with alternative solutions. We try to be ahead of the game so that we can predict future needs."

For some materials, an alternative is not always available. If so, Bombardier collaborates with their subcontractors to find solutions. Another piece of the puzzle for Bombardier is to work with digitalised production lines. Using virtual reality to develop and test the production concept at an early drawing stage. It makes production more efficient, which in turn means using less resources.

Marina Sundman believes Bombardier is only at the beginning of the journey to work circularly.

Her vision is to be able to provide an application so that every traveller, after their trip, will be able to see the carbon footprint for that route – an individual and specific energy performance rating for each vehicle based on material choice and total energy consumption.

"Our main driving force is to create a product that is sustainable long-term. Our customers should feel, that when they buy a product from us, their travellers will want to use it for decades, that the product they buy is future-proof."

BOMBARDIER

Bombardier is a world leading manufacturer of innovative transport solutions, from commercial airplanes and business planes, to railway equipment, systems and services. In 2017 the group's turnover was USD 16.2 billion and the company currently has about 70,000 employees. The headquarters is located in Montreal, Canada, whereas production takes place in 28 countries. Bombardier is listed on the Toronto Stock Exchange.

The subsidiary, Bombardier Transportation, is a leading global railway technology company, with a broad product portfolio and innovative products for environmentally-friendly transport. In addition to producing entire trains, the company also makes signal systems and offers maintenance services. The headquarters is located in Berlin and the number of employees is approximately 40,000, with operations in over 60 countries.

Bombardier Transportation Sweden AB employs 1,700 people in Stockholm, Västerås, Gothenburg, Hässleholm, Luleå, Falköping, Nässjö and Gävle.

Bombardier knows, component by component, which materials they build into each vehicle.

WANT TO CREATE BETTER WAYS FOR PEOPLE TO TRAVEL

Bombardier wants to create better ways for people to travel. Sustainable and profitable growth go hand in hand with putting environmental efficiency and innovation at the heart of the company business model.

Bombardier supports the 17 UN Global Goals for Sustainable Development, and is working actively with three of them in particular:

- 11: Sustainable cities and communities
- 13: Climate action
- 17: Implementation and global partnerships.

Circular economy means resource-efficient and sustainable solutions

Circular economy has quickly become a term used in many different contexts. Several countries – among them some of Sweden's most important export markets – have developed strategies for increased resource efficiency and circular economy. But what does the term really mean, and what challenges and opportunities are there for business to think more circularly?

If all the inhabitants of the earth would live like us Swedes, we would need more than four earths. To transition to a long-term sustainable society, it will therefore be necessary to significantly reduce consumption of our natural resources. In the debate about how to rethink today's economic system to something that can fit within the planetary boundaries, the concept of circular economy has become increasingly popular – in comparison with today's linear economy.

"It makes sense to embrace a lot of what the circular economy stands for. The alternative – to remain in the system we have today – is not sustainable in the long-term. In that context, circular economy is the alternative that in the short term seems to be able to provide the best results and achieve a rapid increase in resource efficiency," says Mats Williander, Research Director at the research foundation Rise.

But there is no uniform description of what a circular economy means in practice. According to one study there are as many as 114 existing definitions (Conceptualizing the circular economy: An analysis of 114 definitions, Julian Kirchherr, Denise Reike, Marko Hekkert, 2017). Which, according to Mats Williander, is one of the reasons that the term has become so popular: That everyone can interpret it as they see fit, according to their own purposes. Despite this, he remains positive towards circular economics – and sees big risks for companies who choose not to work on the issue.

"The risks involved for companies that do not act are obvious. They will face competition from companies that are much more resource efficient, which in the end will mean losing out. In addition, there are critical materials where shortages may become apparent and therefore we want to recycle," says Mats Williander.

Ellen MacArthur Foundation, which is one of the prominent actors in circular economics, defines it as a way of decoupling economic growth from increased consumption of non-renewable resources. To minimise our use of natural resources – and hence our burden on the ecosystem – we must retrieve resources for the production of goods and services in other places than we do today. A vital part of the circular economy is therefore to make sure that the resources already in circulation in society are reused as effectively as possible. It is partly about how raw materials, residues and waste must be part of closed loops. But it is also about behavioural changes, where the emergence of a sharing economy with reduced personal ownership is a part.

"The circular economy is mainly about three things: Firstly, recycling materials. Secondly, to harness the value of existing products – that is, trying to reuse components instead of recycling and melting the material. Thirdly, it is about reducing the flows in these reuse loops by making more durable products so that you get as little material turnover as possible, because there is always a leak in return loops. If you do this, you will get the highest possible resource utilisation from raw materials," says Mats Williander.

For business and industry, it means extending the economic relationship to the customer, by offering more services than products. This may include maintenance, repairs and software updates, new types of service offerings, and to take back used products. The point is that the services and business models must be designed to benefit the planet, people and companies – at the same time.

There are also great opportunities for the business community to think more circularly. According to Mats Williander there are three key arguments for companies to take the matter seriously:

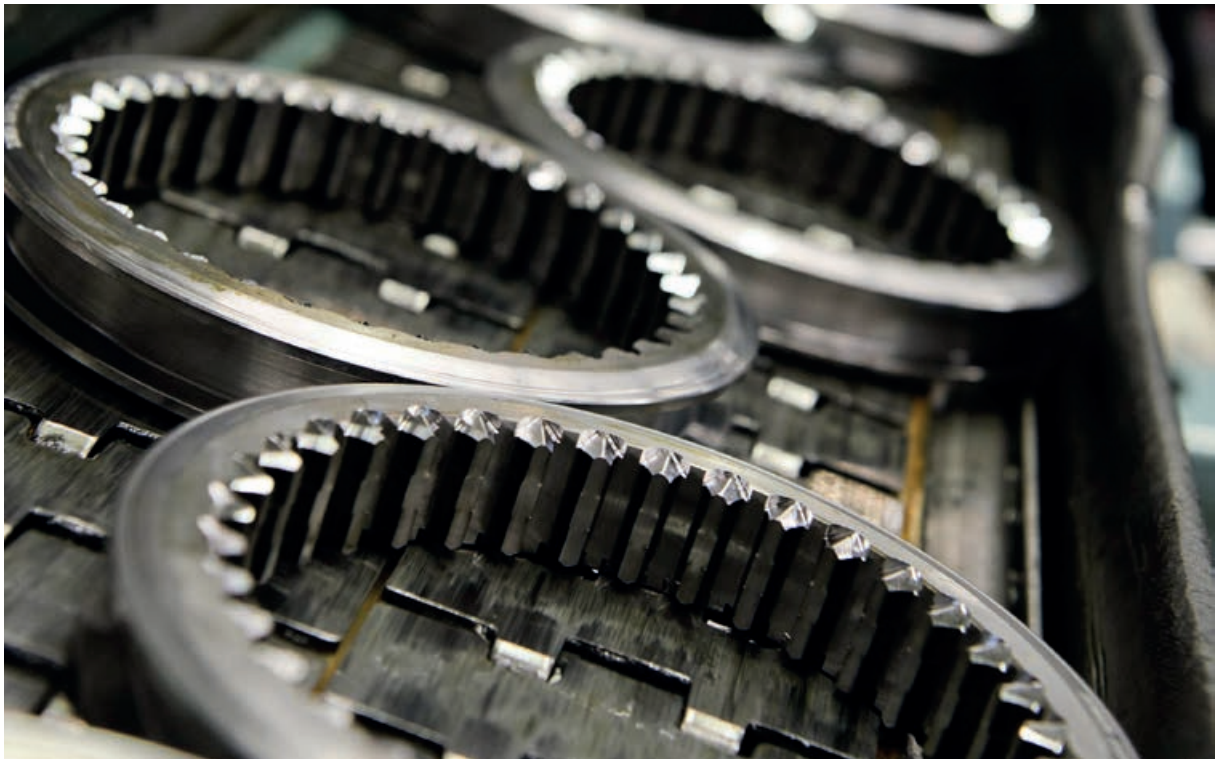
1. **Economic:** A more circular business model reduces the company's dependence on raw materials and makes them less sensitive to price fluctuations on scarce resources. In addition, companies can enter new markets by introducing reused, refurbished or renovated products.

2. **Environmental impact:** The total environmental impact of humanity today is unsustainable. By using more resource-efficient systems, such as circular economics, humanity can move towards a future where we operate within the planetary boundaries. By the industrialised part of the world decreasing our ecological footprint, we can provide space for the 2.5 billion people who strive towards reaching our economic standard.

3. **New business models:** A more circular business model often means that customers are more closely connected to the seller, for example through offers containing both the product and the service. This can give Swedish companies competitive advantages in countries with low production and manufacturing costs.

During 2017, Sweden exported technology to a value of over SEK 600 billion, which corresponds to 47 percent of our total goods exports. Several of the nations at the top of that list are also part of a group of countries that have developed plans or strategies for increased resource efficiency and circular economy, including Britain, Germany, The Netherlands and Finland.

However, if there are 114 definitions of what circular economics is, we are likely to see an even greater number of different business models transforming the principles into practice.



ACTIONS THAT DRIVE THE CIRCULAR TRANSITION

Strengthen Swedish industry. That industry generates prosperity and new solutions is a prerequisite for Sweden to be able to transition to a sustainable society. Teknikföretagen calls for public actors to invest in circular, climate-friendly and resource-efficient solutions.

1. We call for a multi-partisan strategy for public investments. The strategy should be climate-friendly, resource-efficient, sustainable, life cycle-focused and driven by innovation. Invest in strategic procurement for the public sector, focusing on innovative business solutions.

2. Promote collaboration between start-up companies and established industry, to develop circular and innovative business offers. Incubators in collaboration with higher education institutes and universities can, together with the strategic innovation programmes, stimulate the established industry to work with offers that challenge current linear business models.

3. The next government need to focus more intensely on improving and simplifying regulations, ensuring a focus on what should be achieved instead of how. New circular and resource-efficient solutions should not be hindered by complicated rules. The new and innovative Swedish industry demand an investment-friendly environment. National policy instruments in a globalised economy hinders competitiveness and the prerequisites for international trade.

Strengthen the EU. The internal market is good for trade, the environment and all people living in Europe. To accelerate EU-level work, we call for the following actions to be pursued:

4. Set high environmental requirements relating to the production of raw materials in international collaborations. The circular economy is not a local affair – it is a global issue. Sweden must therefore promote free trade with the EU as the focal point.

5. Set up an enquiry to review which European laws, rules and policies should be revised to stimulate more circular and sustainable solutions, putting free trade at the heart. The entire European internal market should be the base in order to develop the market for recycled materials, making sure access to recycled material of the right quality will increase. The EU internal market must eventually encompass all resources – even waste. Recyclable products and materials are classed as waste, which slows down the circular economy. The waste regulations of the future must contribute to circular solutions.

6. Develop sustainability reporting and international standards to drive development towards the use of recycled material. Product regulation is a very long-winded way to get to a circular economy, since regulative demands relating to resource-efficiency must be measurable.

Teknikföretagen's three focus areas are trade, competence and sustainability

"Circular Economy – Business with new values" is a deep-dive into circular economics and a complement to Teknikföretagen's paper "A competitive industry policy for Sweden". The paper gives examples of how companies work with circular economy and resource efficiency, as well as presents Teknikföretagen's list of proposals.

In Teknikföretagen's paper "A competitive industry policy for Sweden", we take a holistic view on the actions that companies, government and parliament need to take in order to make sure Swedish companies are competitive on a global market. It is about proposals to make companies start, grow and invest in Sweden.

Sweden should concentrate on enabling investments in modern solutions where investment needs are high. This is crucial to solve societal challenges both at home and to contribute to global development.

Digitalisation and automatisation, for instance in energy supply, transport and material use, offer opportunities to solve the challenges.

Sweden needs to invest in research, testing and demonstration, as well as public investment in infrastructure in a way that stimulates innovative solutions for reducing greenhouse gas emissions and increasing resource efficiency. It helps drive the sustainability agenda forward in Sweden and brings global environmental benefits through the export of goods and services.

The areas of smart cities, environmental monitoring, energy engineering, sustainable transport and logistics solutions, as well as the use of recycled materials, have a great deal of potential to ensure an industrial development that goes hand in hand with political environmental ambitions.

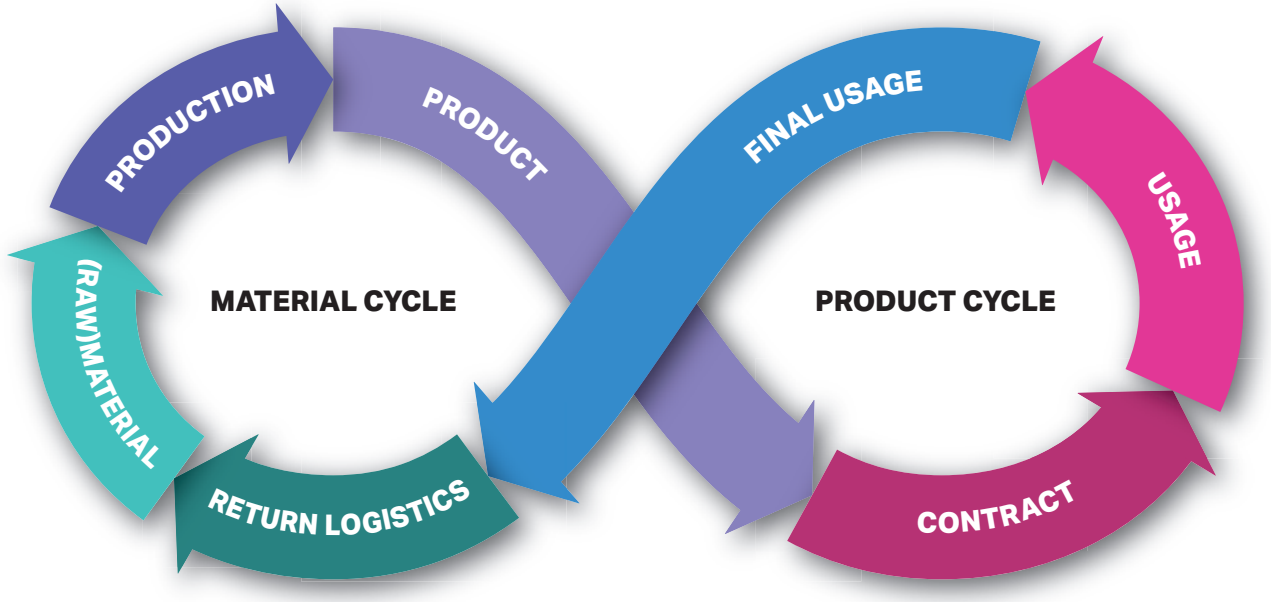
Swedish technology companies can, under the right conditions, contribute through both technology development and new business models.

Resource efficiency and circular economy have become political buzzwords that can be of great importance, but in practice must be researched, tested and given effective regulations to have long-lasting effect in society.

Swedish environmental and industry policy must work jointly to promote sustainable production and material use. Such a resource efficiency policy demands putting targets ahead of detailed micro management.

www.teknikföretagen.se

The eternity symbol is a challenge for the circular economy. The vision of a world without waste where materials circulate may be utopian but is worth striving for. However, the environmental benefit must be at the centre in all steps. Teknikföretagens' members work in all parts of the circular economy.



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Circular economy

BUSINESS WITH NEW VALUES

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Teknikföretagen

In a globalised world, creativity is Sweden's strength

TEKNIKFÖRETAGEN is the employer organisation for the creative companies accounting for a third of Swedish exports. Across the country, we support the technology companies in terms of labour laws and industry issues, so that they can focus on developing world-class goods and services.

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