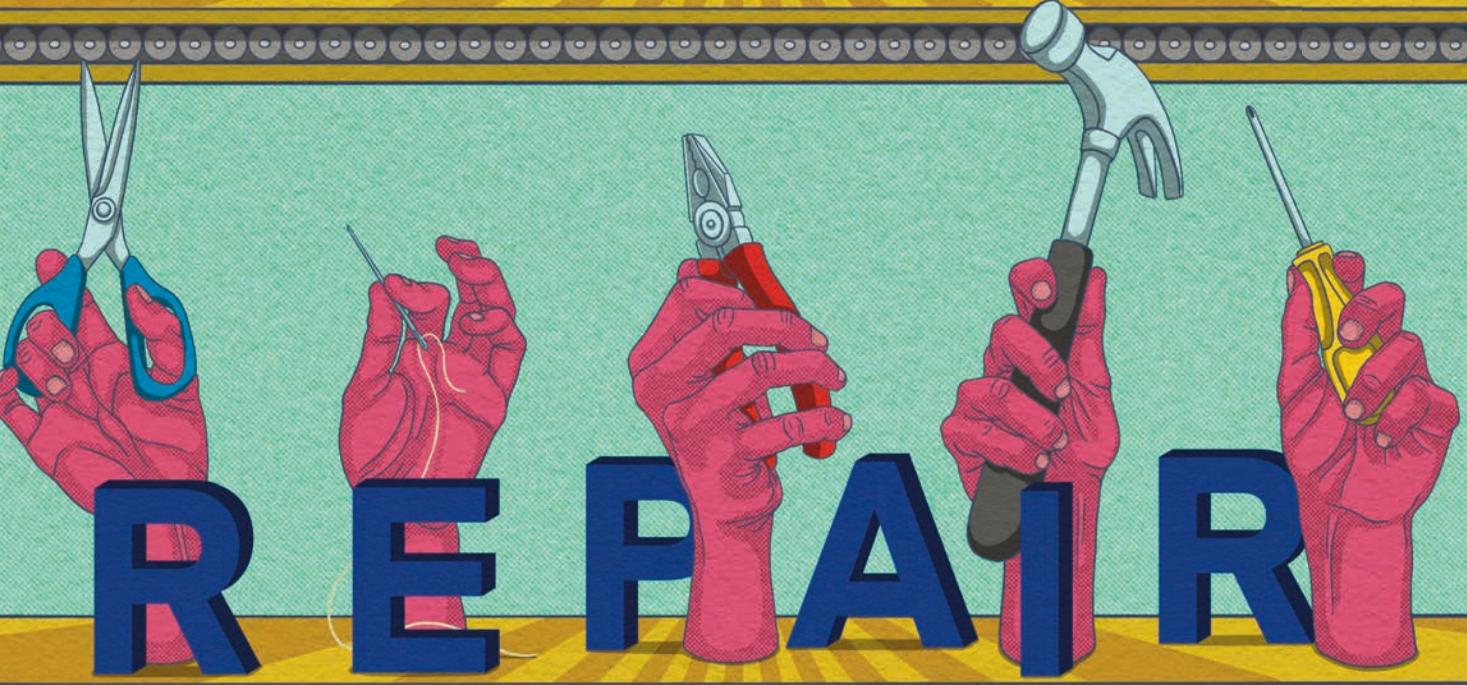


Cover Story

Circular economy



The road to resilience

TEXT Hoai Thu Nguyen Doan / Corinne Briault
TRANSLATION FROM FRENCH: Martin Davies / Hannah Ekberg

For three centuries, the mass consumption habits of today's societies have been fuelled by the exponential extraction of natural resources. The recent COP 26 as well as the work done by various organisations around the world (including the United Nations Environment Programme - UNEP) show that the rate of exploitation will soon become unsustainable: Humanity is consuming more natural resources than the Earth can produce. The present linear economic system is becoming obsolete and will be unable to meet the needs of future generations in either the medium or the long terms. In this context, the transition to a more sustainable circular economy is a necessity and, at the same time, an economic, societal and environmental opportunity. As a partner to businesses, the Chamber of Commerce has initiated a new opus with its news & trends publication dedicated to the circular economy (*Actualité & Tendances n°26 - L'économie circulaire au Luxembourg: passer de la théorie à la pratique*), to support its members in their transition to a more resilient model. This article is both inspired by and outlines, this work.

Today's linear economic model first came into being towards the end of the 19th century, a period which saw the birth of consumerism and the availability of cheap raw materials, both of which were to act as motors for economic growth in the most developed countries. The linear model, which follows the logic of 'extract - produce - consume - discard', became an extravagant aspect of these years of plenty. This system of production and consumption does not optimise the use of resources, it causes negative side effects and it generates quantities of waste that can no longer be eliminated, whilst a shortage of raw materials looms on the horizon. It has become unsustainable, which is why we need to move towards a more sustainable model - that of the circular economy.

While there is no consensus on a single definition of the circular economy, everyone nevertheless agrees on a broad outline: the circular economy is a concept that is part of a framework for sustainable development that aims for sobriety in the consumption

of resources and the mitigation of environmental impacts. In this context, the aim is to produce goods and services while limiting the consumption and waste of raw materials and energy sources, and to create feedback loops between products, services, waste, materials, water and energy to make the economy more efficient and less dependent on the extraction of new resources. Eliminating the concept of waste is one of the key objectives of the circular economy, which seeks to systematically revalue all resources and production residue in order to make new physical or energy raw materials.

Four action points, seven practices and numerous benefits

The circular economy is based on four main action points: increasing the lifespan of products (e.g., favouring the repairable and the recyclable, setting up standards to put an end to planned obsolescence, etc.); reducing environmental impact and accounting for environmental costs (e.g., charging for negative side effects); transitioning from an economy

of possession to an economy of functionality; and finally, substituting non-sustainable products with more sustainable alternatives. These four action points translate more concretely into seven common practices which are being adopted throughout the world and which we will describe in the following paragraphs. Their implementation has already given rise to numerous studies, supported by quantified results that are detailed in the Chamber of Commerce's news & trends bulletin on the circular economy in Luxembourg (*Actualité & Tendances n°26 - L'économie circulaire au Luxembourg: passer de la théorie à la pratique*).

Sustainable sourcing consists of exploiting resources (agricultural, forestry, mining, energy, etc.) in an efficient manner, which is to say by respecting the biosphere's capacity for renewal, by limiting waste from exploitation and by minimising environmental impacts, whilst respecting decent health and safety conditions. In this context, whenever possible, the use of recycled raw materials (or 'secondary raw materials') should be prioritised. Sustainable sourcing makes it possible to avoid the negative side effects likely to be generated by production processes which can affect both the environment and human beings (pollution, depletion of the planet's resources, accidents at work, etc.). Indeed, the extraction, for example, of certain strategic rare earth metals can provoke real environmental and health challenges. Often, these negative side effects are not accounted for in an economic calculation of the costs of production. These costs



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are, however, far from negligible. Besides averting negative side effects, sustainable sourcing has several benefits for companies. The process provides more resilience in the face of price fluctuations in raw materials, particular those of petroleum-based products. In addition, the practice of sustainable sourcing constitutes a sales argument permitting companies to positively reposition their products in a context where consumers are increasingly sensitive to the impact of their consumption choices. Finally, by practicing sustainable sourcing, a company can present a positive image, making it more attractive in the recruitment market whilst also maintaining high staff satisfaction and motivation.

Eco-design is a practice that consists of taking into consideration, from the design stage, the environmental impacts of a product or service throughout its life cycle. This involves considering such factors as the choice of components and raw materials; the technologies used during the product's manufacture, maintenance, use and disposal; the lifespan of the product; the possibility of recovering component materials at the end of life; and an analysis of user

behaviour. Eco-design permits the optimum use of resources whilst extending the useful lifespan of products by making them in a way that they can easily be repaired, reconditioned and recycled. For companies, this approach makes it possible to save resources whilst limiting the costs associated with the end-of-life management of products, resulting in improved margins. In addition, eco-design reinvigorates innovation within companies and is likely to give them a positive image and a competitive edge. In this regard, it should be added that, for consumers, eco-designed products that can easily be repaired present an advantage especially if they are expensive to begin with or if they require significant regular maintenance. In addition, the possibility of reconditioning opens up new markets based on the sale of refurbished products. In addition, following an eco-design approach allows a company to anticipate increasingly stringent environmental requirements set by governments and markets while responding to the growing demand for environmentally friendly products and services.

Industrial and territorial ecology consists of pooling the resources of economic actors

in the same locality – in areas ranging from an industrial park to an entire region – in order to produce savings and increase productivity (i.e., to maximise the amount of wealth or goods produced in relation to a unit of raw material used in a production cycle). It is about creating inter-company flow loops, which is to say an 'industrial symbiosis', via, for example, the sharing of infrastructure, equipment, services or raw materials. Synergies between companies can consist of pooling or substitution practices. Thus, the collective management of waste collection, the sharing of logistics, the pooling of orders to benefit from wholesale prices, or the establishment of collective catering, are examples of the pooling of incoming and outgoing flows. Substitution is a mechanism in which the flow leaving one company is used as a flow entering another: the waste of one company thus becomes the raw material of another whilst heat released in one industrial activity can become the energy fuelling the business of a neighbouring company.

The functional economy substitutes ownership of a good with services related to its use, so as to maximise value and usage,



while minimising the resources consumed. In this context, instead of selling a product, a company will make its use available to customers in exchange for a monetary consideration. It also ensures the handling of this product. Common examples of this model are the launderette or businesses paying for a number of photocopies rather than buying a photocopier. The functional economy is a potential solution to the principle of planned obsolescence – that is, the set of techniques aimed at deliberately reducing products' lifespans in order to increase their replacement rate and promote future sales – which is both resource intensive and harmful to the environment. This business model, by encouraging moderation, is a step towards decoupling the need for resources from economic growth. Indeed, within the framework of a functional economy, a seller of services has an interest in products being as durable as possible whilst reducing the

01. 03. For three centuries, the mass consumption habits of present-day societies have been fuelled by an exponential extraction of the Earth's natural resources. According to the study *'Luxembourg as a knowledge capital and testing ground for the circular economy'* carried out by the international institute EPEA on the basis of consultation with more than 50 stakeholders in Luxembourg, the deployment of circular economy principles to the construction, automotive, artisanal and crafts, finance, logistics, R&D and administration sectors, has the potential to generate savings of 300 million-1 billion euros per year in raw materials, while creating more than 2,200 jobs in the years to come.

02. Sustainable sourcing consists of exploiting resources (agricultural, forestry, mining, energy, etc.) in an efficient manner by respecting the biosphere's renewal capacities, by limiting operating waste, and by minimising the environmental impact.



Olivier Vassart
CEO ArcelorMittal Steligenge,
ArcelorMittal Luxembourg

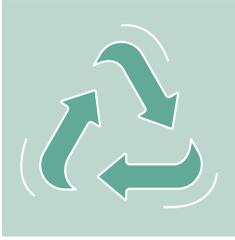
'ArcelorMittal aims to produce carbon-neutral steel'

ArcelorMittal has been involved in multiple economically circular projects for many years. What is the aim of this process?

In fact, this approach is almost natural since steel, unlike most other materials, can be recycled endlessly without losing its qualities. It is the most recycled material in the world because it is easy to recover. Ultimately, through a whole range of initiatives, ArcelorMittal aims to produce carbon-neutral steel. In this context, we have launched the *XCarb* initiative which brings together the full range of our decarbonisation activities under one brand to show the significant role that steel plays in the circular economy. For example, our *XCarb Recycled and renewably produced steel* is made with 100% recycled materials using renewable electricity. This gives it an extremely low CO₂ footprint of around 300 kg of CO₂ per tonne of finished steel compared to the world average of 2,300 kg. In Luxembourg, 100% of the raw material needed for manufacturing comes from used steel, which is given a new life cycle. Thanks to the installation of electric furnaces, particularly at the Luxembourg sites, the transformation makes it possible to be competitive as costs are reduced, particularly in producing sheet piles and girders. We are seeing a strong development in the use of these 'second-hand' steels and the rental of sheet piles used for earth support in construction.

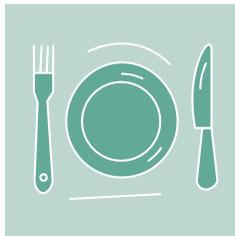
Recently you collaborated on the FRESH project. How does this sustainable/circular approach fit in?

Our collaboration with the IFSB and the CEDC group for the FRESH project started in the initial stages of the project. Located on the roof of the IFSB restaurant, this urban greenhouse combines several interesting things that come under our corporate responsibility approach: building a structure on a roof is a technical challenge that requires the use of very light materials – steel has therefore naturally found its place there; reducing CO₂ emissions from both the construction and agricultural sectors by combining energy sharing and local food production; distribution in short circuits, particularly in the company restaurant located just under the greenhouse; and finally the approach of urban farming as an innovative solution to promote the circular economy. FRESH should serve as a reference for many future construction projects in the Greater Region.



A mine of information!

www.economie-circulaire.lu, the portal for the circular economy in Luxembourg, was launched in summer 2021. This platform makes it possible to share information related to the government's strategy for a circular economy and is continuously supplemented and full of information on multiple initiatives related to the circular economy, the production and exchange of goods and services, and the creation of socio-economic value based on the circular management of stocks and flow of materials, considering the limits and regenerative capacities of our planet. It is also possible to subscribe to a newsletter (in English only) providing a wealth of national and international information on the subject. Exciting and informative!



The circular economy served up on a plate

According to the Food and Agriculture Organization of the United Nations (FAO), 'the rate of food lost after harvest during on-farm activities, transport, storage and processing is 13.8% worldwide'. One way to avoid this waste, while thinking circular, is to be a 'locavore'. This movement advocates eating food produced within a radius of up to 100-250 km from your home. It reduces the environmental impact of agricultural activity, creates jobs, reduces distances and production-distribution circuits, and offers more choices for fresh produce. In Luxembourg, the *Sou schmaacht Lëtzebuerg* initiative aims to open consumers' eyes to Luxembourg products and producers: 180 establishments (restaurants and communities) have already joined the initiative and are committed to offering menus made from Luxembourgish products.

■ More info:

<https://www.sou-schmaacht-letzebuerg.lu>



04. 05. Eco-design not only optimises the use of resources, but also the useful life of finished products, by creating products that are easily repairable, reconditionable and recyclable. For example, steel is the most recycled material in the world because it is easy to recover. ArcelorMittal is committed to numerous circular economy initiatives, such as its participation in the FRESH urban greenhouse project in Bettembourg. The steel giant also aims to make the life cycle of buildings more sustainable in order to design buildings that are easy to assemble and disassemble.

© 05: ArcelorMittal

06. 07. More and more initiatives are emerging to fight against the principle of planned obsolescence, i.e. the set of techniques aimed at deliberately reducing the lifespan of a product in order to increase its replacement rate and promote future sales.



consumption of resources (either for production, operation or handling). In this way, a company's margins will be higher, and its competitiveness improved. For companies providing services, enacting the principles of the functional economy helps stabilise and sustain their business in the long term, as service contracts relate to planned and, hence predictable, durations. This ability to anticipate future business activity is a significant advantage, especially in a context of volatile commodity prices. In addition, the development of an offer focused on the functional economy is an opportunity for companies to increase their 'intangible wealth' by innovating and developing their staffs' skills. To all this we might add a revitalisation of a company's business when it is pushed to broaden its horizons in terms of partnerships and markets. For the customer, the functional economy maximises value in

use and liberates them from management and handling constraints. If the client is another business, having recourse to services to meet a need rather than buying the associated goods, allows them to concentrate on their core business, and also combat the rapid obsolescence of some of their technological equipment.

Responsible consumption is the act of public or private buyers making purchasing choices taking into account the impact of a product or service on health, the planet and society at all stages of the life cycle of that product or service. In this context, criteria such as eco-design, reparability, availability of after-sales service and spare parts, sourcing and employees' working conditions become vital when making a purchase. This type of consumer choice is becoming easier and, over time, different labels, such



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‘The circular economy, being a relatively new discipline, may be wrongly perceived as just another economic theory that does not have a concrete application beyond the walls of conference rooms’



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as eco-labels, develop, because they give more visibility to products and facilitate the choice between various products and services compared to the customary financial, environmental and social criteria. With the growing awareness of the impact of consumption on health, the planet and society, consumers are increasingly demanding organic, eco-responsible and fair-trade goods and services. The responsible consumption market is growing strongly. Thus, in Luxembourg, the turnover generated by sales of fair-trade labelled products increased by 27% in 2017 over the previous year, which shows the potential for further market share to be captured. In addition, there is a desire to develop responsible consumption in the area of public procurement. In February 2014, this resulted in the European Union adopting a directive on public procurement aimed at, among other things, facilitating the

integration of sustainable development objectives into public procurement procedures. In Luxembourg, the promotion of the circular economy through public procurement is one of the key measures of the government's roadmap, in line with the Third Industrial Revolution (TIR) strategy.

Extending the useful life of a product involves recourse to maintenance, reuse, reemployment and reconditioning. It implies markets related to repair, resale and even donation. The ease with which a product can be disassembled or repaired, and the availability of spare parts, then become differential criteria when choosing products to purchase. The success of second-hand shops, dedicated websites (for example, ifixit.com) and flea markets, as well as the development of DIY tutorials, forums and structures to allow anyone to repair their

equipment themselves (e.g., ‘repair cafes’), reveal a growing demand for extending products' duration of use. Driven by the Internet and its networking platforms, new practices – such as the trend for vintage fashion or the resale of unwanted Christmas gifts on the second-hand market are developing. New markets are growing and goods, especially when they are expensive to buy, must now be designed so that they are repairable when damaged, rather than thrown away for a new purchase. Extending the duration of use allows consumers to save money while significantly reducing their environmental footprint. For businesses, extending the duration of use helps build customer loyalty.

Recycling consists of recovering waste and transforming it in order to reintroduce it totally or partially into the production cycle. It includes upcycling practices that turn products and materials that are no longer in use into materials or products of higher quality and/or utility. In the circular economy, recycling is an act of last resort in that the primary objective should be to move towards a ‘zero waste’ model which would render this concept obsolete. According to the white paper of the FEDEREC (the French federation of professional recycling businesses), one ton of wastepaper can produce 900 kilograms of recycled paper while two to three tons of wood are needed to make one ton of conventional paper. In other words, one ton of recycled paper saves seventeen trees, twenty litres of water and the equivalent of a thousand litres of oil. The potential of recycling in terms of saving resources is clear. A business can gain competitiveness through recycling. Indeed, waste disposal is a cost. However, the existence of a recovery channel makes it possible to transform waste into raw materials and thus generate



Georges Kieffer
Founder and Director,
BENU Village

'A place of participation, integration and cooperation'

What is BENU Village (pronounced 'be new')?

BENU Village's mission is to create the first eco-village in the Greater Region. If we want to talk about sustainable development, circularity, COP 26 and local resources, we must also show what does not work and propose alternatives, inspire and motivate, integrate and cooperate. BENU Village is being built with as few new resources as possible and aims to be a place entirely devoted to the socio-ecological circular economy. We have thus established a charter that is based on the values of transparency, social responsibility, local production and ecological excellence. With this in mind, we collaborate with all those who want to conduct their activities in accordance with these values. BENU Village is therefore a place of participation, integration and cooperation.

Businesses such as BENU Couture, BENU Restaurant and BENU LaSA are or will be launched. What are their objectives?

In the logic of the village, it is a question of pointing out overconsumption and of showing and documenting the alternatives without being dogmatic. BENU Couture recovers old clothes to create new ones. By avoiding the reuse of synthetic fibres, we help reduce the amount of microplastics that are released into water. To our knowledge, we are the only ones to grant a lifetime guarantee on all our products, with the aim of presenting a demonstrative alternative to planned obsolescence. The future BENU restaurant will prepare succulent organic culinary creations using fresh merchandise that is shunned by supermarkets for visual reasons (i.e., 'ugly' vegetables, editor's note). The current BENU shop will be transformed into BENU LaSA (Local and Social Art) to exhibit and sell creations by BENU and its partners.

What are the other businesses that will develop in the future?

There will be BENU Menuiserie, where artists and carpenters will recover and transform furniture into functional design pieces. Then, the benureuse.lu site, which is already active, where anyone can donate second-hand items of all kinds as long as they are in good working order. We have conducted a lot of research in order to be able to make this site rather unique by presenting a lot of advice and facts on reuse: is the reuse of a particular object really more ecological than its controlled dismantling or even its demolition, etc. ... And BENU Metamorphosis, an artistic participation project transforming the eco-village into an alternative space of art and discovery. Everyone can participate! In fact, we have a lot of projects at the 'new' or 'pilot' stage that we intend to present throughout 2022.



08. 09. 10. 11. With the growing awareness of the impact of consumption on health, but also on the planet and on society, consumers are increasingly demanding organic, eco-responsible and fair-trade goods and services. Recycling is now part of everyone's daily life.

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income instead of producing costs. Recycling is therefore a factor of optimisation and competitiveness. It also allows companies to reduce their need for new raw materials, which translates into less sensitivity to price volatility.

The circular economy at the heart of international strategies

The United Nations placed the circular economy at the heart of the 17 sustainable development goals of its 2030 Agenda for a more resilient economic and social future. At the same time, the green transition is currently one of the key themes of the European Commission's work programme, which works to strengthen the 'Circular economy package' adopted by the European Parliament in April 2018.

In Luxembourg, extensive economic growth has been based on the continual growth of factors like labour and capital. Resilience is absent from this model, which has to feed on significant amounts of resources, the gradual depletion of which has already been felt in the high volatility of commodity prices over the past decade. An economic bottleneck inevitably looms on the horizon.



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To reconnect with more qualitative growth while maintaining a high standard of living, Luxembourg has initiated numerous works to build a more resilient and inclusive economy and society. The country has implemented its TIR strategy, which continues with the 'Luxembourg Strategy' unit and aims to establish a smart circular economy on the promising foundations of the latest information and communication technologies. In addition, there is a strong political will to engage in the green transition. The latter is considered to be one of the three strategic pillars of the national plan for recovery and resilience, while the Coalition Agreement for the period 2018-2023 contains more than twenty points relating to the circular economy.

Published in February 2021, the Circular Economy Strategy Luxembourg is based on the 'Luxembourg as a knowledge capital and testing ground for the circular economy' study commissioned in 2014 from the specialist firm Environmental Protection Encouragement Agency (EPEA). The 400-page strategic document notes that, being poor in natural resources and materials, Europe is highly dependent on imports. As a

result, 'European industry, and Luxembourg in particular, is constantly at the mercy of increases and fluctuations in the price of raw materials, shortages or even total unavailability. (...) [by the way] The Covid 19 crisis has exposed the vulnerability of many international supply chains'. The circular economy is therefore essential to ensure a production model that is both profitable and competitive. To deploy it, a roadmap is provided proposing a set of tools and methods for six key sectors (food and biomaterials, construction, education and training, finance, industry and the commercial sector). The document notably provides for the establishment of a centralised governance structure to bring together, connect and stimulate all the national circular economy initiatives. It mentions the existence of three state tools to encourage the transition to a more sustainable economy, namely: regulation and the establishment of standards; financial incentives; and knowledge management. The document is based on a participatory process and was developed using the concepts previously evaluated during pilot projects. It is an open document intended to be supplemented as it is implemented in order to incorporate newly acquired

experiences and ensure its alignment with changes in national and international economic reality. Ultimately, the document aims to position Luxembourg as a dynamic centre of the circular economy.

Luxembourg, fertile ground

Luxembourg is a favourable place to deploy the circular economy. It has good conditions for the creation of circular loops and the development of industrial symbiosis. Being both at the crossroads of Europe and the heart of the Greater Region, Luxembourg benefits from its excellent geographical position; its multiculturalism (in 2021, 73% of the workforce were non-Luxembourgish and 46% of the workforce were cross-border workers); an extensive network of economic partnerships (it is the most open economy in the European Union), and strong experience in cooperative processes. These conditions are more than conducive to the development of circular interactions and material flow loops. Thus, there is already a great deal of circular cross-border collaboration in various fields such as transport, health, vocational training, regional planning, research and higher education. The CIRKLA initiative, for example, was set up on 1 June 2021. Meaning 'circular' in Esperanto, it consists of interregional collaborations to pool and develop knowledge and practices in the circular economy in the field of materials and raise the Greater Region as a centre of excellence.

Even if, by virtue of its modest size, Luxembourg will not 'save the planet' by reducing its environmental impact, it can nevertheless play a critical role as a laboratory where innovative circular practices are developed and evaluated. The country benefits from a responsive government, a willing citizenship and an ideal size to develop knowledge and know-how relating to the circular economy and thus build a robust economic capital which will eventually lead to the export of services based on environmental expertise. In this context, Luxembourg constitutes an ideal breeding ground to launch pilot projects to test and perfect circular



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'There are already pioneering initiatives in Luxembourg that were launched several years ago and which, even at the time, already formed part of a circular logic'

strategies on a small scale before scaling them up. To promote the deployment of the circular economy and the data economy, in 2019 Luxembourg launched the *Product Circularity Datasheet* initiative, joined by some fifty companies from 12 countries. In this context, a standardised data sheet template concerning the circularity of products has been designed to facilitate the sharing of information between the actors in a value chain, in order to maximise the use of products. This tool initially developed and tested locally, subsequently became an ISO/ NP 59040 global standard.

Pioneering initiatives and favourable infrastructures

Another advantage for Luxembourg is that there are already pioneering initiatives in the country which were launched several years ago and which, at the time, already formed part of a circular logic. For example, the *SuperDrecksKëscht* (SDK) was set up in 1992. A co-creation of the Ministry of the Environment, Climate and Sustainable Development, the Chamber of Commerce and the Chamber of Skilled Trades and Crafts, the SDK was entrusted with the national management of what was once considered



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waste but now are considered resources. Today, nearly 5,000 companies have joined this organisation, which helps them manage the by-products of their business with a view to creating new value. The institution has extended its initial mission with initiatives such as *Clever Akafen* (for the promotion of smart and sustainable consumption); the *Flécken a Léinen* platform (to encourage the repair and lending of objects as an alternative to traditional consumption); and the design of the 'resource potential calculation tool' used to assess the quality of certain 'secondary' raw materials, i.e. recycled/upgraded materials, to reinsert them into circulation in new forms. The non-profit organisation Valorlux, another pioneering initiative, was launched in 1995 by distributors, importers and producers wanting to organise the collection, sorting and recycling of household packaging. Today, the association has more than 1,000 members and obtained ministerial approval in April 2000. Finally, following the transposition of two European Directives which made the collection and treatment of used electrical and electronic devices compulsory, 43 Luxembourg companies who import this type of equipment came together in 2005 to create Ecotrel, which manages this sector throughout the country.

12. 13. 14. 'Locavorism' came out of California in 2005; it is a movement advocating the consumption of food produced within a maximum radius of 100-250 km of your home. Whilst many stores avoid food waste by no longer hesitating to put ugly or end-of-life fruits and vegetables on their shelves, there are still some that do not meet the criteria for large-scale distribution and so some canteens and restaurants put them on their menus.



Hugo Zeler
Beekeeper, *Hunnegkëscht.lu*
(Honey Box)

'Beehives raise awareness of the problems linked to biodiversity and pollination'

How did the idea of setting up beehives in the city come about? What is the goal?

I started my professional career in aeronautics and at the same time, thirteen years ago, I became interested in beekeeping, with a few beehives in orchards in the *Trois Frontières* area. Then, four years ago, I decided to devote myself entirely to beekeeping and since I moved to town, it was obviously natural to bring the beehives with me! Today, the apiaries are installed in different districts of Luxembourg City on the roofs of certain companies: in Kirchberg, for example, on the roof of the Sofitel Europe hotel. The benefits are multiple. First, the honeys come from the flowers and vegetation of the neighbourhoods, which gives them different flavours. Then, the late mowing initiative of certain green spaces in the city has its advantages because it allows the bees to live better and acclimatise well. Finally, the goal is also to raise awareness of the decline of bees, which are essential for the pollination of many plant species. Whenever I set up beehives, I systematically ask companies to plant flowers, plants or trees nearby, which also helps to protect biodiversity. I give them a lot of advice on the planting of vegetation because very often people do not realise that certain plants are perfect for bee colonies. There is therefore also an 'educational' interest.

How do you see the future of your business?

The future of agriculture is complex in general, and for apiaries it is also increasingly difficult. Climate change has a huge influence on production. This year for example, with the weather conditions not being optimal this past summer, the honey harvest was down by 50% compared to last year. The visits to the beehives and the facilities that I organise also allow me to do a lot of work to raise awareness of the problems related to biodiversity and pollination, it is an effective way to make everyone aware of the importance of all these themes linked to the environment.



Fashion ... in a circular fashion!

If, up until now, circular fashion has only rhymed with specialist second-hand shops, the idea of integrating circularity into business models has actually become an imperative for many players in the sector. Internet sites such as Vinted are experiencing strong development and major brands such as department stores are also embarking on the circular path. Demonstrating this new awareness, dedicated spaces are now flourishing for major brands and stores (Galeries Lafayette or Printemps in Paris), or in shopping centers (the Pall Center in Oberpallen). Initiatives that are entirely devoted to this way of consuming are increasing and are increasingly popular with consumers. As for the big fashion brands, they follow ... fashion! Some now offer extensive analyses of their sustainability performance.



The plane goes green

When Bertrand Piccard made the first solar-powered flight around the world in July 2016, his speech underlined that his aircraft, Solar Impulse, had achieved a first for energy even more than a first for aviation. This historic flight highlighted that clean technologies can achieve seemingly impossible goals and should be used more to reduce energy consumption and protect natural resources. Many designers are currently working on projects for 'clean' aviation that is more respectful of the environment. Some of these are circular but still at an experimental stage. The big airlines are already experimenting with planes flying with new carbon-free energy sources (hydrogen, solar, etc.). For example, Airbus and researchers at the University of Munich are studying the development of biofuels from algae. Not only do these algae absorb carbon dioxide from the atmosphere to grow, but turning them into fuel allows for a sustainable energy cycle.



15. 16. Many sectors are now interested in the circular economy. Major brands and shopping centres help the fashion industry integrate circularity into its economic model with clothing resale sites, second-hand spaces or by creating new designs from old clothes.

17. 18. Upcycling is the recovery of materials or products that are no longer used in order to transform them into materials or products of higher quality or usefulness. Making something new out of the old can apply to many sectors.



'The Chamber of Commerce has deployed a wide range of initiatives dedicated to the circular economy and sustainable development'

Along with these avant-garde initiatives, the country also benefits from excellent infrastructure capable of supporting the deployment of the circular economy. In particular, it has mechanisms to produce knowledge (e.g., the ERIN Department of the Luxembourg Institute of Technology, working groups, think-tanks, public consultations, etc.) and to share it, both professionally (e.g., clusters, networks of experts, events organised by the Chamber of Commerce, etc.) and educationally (e.g., training from the House of Training, a Master's degree in sustainable development, and certifying evening courses offered by the University of Luxembourg, etc.). In addition, good environmental practices are encouraged and recognised through the issuance of labels and awards (e.g., the Socially Responsible Company label, the *SuperDrecksKëscht fir Betriber* label, the Luxembourg Green



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Business Award, etc.). Finally, Luxembourg has a set of infrastructures aimed at supporting companies in the implementation of circular principles and practices promoting economic resilience (e.g., the Fit4Circularity programme, state subsidies, publications, events and training, etc.).

Financing facilities

As an international financial centre and European leader in sustainable finance, Luxembourg has the facilities to finance projects relating to the circular economy. In 2007, it issued the world's first green bond, which earned it the title of pioneer in the field of green finance. Following this, in 2015, the Climate Finance Task Force working group was set up to develop solutions relating to sustainable finance. Labels such as the Climate Finance label or the Green Bond label were then created and the Luxembourg Green Exchange, the world's first stock exchange specialising exclusively in the listing of ecological financial products, opened in 2017. Two years later, it received the Green Bond Pioneer Award confirming its pioneering role. Finally, the Luxembourg Sustainable Finance Roadmap was published in October 2018. The document draws up an inventory of the already existing initiatives in sustainable finance and outlines the foundations of a resilient

financial strategy to help respect the Paris Agreements while achieving the 17 Sustainable Development Goals of the United Nations.

A circular transition already underway

Taking advantage of the favourable framework in Luxembourg, many companies have already integrated circular economy principles into their business models (see *Success Story, Startup*, and *A&T 26*). Several Luxembourg municipalities have done the same to make their day-to-day management processes more resilient. In the north of Luxembourg, the municipality of Wiltz constitutes, for example, a 'municipal hotspot for the circular economy in Luxembourg', where multiple projects giving pride of place to the circular and sustainable economy have been developed since 2015. Other municipalities are now following suit encouraged by various government initiatives such as the Climate Pact 2.0, or the myenergy Solar Challenge competition.

Challenges and solutions in deployment

For Luxembourg's circular transition to progress, it will nevertheless be necessary to overcome three major challenges:

translation, adaptation and evaluation. First of all, we must encourage cautious companies to embark on their green transition. The circular economy, being a relatively new discipline, may be wrongly perceived as just another economic theory which does not have concrete application, particularly by small businesses (SMEs) whose resources in terms of personnel, time and money are limited. The lack of consensus at national, European and global level on the definition of the circular economy also contributes to a certain vagueness around the subject, noticeable through a profusion of data.

Then, it is necessary to ensure that the change will be supported. The green transition involves a profound transformation of consumption, production and living habits and depends on the goodwill of civil society, businesses and public authorities, as well as their ability to collaborate. It constitutes a radical paradigm shift to move from the current linear model to a new model which involves the creation of loops, and which therefore requires new interactions, new knowledge and know-how, new laws and new infrastructure, etc. To help its members in this pivotal period of the green transition, the Chamber of Commerce is carrying out various actions such as the launch of new webinars; the organisation and participation in international fairs (e.g., Pollutec, Abu



Régis Bigot

Architect– Innovation Project
Manager Neobuild

‘This brick is part of a fundamental movement that is economically circular’

You have been working for a few months on manufacturing Geobloc, a 100% Luxembourgish and eco-circular brick. Can you tell us more?

In fact, we started working almost two years ago, particularly with the ministries, to work out how to use soil excavated from construction sites and to develop it, because this soil represents several million m³ each year. In collaboration with the Swiss company Terrabloc, we developed Geobloc. The idea is to be able to use local clay and soil excavated from construction sites, process them and use them as new building materials. The advantage of Geobloc is that in using locally available materials, we save transport costs and limit the excavation volumes that traditionally would be thrown in landfills. Stabilised with lime or cement and compacted by a mechanical press, the raw earth is thus transformed into bricks and blocks which make it possible to design resistant and durable habitats. This brick is also part of a fundamental movement that is economically circular, and which benefits from a generalised ecological awareness: we give a second life to local excavation waste which is recycled for local sites with the objective of not exceeding 200–300 km from the production site. The ideal would obviously be for all sites to be able to supply themselves.

How is this brick produced?

We found a partner to carry out the project and manufacture the Geobloc products: Carrières Cloos, which already had an adapted site and the necessary handling equipment, and which invested in a mobile production line. Some of the Cloos staff are seconded to brick manufacturing, accompanied by a technical manager who has already worked for the Terrabloc company.

How do you see the future of Geobloc?

Currently, the economic model is artisanal, and we pool certain investments and development costs with other professionals doing the same work. It is important for us to remain consistent with localised sales, otherwise we lose part of the circular character. In the future, it will mainly be a question of minimising production costs and finding partners so that manufacturing becomes more industrialised and to do this we are entering into discussions with a major Luxembourg player active in the manufacture of other construction products. We regularly invite architects and design offices to visit pilot projects so that they adopt this technology in their work, and we are very proud to say that we have been manufacturing for a few months now for our first three projects in Luxembourg.



Dhabi Sustainability Week, etc.); regulatory and legal monitoring via opinions on draft laws and Eurochamber consultations; dedicated publications; and even the organisation of workshops within its Sustainable Development Working Group for Luxembourg's sustainability principles (see www.cc.lu).

Finally, due to the lack of indicators and measurement tools, it is difficult to assess Luxembourg's progress in its transition to a more resilient economy. Such elements would, however, make it possible to assess the effectiveness of initiatives in favour of the circular economy so that adjustments can be made, if necessary, as part of a 'learning from mistakes' approach. Concretely, visualising the progress of the circular transition would make it possible to demonstrate the many benefits, and more businesses could be encouraged to join sustainable initiatives whose feasibility and profitability have been clearly confirmed. To take stock of Luxembourg's transition to a more resilient economy, the Chamber of Commerce carried out a national survey of Luxembourg companies on the subject of the circular economy between 14 September and 4 October 2021: the S2-2021 *Baromètre de l'Économie* (see www.cc.lu).



19



20

19. The decline of bees and other pollinating insects is a worldwide phenomenon. However, they are responsible for the reproduction of more than 80% of plant species and are essential. Installing beehives in urban areas (and systematically planting seeds and trees for producing honey near them) contributes to conserving biodiversity, not to mention that beekeeping has always employed the principle of circularity as it is naturally based on reusing raw materials.

20. In construction, interest in the circular economy, which consists of reusing materials from deconstruction, is growing. In Luxembourg, Geobloc bricks are made from excavated soil from construction sites.

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On the right track

The circular economy has evolved from a little recognised economic theory in the 1970s, to a concrete resilience goal commonly adopted by major economies around the world. In a little more than 50 years, this discipline, which aims to decouple economic growth from the consumption of resources, has gained in substance by gradually gaining adherents in academic, technical, political, legal and geographical areas. For businesses, the economy's transition to a circular model is an opportunity to achieve both monetary and non-monetary gains. The search for resilience is an opportunity to build a virtuous circle in which business models develop and become more efficient, new markets open up and unprecedented commercial and financial opportunities emerge. In this context, companies, by simply conducting their business, can generate social and environmental impacts which in turn have positive impacts in the economic sphere.

The various initiatives that exist in Luxembourg show that there are many ways to put the circular economy into practice, and

this allows any entity, regardless of its size, business sector or its own characteristics, to choose 'à la carte' the elements it wants to use. Whether through sustainable sourcing, eco-design, industrial and territorial ecology, the economy of functionality, responsible consumption, extending the duration of use or even recycling, the pathways to resilience abound. In addition, borrowing to access these pathways is relatively easier in Luxembourg than in other countries which do not benefit from the country's advantages. —



4 action points - 7 practices

Find our detachable poster at the back of the magazine!