

COVERSTORY





Chemist, philosopher and economist Antoine Laurent de Lavoisier (1743-1794) famously coined the phrase "Nothing is lost, nothing is created: everything is transformed" which seems to have predicted a definition of the circular economy. Here, an old bathtub transformed into a small sofa, in the Solarwind smart building (EcoParc Windhof).

Photo: Emmanuel Claude / Focalize

CIRCULAR ECONOMY

VIRTUOUS CIRCLE

The circular economy seems fashionable but ... it's not a fad. According to its most ardent supporters it is a real necessity, the only possible answer to the scarcity of resources, whether raw materials, energy or water. Luxembourg's government has made it a pillar of its economic diversification plan, in line with forecaster Jeremy Rifkin's recommendations, with the firm intention of positioning the country among the pioneers of this new way of economic thinking, at a time when calls for "qualitative growth" are multiplying.

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Translation from french : Martin Davies

The circular economy is defined intuitively as the opposite of the linear economy. In the latter, which still largely prevails, goods are produced, sold, consumed and then considered as waste and thrown away. The producer escapes responsibility for the end of the product's life cycle. This way of working is the origin of many inconveniences which the circular economy intends to remedy.

Luxembourg's motivation to make this transition is reflected in its Eco-innovation

index, published by the Observatory for Competitiveness. In 2016, Luxembourg came in second place in this ranking, just behind Germany, although it had been only in sixth place the previous year. However, if we look at the figures more closely, we see that this breakthrough is mainly due to applications for patents, academic contributions and good media coverage of the subject. Now these may be necessary conditions for developing a new economic model, but they are not enough. Indeed, seen from the perspective of socio-economic benefits, we are not there yet. Compared to other countries Luxembourg's circular economy is still modest in terms of jobs, turnover and exports. Fortunately, civil society seems increasingly ready for a paradigm shift. Popular exasperation increasingly points to planned obsolescence and can (sometimes) persuade even the older generation to reject practices that were once commonplace and didn't shock anyone. At the institutional level, it seems there is also a consensus in place. Since 2015, the European Union has made the transition to a circular economy one of its priorities and, in January 2017, the European Parliament adopted a "circular economy ►



When recycling creates jobs

By 2020, Creos will replace 250,000 electric meters and 45,000 gas meters with new generation smart meters. The company decided to make this project a circular economy project and to find a use for the old meters and their components. An accurate census has been developed to determine which meters are reusable and which others must be dismantled for recovery of materials (iron, copper, durable plastic, resin, glass ...). The collection of old meters is organized in parallel with the installation of the new ones, optimizing the routes. The project has created 8 jobs for a period of 3 years, in partnership with the Forum pour l'emploi asbl (fight against unemployment), funded entirely by the resale of reusable meters and recovered materials.



Photo: Écotrel

01.

package” which reinforces its ambition with quantitative incentive targets. The circular economy is also among the UN’s 17 Sustainable Development Goals to transform the world. This is Goal No 12: establish sustainable consumption and production patterns.

ADVERSE EFFECTS

Jean Lamesch, Vice President of the Superior Council for Sustainable Development, compares humans on planet Earth to Robinson Crusoe, isolated on his island, forced to survive using the limited resources offered by his environment. Humans, having only one planet at their disposal, not the three which would be required if current lifestyles applied to an estimated world population of 9.6 billion in 2050 (UN), must “make do” and therefore use resources with an awareness of their limited quantity, for the present generation but also for all those to come. “*Today’s goods must therefore be considered as the resources of tomorrow,*” according to Walter R. Stahel, founder of the Product-Life Institute, recognized worldwide as one of the founding fathers of the Circular Economy.

Today’s production and consumption patterns pose a threat of scarcity of resources and creating geopolitical risks, as resources are not equitably distributed over the globe. Europe, being a net importer of energy and raw materials, relies on the stability of its trading partners and the price of raw materials. But commercial partnerships are not set in stone and events of all

kinds (natural disasters, political crises, as well as the rapidly developing demand from emerging economies ...) could disrupt the established order and the availability of resources. According to the US *Geological Survey*, supplies of palladium, zinc, tin, gold, silver, copper, uranium and platinum have already been strained for years. The website www.encyclo-ecolo.com, which presents itself as the encyclopaedia of sustainable development, predicts the disappearance of these materials during the period 2025–2050.

In addition, the linear economy creates quantities of waste that are more and more burdensome to treat. It is to remedy this situation that the circular economy aims to use the fewest possible resources in the production process, or to make use of them more rationally. Giving new life to an existing product or using all or some of its components, is the same principle. Pushed to its limits, the circular economy aims to eliminate the concept of waste altogether and to dissociate growth from the consumption of resources. In principle, better use of resources should result in lower production costs. It is therefore a system that converges the interests of the economic world with ecological aspirations.

CAN LUXEMBOURG TURN AROUND?

In 2014, the Luxembourg government began to take a close interest in the circular economy. However, long before that, pioneering initiatives had been launched



Photo: CelluloPack

02.

which are now totally within the logic of circularity. In 1985, the *SuperDrecksKëscht*® (*SDK*) saw the light of day. Co-created by the Ministry of Sustainable Development, the Chamber of Commerce and the Chamber of Skilled Trades and Crafts, the institution's mission is the national management of waste, which it carries out with the help of municipalities. Today, nearly 5,000 companies have joined the SDK for their waste management and the institution has extended its mission to approaches that go beyond waste management with initiatives such as *Clever Akafen* (Clever Shopping) that promotes smart and sustainable consumption, or the launch of the *Flécken a Léimen* (Repair and Lend) platform, which encourages the repair and loan of objects as an alternative to traditional consumption.

In 1995 the non-profit organization *Valorlux* was launched by distributors, importers and producers to organize the collection, sorting and recycling of household packaging. Today, the association has more than 1,000 members. Finally, following the transposition of two European directives that made the collection and treatment of used electrical and electronic equipment mandatory, 43 Luxembourgish importers of these devices came together in 2005 to create the non-profit organization *Ecotrel*, which handles this sector throughout Luxembourg.

A major study commissioned by the Government in 2014 from the specialists EPEA (Environmental ►

01. The treatment of certain types of waste represents a particularly complex challenge. Since the middle of the 80s, Luxembourg has had structures to deal with it: *SuperDrecksKecht*, *Valorlux* and *Ecotrel*. These three associations share their expertise with businesses and the public, through advice and awareness-raising campaigns.

02. We speak of industrial symbiosis when the waste from some becomes the resource of others. The French company *CelluloPack* manufactures biodegradable and compostable food packaging from waste paper and cardboard.



INTERVIEW
CHARLES-ALBERT FLORENTIN
Cluster manager, EcoInnovation

“
Our goal is to bring companies with the same concerns together.
”

What are the EcoInnovation Cluster's priorities in 2018?

“We have two: the management of urban resources and more specifically managing the flows of water, energy and waste in towns; and the circular economy, for which we have decided to concentrate our work on plastics (eco-design, re-use ...) and on demolition waste in which we are working with the University of Luxembourg and LIST. Our goal is to create a market for secondary raw materials and to integrate the principles of the Circular Economy into the design of new buildings.

How do you work on these issues with your members?

For plastics, we organized a workshop in December 2017 for industrialists to work on their value chain and find circular solutions. Since then, we follow-up individually with every company that asks. There are several working groups within the cluster. Our mission is to bring together companies with the same concerns – for example, energy production or waste management – and to ensure that the various exchanges form the basis of a solution. For greater efficiency, we integrate our work with that of the Materials & Production and Wood clusters.

What is the interaction between your cluster and the new Greater Green Meta Cluster?

Greater Green was created in 2016 to raise awareness among SMEs and research centres about the need for cross-border cooperation, to increase the international visibility of the GreenTech sector in the region and to promote local business exports. We represent Luxembourg in its steering committee. LIST and Neobuild are also members. Each component of the Greater Region proposed work themes at the Meta Cluster: biogas for Wallonia, water for the French "Grand Est" and energy efficiency for Germany. We have for our part, submitted the theme of Circular Economy in relation to plastic waste and demolition. We found that companies in each region were already working on all these topics and that their actions needed to be coordinated to become more efficient.”



INTERVIEW
SÉBASTIEN ZINCK
SENIOR ENGINEER, LIST, ERIN
(Environmental Research and
Innovation) dEpartment

“
If the cost of recycling is high and the quality of the recycled material is low, the model has to be reviewed.
”

What tools does your department develop for supporting effective resource management?

"LIST is a Research and Technology Organization (RTO) whose mission is to develop innovative solutions in response to market needs. For example, we develop specific tools and methods to assess the potential environmental impacts of solutions in areas such as eco-design and recycling.

What are the limits of the circular economy and the system's weaknesses?

Circular systems are generally more sustainable than linear systems, but it is important to properly evaluate their environmental performance. For example, in the case of a recycling process, it is necessary to consider energy and water consumption and CO2 emissions, including transporting the waste. It is also necessary to look at the quality of the recycled material obtained at the end of the chain. If the financial and environmental costs are high and the quality of the recycled material is low, the model is likely to be revised ... Then, we must pay attention to a possible "rebound effect". In a "product as a service" model, since the product remains the property of the company, there is a risk that users are less careful and that maintenance costs are ultimately higher; this could weaken the financial balance and the environmental relevance of the model.

Do you think it is realistic to eventually eliminate the whole concept of waste?

In terms of waste reduction, there is still enormous room for improvement. Much more work needs to be done upstream to avoid generating waste, through eco-design and through working especially on the shelf life and recyclability of products, and downstream on improving waste treatment. For example, there is a huge amount of work to be done on plastics, only 9% of which are recycled globally. Europe is doing better (30%), but a large part of this recycling has so far been done in China. This country has recently decided to reduce the import of waste very sharply. It is possible to get close to a "zero waste" level if adequate political, economic and industrial efforts are made, but reaching a "zero waste" level will never be technically possible."



Photo: Fairphone

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Protection Encouragement Agency) entitled "Luxembourg as a knowledge capital and testing ground for the circular economy", can thus be seen as a logical continuation of these initiatives and as a further step by the country towards being considered as a recognised expert in the subject. The results of this 400-page study were published in early 2015. These reflections on the circular economy were then naturally integrated into the National Strategy on the Third Industrial Revolution of which they constitute one of the cross-cutting themes (with the Smart Economy and the "prosumers and social model" theme). This led to the identification of four priorities to transform Luxembourg into a circular nation: taxation, training, public procurement and new business models: each of these priorities being the subject of a strategic working group. At the end of 2017, the various working groups published a progress report and announced a series of concrete measures to be implemented, such as the creation of a skills centre that would list all the projects already completed and that would be available to all new promoters of circular economy projects; the development of a guide listing the questions to be asked in public tenders to assess the "circular" dimension of suppliers' proposals; the development of an educational offer adapted to

03. The FairPhone is the first modular phone in the world, designed with a view to sustainability. It is distinguished by the ease with which it can be repaired, a guarantee of long-term use. Its screen can, for example, be replaced in less than a minute. All 6 modules that make it up, from the battery to the audio jack, are permanently available.

04. ArcelorMittal's sheet piling, which can be rented under "product as a service", has many advantages. For construction companies, rental, salvage and renewal costs are significantly lower than those of a typical purchase. For ArcelorMittal, sheet piling leases save a new production cycle, consume fewer raw materials and less energy, and produce less CO2. ArcelorMittal has developed several service centres where used sheet piling is carefully reconditioned, to maintain the quality of the product for future construction sites.



Circular Economy Agenda

- June 2018: workshop on the circular economy and plastics organized by the EcoInnovation cluster followed in September 2018 by a workshop on plastic waste in the Greater Region organized by the meta cluster Greater Green (the precise dates will be communicated on www.luxinnovation.lu/media/all-events)
- 22–24 October 2018: World Circular Economy Forum (Yokohama, Japan)
- 30 October–1 November 2018: Circular economy Hotspot 2018 (Glasgow, Scotland)
- 27–30 November 2018: Pollutec 2018 (Lyon, France) International Trade Fair for Environmental Equipment, Technologies and Services



Photos: ArcelorMittal

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various educational levels; and, led by the Ministry of the Economy, the identification of the obstacles encountered by private companies in the development of business plans incorporating the precepts of the circular economy.

Beyond this impetus and this affirmed desire to create a framework conducive to the development of the circular economy – a role that often falls to the public authorities, it is businesses and entrepreneurs who are in action on the ground. Their initiatives illustrate a variety of possible ways to make circularity a reality.

PRIMING THE CIRCLE

According to Charles-Albert Florentin, manager of the EcoInnovation cluster since September 2017, *“The state of the planet’s resources would need us to build a completely new model of society to have a sufficient impact on their preservation. However, anything that can be done in the right direction, even modest, is to be encouraged.”* A growing number of companies in Luxembourg are becoming aware of their environmental responsibilities and acting to promote circularity and the more reasonable use of resources.

According to some European studies, the priority actions of SMEs concern the management of waste,

probably because this is among the easiest to implement, hence the rather widespread but incomplete notion that the circular economy just means recycling. It can take many other forms. Some long-standing businesses, engaged on the path to circularity, are beginning to transform their business models to make them more sustainable and more responsible. This is the case of *ArcelorMittal*, for example, which now offers to rent its sheet piling in addition to traditional sales. Other companies have been created directly from a circular business model, such as the *CupSystème* start-up that offers reusable cups to event organizers.

REUSE, REPAIR, RECYCLE:

1001 WAYS TO MAKE CIRCULARITY

At all stages of a product’s life cycle it is possible to introduce circularity. At the supply stage, sustainable and circular behaviour consists of preferring bio-sourced materials that have been extracted or harvested with respect for the environment (in a reasonable quantity and without compromising their renewal), or even have a positive impact upon it. This is what *Peintures Robin* do with two of their projects. The first is to produce wall paints made entirely of biodegradable natural plant products, certified ►



Rent your jeans don't buy them

The Dutch entrepreneur Bert van Son created his jeans for rent business in 2013. The principle is that of a subscription. For 7.50 euros per month (plus 20 euros registration fee at the start), customers can rent jeans of their choice and return them whenever they want to choose another, more fashionable or just newer. Used jeans are recycled to remake new jeans. The company retains ownership of the raw materials and jeans contain on average 50% recycled material.

More information: www.mudjeans.eu/lease-a-jeans



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C2C (cradle to cradle) by the EPEA design office, and the second was awarded the 2017 Fedil Innovation Award, in the category “Environment”. *“This project is called ‘We protect water with our paints’. It is a circular system. With the help of the Chamber of Agriculture and the multi-municipality water syndicates, we have been looking for farmers willing to grow non-polluting flax crops on land close to water sources. This flax then produces oil with which we make paint. The beneficial effects are thus multiple: we provide additional income for farmers, we protect water sources, we obtain a renewable and healthy natural resource and we create employment”* said Gérard Zoller, CEO of *Peinture Robin*.

Sustainable sourcing also includes choosing materials that are resistant to wear and tear and will not need to be renewed too frequently, and pooling certain services amongst several companies. In Luxembourg, several economic activity zones are already at an advanced stage of thinking on this type of organization, and already sharing car parks, fitness rooms, company restaurants and even crèches, with common management of energy consumption, water and waste treatment. These are, for example, the Salzbaach zone in Wiltz, recognized as the “capital” of

the circular economy in Luxembourg (see the Mayor’s interview on page 53), the Ecoparc in Windhof and the Eselborn-Lentzweiler zone.

PRODUCTS CONCEIVED IN A DIFFERENT WAY

Eco-design involves integrating environmental concerns throughout a product’s life cycle and imagining its future after the first cycle of use: easy replacement of parts, easy disassembly, reuse of components ... There are several examples in the Luxembourg construction sector: the specifications for the Luxembourg Pavilion at the 2020 Dubai World Expo included an obligation to reuse its various elements at the end of the exhibition; ArcelorMittal has recently stated that its new headquarters in Kirchberg will be entirely built using demountable and reusable modules; in the same district, the Kirchberg Fund, with the help of the specialized consultancy *+ImpaKT* and of people from a wide variety of backgrounds (creative industries, trade, renewable energies ...) is revolutionizing the way it designs future housing, by integrating scalability criteria to adapt it to the future profiles and needs of the inhabitants over several generations.

Photo: Tale Me



Photo: Carloh!

06.

Eco-design is also at the heart of some packaging and biodegradable products, and devices such as *FairPhones* – completely demountable to be repaired piece by piece ...

Circular modes of production also incorporate the industrial symbiosis of ensuring that one's waste becomes a resource for others; or by using recycled materials (or secondary materials) to replace raw materials. Goodyear does this, for example, by printing 3D tires from rubber powder obtained from used tires.

DON'T SELL PRODUCTS ANYMORE, SELL THEIR USE

One of the most frequently mentioned ideas, especially in the study of the Third Industrial Revolution, is the concept of "Product as a service", that is to say that companies no longer sell products but the benefits they provide. This is particularly promising because in most sectors, many business models can be revised in this way. We have already mentioned *ArcelorMittal* leasing sheet piling; *Contern* rents a range of concrete products; *Bamolux* carpentry does the same with removable partitions... If there are ►

05. The Belgian company Tale Me has created the first clothing rental service for maternity (pregnancy and breast-feeding) and for children from 0 to 6 years old. Two periods of life during which clothes are worn for a very short time. Tale Me has the ambition to offer fashion and trends combined with ethical and sustainable consumption.

06. The sharing economy (here a Carloh! sharing car) is a form of circular economy when it consists in mutualising the use of a good or a service, thus making better use of existing resources.



INTERVIEW
FRÄNK ARNDT
MAYOR, city of WILTZ

“**Having a positive impact on the “health” of citizens, the environment and the local economy.**

Your municipality has agreed to become a hub of the Circular Economy, including building an Eco-district. Why is a town like Wiltz interested in this approach?

“Wiltz sees itself as the regional capital of the Ardennes and wishes to get involved in sustainable development for the entire Northern Region of the Grand Duchy of Luxembourg. The municipality is indeed very proud to have the official title of a “circular economy municipal hotspot” in the Grand Duchy since October 2015. Since then, several pilot projects have started to position Wiltz as a national skill centre in the circular economy, such as developing, with the Housing Fund, a new 27-hectare urban eco-neighbourhood. In concrete terms, the aim is to guide all future economic activities in Wiltz so that they have a positive impact on “health”: that of the citizens, that of the natural environment and that of the local economy. The methodology of the circular economy will allow the municipality of Wiltz to give itself a framework for structured development to implement its ambitions in the future.

Have you come across many obstacles in implementing this project?

Indeed, we have faced many obstacles in concretely implementing the various projects we have initiated since October 2015. But this is not about blockages due to any ill will from any of the many people involved, but simply technical or methodological issues that need to be analysed in a structured and voluntary way to develop innovative solutions and models for the future. We have met many companies interested in the prospect of long-term development offered by the Circular Economy and we benefit as a hotspot from very proactive support from the various Luxembourg state bodies. It takes energy and a certain idealism to engage resolutely in this way, but faced with the global challenge of sustainable development, a public actor such as a municipality must be innovative and actively work to improve its global footprint and thus assume its responsibility towards future generations.”



INTERVIEW
MORGANE HAESSLER
PROJECT MANAGER, INDR

“The circular economy links economic and environmental aspects.”

Do you think that the adoption of circular business models is part of Corporate Social Responsibility?

"Absolutely. A company that applies the circular economy is naturally part of sustainable development. However, Corporate Social Responsibility (CSR) is defined as the contribution of companies to the three pillars of sustainable development, namely economic, social and environmental. The circular economy links the economic and environmental aspects. A company that reinvents its products and processes and improves its recycling has better control over its impact, develops its innovation capabilities and ensures its economic sustainability. Being able, as a company, to create value for oneself while preserving the society on which we all depend, is the goal of CSR.

What do you make available to companies to help them on this path?

The INDR, in collaboration with the main national actors in CSR, has developed the "Socially Responsible Enterprise" (SRE) Guide which summarizes the main concepts and themes of CSR. Available for free online at www.esr.lu, this informative and easy-to-use book gives explanations in the form of technical sheets. One chapter of the SRE Guide is entirely devoted to the circular economy. Companies, regardless of their size and sector, is

invited to question itself on various points: Do its products meet the principles of eco-design? What is the environmental impact of its production processes? Does it use low environmental footprint components in its production? What is the environmental impact of its packaging?

The SRE Guide allows companies to assess their level of responsibility, make links with existing initiatives, e.g. Flécken & Léinen and Fit 4 circularity, and accompanies business leaders to the SRE label in order to confirm and assess their level of responsibility. Several SRE-labelled companies have reached very high levels in these subjects and their good practices regularly serve as examples in the training, round tables and conferences that we organise."



07.

many examples in the field of construction, more and more start-ups have been set up using this principle, such as the Belgian company *TaleMe* which offers pregnancy and children's clothing on subscription or the Luxembourgish start-up *KouniToys* who rent games and toys. The same logic prevails in car sharing projects like *Carloh !*, *Flex (CFL)* or *City Mov'*. The sharing economy can indeed be a form of circular economy when it consists of pooling the use of a good or service, thus making existing resources more profitable. In these models, manufacturers or sharing platforms remain the owners of the products and thus responsible for maintaining them in good working order. In return, they receive a recurring income (rent or subscription) instead of a single income (sale). Manufacturers have thus a strong interest in making solid and sustainable products which are replaced less frequently, and which therefore guarantees less use of raw materials.

These new models require the development of "reverse logistics", bringing the goods back from the customer to the manufacturer, whether for repair or to make available to other customers. This is a challenge but also an opportunity for Luxembourg to develop more and more sophisticated logistics solutions.

A WORLD WITHOUT WASTE

The ultimate ambition of the circular economy, in addition to preserving resources, is the elimination of the very notion of waste. In this area several initiatives show the way. The gradual phasing out of

07. The OUNI grocery store is one of the few outlets in Luxembourg to sell food, cleaning and hygiene products without packaging or in reusable packaging, such as returnable bottles. OUNI is also a meeting place that regularly hosts workshops and events on assorted topics, ranging from waste prevention to recycling, DIY and upcycling.

08. *Dono* is a range of products designed by the Luxembourg designer Julie Conrad to reuse the tarp that covered Adolphe Bridge during its rehabilitation work. Thus 100.000 m² of plastic are given value instead of being considered as waste. This project has received the support of the Ministry of Sustainable Development and Infrastructures, of Luxinnovation, the Wiltz Circular Economy Hot Spot and the Luxembourg Creative Industries Cluster.

Photo : Pierre Guersing

Photo: Marie-Hélène Trouillet



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plastic bags in stores and the opening of unpackaged grocery stores like *Ouni*, which started in the neighbourhood of Luxembourg City station at the end of 2016, and which is now actively challenging its customers to go ‘zero waste’.

Waste, if it re-joins the production line, is no longer waste. This is what *Tarkett* does when it weaves new carpets from its own used and recycled products; as does *Dono*, created to give a second life, in the form of lamps and bags, to the tarpaulin that covered the Pont Adolphe bridge during its rebuilding work; and the French shoe manufacturer *SoftIn*, whose uppers are knitted from yarn made by recycling PET bottles.

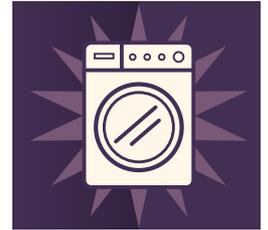
Since consumers are an important link in the economic circuit they can also contribute to hunting down waste by attending a *repair café* or using the www.flecken-a-leinen.lu platform devised by the *SuperDrecksKecht* with the Administration of the Environment, Chamber of Commerce, Chamber of Skilled Trades and Crafts, INDR (The National Institute for sustainable development and corporate social responsibility), *Ecotrel* and *Oekozenner Pafendall*. It connects individuals (or companies) wishing to have an object repaired, with a professional who can offer this service.

DESIRABLE EFFECTS

If the benefits of all these practices are, in terms of preserving the planet’s resources, quite obvious, what are the expected economic benefits?

On a global level, a study by *Accenture* estimates the savings achievable by adopting circular models (materials, recycling, repair) at more than \$4.5 billion by 2030. As for Luxembourg, the potential savings are estimated between 300 million and 1 billion euros. EPEA’s study for the government at the end of 2014 estimated the creation of 2,200 jobs, mainly in the construction, automobile, industrial, finance, logistics, R & D and administrative services sectors. But, beyond these figures, what interests the country is the ripple effect that the circular economy can have. As this requires rethinking business models as well as manufacturing processes, it has great potential for innovation of all kinds, and therefore economic diversification, including for a largely tertiary economy such as Luxembourg’s; We have seen this with the example of reverse logistics that is to be developed but new needs will also emerge in terms of finance/insurance, especially to accompany the logic of renting/leasing in the “product as a service” model. Among the significant collateral benefits, we might also mention less dependence on external resources, a reduction in the ecological footprint and the positive image of a precursor country.

For companies also, the benefits are many. Thinking about a circular model is like looking at the efficiency of one’s processes, so doing more and better with less. Ultimately, this logic necessarily has a positive impact on productivity and competitiveness, which are so much in demand in the context of the debate about growth in Luxembourg. Finally, ►



The indestructible

Just graduated, a young French engineer has devised an indestructible washing machine, conceived piece by piece. The indestructible is a model kit, easy to repair or improve over time, because all its elements can be unscrewed. The front panel, removable without tools, can be customized throughout the 50 years of its expected life. The electronic features can be updated by connecting to a computer. In case of breakdown, everyone will be able to consult the site of the indestructible to make a self-diagnosis, order a spare part and follow an appropriate installation tutorial.

More information: <http://lincrevable.com>

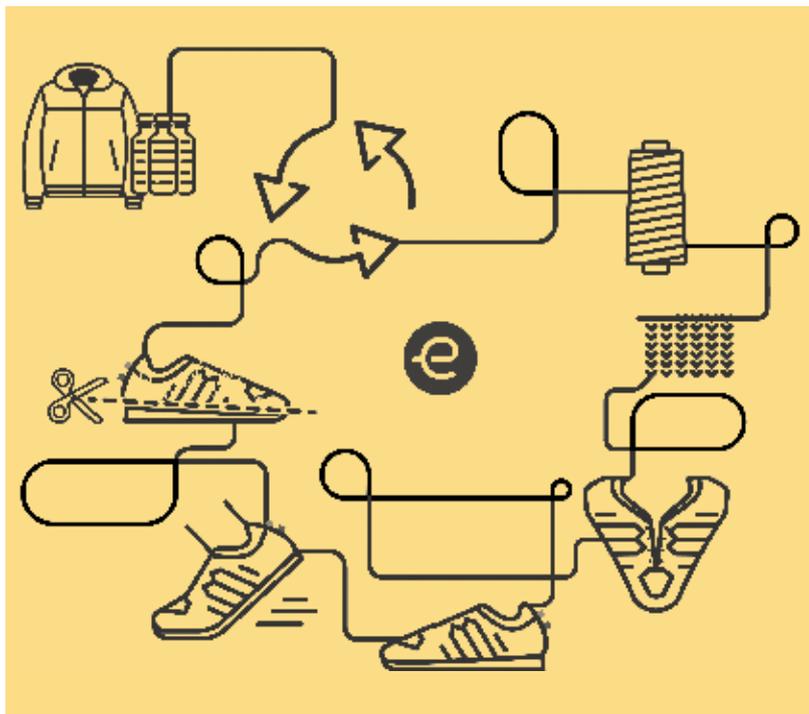


Schéma: SoftIn

09. Circular life cycle of the ector shoe, manufactured by SoftIn. The fibre of the shoes' uppers comes from recycled textiles and plastic bottles. The sole is made of recycled rubber. At the end of the product's life, the two parts of the shoe can be easily separated to begin in a new cycle of production.

in the “product as a service model”, the “service” dimension creates customer loyalty.

At the end of 2015, the number of Luxembourg companies actively involved in the circular economy was estimated at between 20 and 30 and the number of jobs directly or indirectly linked to between 7,000 and 15,000.

FROM THEORY INTO PRACTICE

What should companies who wish to follow the pioneers do? “*The first thing to do is knock on our door,*” says Charles-Albert Florentin, manager of the EcoInnovation cluster (see interview page 49). “*We can give information and connect you with the right partners depending on the nature of the project. For companies that want to go further in the study of a new business model, we have developed, with the Ministry of Economy, the Fit4Circularity programme to help them develop their own concept of circularity.*” It is a 4-step process, ranging from an analysis of company's internal processes to implementing circular principles, by detecting possibilities (optimized use of raw materials, product lifespans, new business models ...) and the definition of a roadmap. The programme involves experienced counsellors accredited by Luxinnovation. This consultancy is invoiced at 10,000 - 20,000 euros, of which 50% is paid by the public agency, which accompanies the companies throughout the process. At the end of the process, the company can also request assistance from the Ministry of the Economy to finance an R&D programme. It should be noted that European funds can also be released

for these activities. The EcoInnovation cluster can advise interested companies.

Without necessarily needing to completely revise a company's business model, using the advice and services of the *SuperdrecksKecht (SDK)* can be a promising idea to, firstly, better sort more of the waste produced by the company. With several thousand member companies, the association has unparalleled experience in terms of waste management and waste production (sorting, recovery, reuse ...) but also provides advice on waste prevention. To go further, it has developed an indicator to calculate the potential for producing new products, based on recycled products. And, in the area of sustainable and responsible purchasing, the SDK is also at the origin of the *Clever Akafen* initiative, namely the identification of ecological and sustainable supplies (batteries, light bulbs, office supplies, toilet paper ...) labelled “*Products recommended by the SuperDrecksKecht*” The SDK sells a binder made from the final processing of refrigeration equipment insulation and is currently testing bio fuel in its own heating systems from used cooking fats.

For other purchases, the website oekotopten.lu lists environmentally friendly goods with reasonable energy consumption. It is intended for the general public, but it nevertheless includes two sections for professionals: office and professional devices.

STILL MANY QUESTIONS TO POSE

The rise of circular models is accompanied by numerous questions of a legal, educational, and even philosophical nature: How to better identify a product's components, while respecting intellectual property and manufacturing secrets? Where and how to store secondary materials from the deconstruction of buildings or the dismantling of products? How to trace these materials? Which are the professions that will appear thanks to the development of these new models and what training will be needed? Can we conceive of indicators to measure the efficiency of using resources? To what extent should we regulate, for example, by introducing more environmental criteria into public procurement?

Or, should we, on the contrary, remove certain standards which are too restrictive, for example in construction? How can we mutualise more services between companies, whilst guaranteeing data security and confidentiality? How do we move from a culture of possessing something to a culture of using it? How do we write contracts for these new transactions?

These questions show the extent to which everyone in society is concerned and that all (administrations, companies, civil society, associative world ...) have a role to play in building a new societal model which gradually puts an end to the waste of the resources. ●