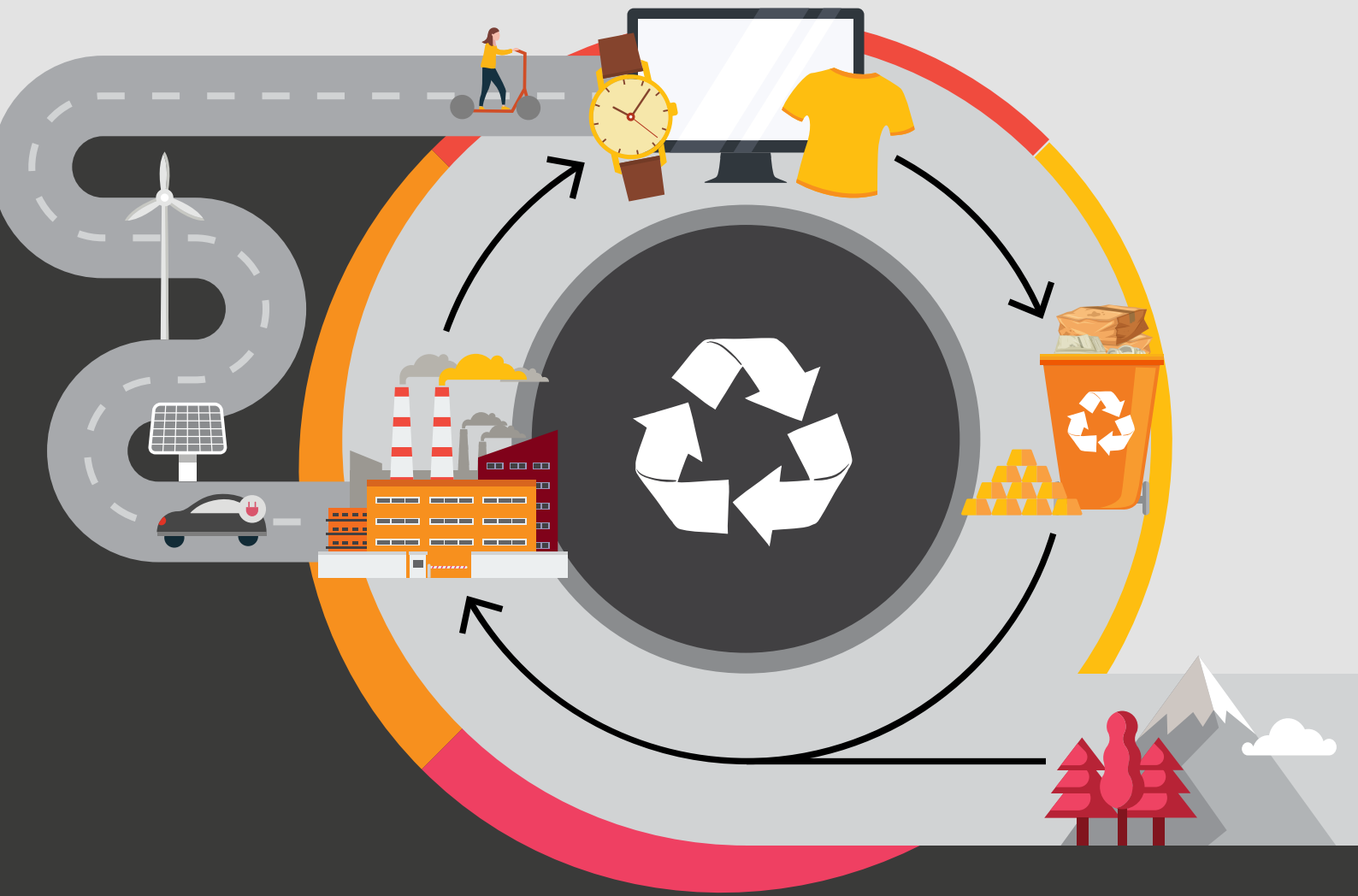


Circularity as the new normal

Future fitting Swiss businesses



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Foreword

Maintaining a resilient and sustainable planet within planetary boundaries – the case of Switzerland

Natural cycles developed long before the advent of humans: the water cycle, the fauna and flora cycle, the chlorophyll and CO₂ cycles. These cycles formed the foundations of our planet's ecosystems. They don't produce any waste: all 'lost' resources become food or building stones for other players.

Human societies grew within these natural cycles. Our societies have always had the objective of enhancing the value and utility of local stocks of resources under our control, like natural produce – plants, animals, gravel and rocks – as well as cultural riches and physical infrastructure, buildings and objects. It should be noted that the societies which maintained local stocks of resources were generally the ones that thrived.

The rise of the industrial revolution brought many welcome advances, e.g. in fighting diseases and reducing poverty. In stark contrast, it resulted in growing populations, fossil-fuel enabled industries and urbanisation enabling mankind to out-power nature, overloading its absorption capacity.

Today, circular economy strategies challenge the business-as-usual approaches of the linear industrial economy which continues producing new objects for sale. This prevailing desire for the incessant production and consumption of goods invariably has a negative impact on the wellbeing of nature.

Society and politicians continue to neglect the implications of exceeding our planetary boundaries. Ample evidence on climate change and devastating biodiversity losses show that human activity cannot continue on the same pathway in a 'linear economy'.¹ In short, the current systems born out of the industrial era are not sustainable if we don't address the costs at which they were achieved and move to circular models of society and economy.

By transitioning to modern-day forms of circular societies, nations can tackle challenges associated with the negative legacy of the Anthropocene² and the transfer of negative environmental externalities abroad by developing:

- innovative circular sciences – physics, chemistry and metallurgy – which do not discharge any synthetic molecules into nature
- circular economies which are built on maximising the use of stocks of objects through service-based models, and close the material loops on an atomic and molecular basis, discharging no objects or materials into nature which are incompatible with its circularity
- political framework conditions which also promote circularity for immaterial loops, like full environmental liability of producers for their materials and products, and which give preference to the use of renewable resources including human labour
- governance structures which preserve the global commons and give to nature what nature needs, like biodiversity and water cycles – to name but two elements – and regenerate natural systems.

Across the global north and south, countries exist under varying environmental, social, political, legislative and economic realities, and yet we all share and depend on the limited set of global resources provided by the Earth. We all have a role to play in safeguarding the wellbeing of nature and the resources for future generations of all species. If businesses, citizens and states strive to foster closed, slowed and regenerative loop economies based on regional culture and existing resources, they'll move one step closer to enabling humankind to prosper in the long run, respecting the boundaries of our planet. It's our decision. We determine our future.

- Walter R. Stahel

Executive summary

Our consumption of natural resources and use of materials are on a dangerous and unsustainable track: the global use of natural resources has more than tripled since 1970 and continues to grow, pushing climate stability and ecosystems worldwide to the limits of their resilience. Switzerland also contributes to this situation through its high per capita consumption of resources. This means that although Switzerland may recycle more waste than most of its European neighbours, it's also one of the largest consumers and waste-producing nations in the world. In order to meet the requirements for operating within the Earth's planetary boundaries, Switzerland would need to reduce its natural resource consumption by two-thirds.

Circular economy supports sustainable development by aiming to secure the resources to sustain our current and future generations. To allow businesses, policy-makers and citizens to navigate and evaluate different circular economy solutions, it's helpful to simplify and categorise circular economy options according to their resource focus. This white paper delves into the following resource strategies:

1. Narrowing: decreasing material and energy use per product
2. Closing: ensuring both production material (and resources) and the finished product can be – and are – recycled
3. Slowing: consuming less and using products for longer over time
4. Regenerating: cleaner loops and organisations contributing to leaving the environment in a better state than how it was found.

The different circular strategies present promising opportunities to build more resilient economies and societies. What's more, they help us

tackle inherent systemic risks that have been made starkly apparent in the wake of the COVID-19 pandemic and the current climate crisis. The paper integrates high-level analyses of several sectors from a circular perspective in order to analyse the benefits of circularity in five different sectors, their most suited resource strategies and obstacles that need to be overcome in order to become more – or ideally – fully circular. In addition, a number of innovation cases are presented to highlight current industry efforts.

According to our findings, the circular economy could present a multi-billion-franc opportunity for Swiss businesses with regard to recovered resource value, access to new markets and green investment funds, as well as the value created through new circular products and services. Simultaneously, such circular approaches can offset pressing resource, market, operational, business and legal risks associated with the current linear 'take-make-dispose' model. So, circular opportunities will let Swiss businesses and society balance current and future risks associated with the linear economy. The rethinking and redesign of current linear business models to circular ones will inevitably fuel a new wave of sustainable innovations which capitalise on advantages (e.g. derived from shorter supply chains due to a focus on more locally sourced materials, products and ingredients, and a reduction in the amount of materials used) but also a significant decrease in risks (e.g. less dependency on scarce resource supply and a decreased risk of losing customers due to their sustainability preferences). Thanks to circular solutions, Swiss businesses and stakeholders will be able to contribute to an economically, socially and environmentally resilient future.

So, on the one hand, circularity offers Switzerland a vehicle to make measurable progress for various sustainability commitments (Agenda 2030 and Paris Agreement 2015 etc.) and ultimately reduce its primary resource usage overall. On the other hand, it could be an enabler for Switzerland to make the most of its advantages (i.e. leading technical universities, high sustainability consciousness and access to financing) to catch up with countries in the EU and beyond, which are leading the way in circular strategies and implementation.

Despite efficiency gains, Switzerland is currently far from sustainable resource use. In order for Switzerland to make use of its advantages and accelerate the transition to a resilient circular society and economy, this white paper outlines recommendations in the following areas:

1. **Catching up on circular targets, action and policy**
2. **Going beyond recycling**
3. **Collaborating to address environmental hotspots**
4. **Innovating and experimenting for new circular models**
5. **Designing-in sustainability from the very beginning**
6. **Measuring and reporting for circular success**
7. **Using the finance sector to accelerate the circular transition**
8. **Developing the smart mix of voluntary action, cooperation, regulation and incentives**
9. **Developing a circular economy roadmap for Switzerland**
10. **Keeping the big picture in mind**

1. Introduction

“Basic economics shows that the planet simply cannot carry our linear production path any longer.”³

Circular strategies present promising opportunities to build more resilient economies and societies. What’s more, they help us tackle inherent systemic risks that have been made starkly apparent in the wake of the COVID-19 pandemic and the current climate crisis.

This white paper targets businesses, circular economy champions, NGOs and politicians to inform, inspire and incite more sustainable circular action across selected Swiss industrial sectors, namely food, textiles, financial services, pharmaceuticals, watches and jewellery. It contributes to the on-going discussion around circular strategies which reduce environmental and social impacts while making business sense. The white paper integrates high-level analyses of these sectors from a circular perspective and makes specific recommendations at business level as well as a 10-point set of recommendations for more circularity in Switzerland overall.

Please note that the sectors analysed in this report were selected on basis

of their ties to WWF Switzerland and PwC’s partners. We could envision writing further editions on other sectors in future versions.

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On the one hand, circularity offers Switzerland a vehicle to make measurable progress with various sustainability commitments (Agenda 2030, Paris Agreement 2015 etc.) and ultimately help it reduce its primary resource usage overall. On the other hand, it could be an enabler for Switzerland to make the most of its advantages (e.g. leading technical universities, high sustainability consciousness and access to financing) and catch up with countries in the EU and elsewhere, which are leading the way in circular strategies and implementation.

Despite efficiency gains, Switzerland is currently far from achieving sustainable use of resources.⁴ Global resource consumption is rising to untenable levels, threatening climate stability and pushing ecosystems worldwide to the limit. Switzerland contributes to this situation through its high per capita consumption of resources. In fact, studies show that Switzerland would need to reduce its natural resource consumption by two-thirds⁵ in order to meet the requirements for operating within the Earth’s planetary boundaries, i.e. within the safe operating space. This is particularly important in mitigating the climate crisis for which Switzerland has pledged to become climate neutral by 2050.⁶ Circular approaches can help us work towards these goals, for which business, society and politics have a central role to play.

PwC Switzerland and WWF Switzerland have joined forces with leading academics to bring you these insights, as we feel strongly that transitioning to a circular and more resilient economy and society requires a broad coalition of committed actors.

We wish you interesting and entertaining reading!

2. Circular economy: the basics

2.1 Tackling the planetary boundaries

More of everything – is that even possible? Our current global consumption and production system is rather linear and follows a ‘take-make-dispose’ model. It’s an extractive and resource-intensive model that disrupts the Earth’s system, breaching a number of key planetary boundaries (biodiversity, phosphorus and nitrogen levels) while other boundaries (climate change and land-system change) are at increasing risk (see Figure 1). So, the way we use natural resources is key to remaining within a ‘safe operating space for global societal development’.⁷ In other words, to making sure we don’t go beyond the limited biophysical capacity of our planet.

But, our consumption of natural resources and use of materials are on a dangerous and unsustainable track: the global use of natural resources has more than tripled since 1970 and continues to grow.⁹ The extraction and processing of natural resources is responsible for more than 90% of biodiversity losses, water stress, and approximately half of our climate change impacts.¹⁰ This negative trend is a matter of great concern. In addition, the social and environmental benefits and impacts of resource use are unevenly distributed across the planet, with many high-income countries, like Switzerland, transferring their negative environmental impact abroad, where most production takes place.

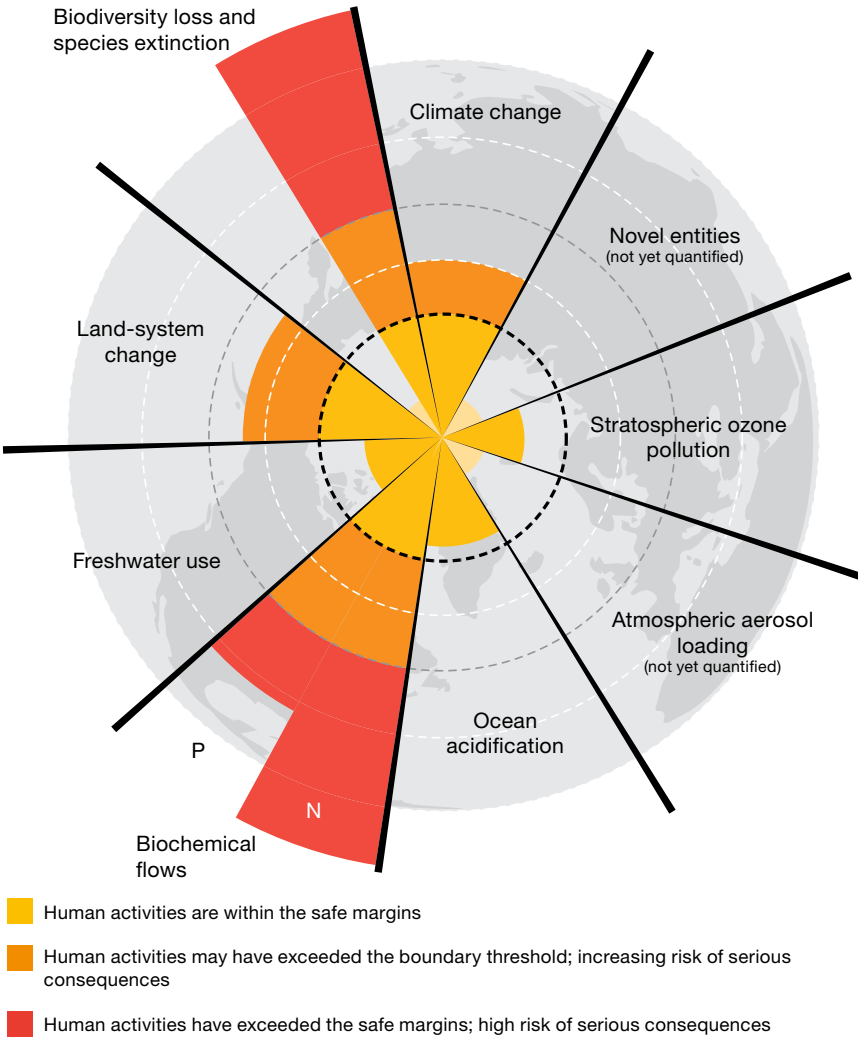
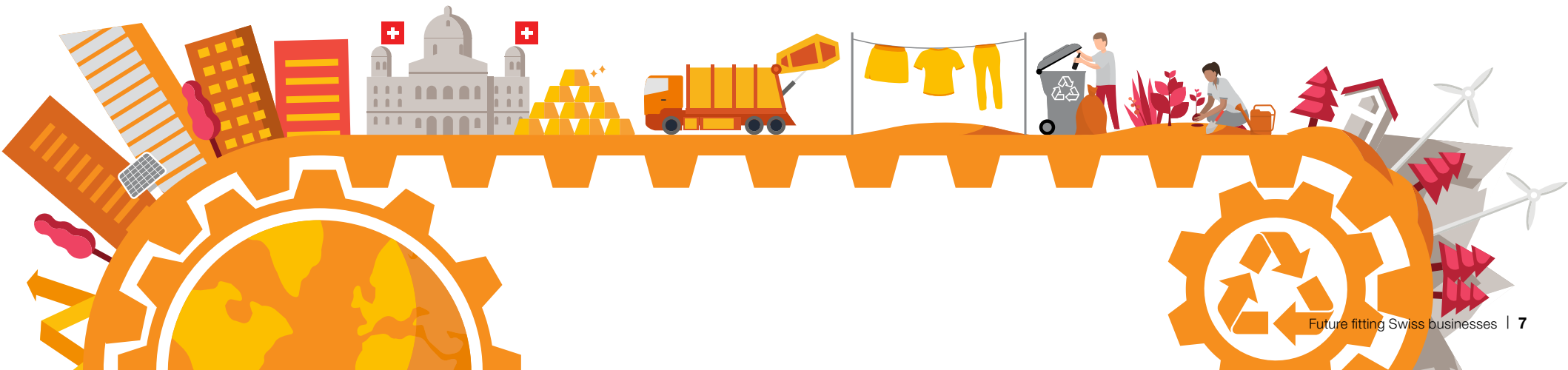


Figure 1: Current status – planetary boundaries. The yellow zone denotes a ‘safe operating space’, the orange is the ‘zone of uncertainty’ (increasing risk) and the red is a ‘high-risk zone’.⁸ This diagram is symbolic representation from 2015. It does not show the actual values to date. Source: Rockström et al, 2009a; 2009b; Steffen et al., 2015b

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2.2 Business risks of the linear economy

The effects of climate change, biodiversity loss and resource scarcity are becoming progressively more apparent.¹¹ NASA lists the following trends as symptoms of climate change: “increased heat, drought and insect outbreaks, increased wildfires, declining water supplies, reduced agricultural yields, health impacts in cities due to heat, flooding and erosion in coastal areas” and many more.

In the 2020 WWF-PwC Report “Nature is too big to Fail”, alarm bells rang, noting that “never in human history has biodiversity declined as fast as it does today. We are facing the sixth mass extinction and could witness up to 1 million species being wiped out by the end of the century.” Biodiversity holds key solutions to mitigate and adapt to climate change.¹²

These climatic changes are symptoms of the prevailing linear and often fossil-based ‘business as usual’ approach. If businesses don’t opt to adapt their business models towards more sustainable circular alternatives, they risk falling victim to future volatility in resource supplies and price, failures in the value chain and disruptive new business models.¹³

The FinanCE working group, consisting of several financial institutions interested in circular economy, categorizes the ‘linear risks’ as follows:

- **Market risks** refer to market and trade-related factors that impact the assets and liabilities of businesses, including price volatility, resource scarcity, trade bans, higher interest rates and lower investor interest etc.

- **Operational risks** refer to factors that present a threat to a firm’s internal operations, including failures related to the supply chain, internal processes or worker safety, as well as the difficulty to hire or retain talent etc.
- **Business risks** arise due to emerging societal, economic and political trends that affect the strategic business plan objectives of a firm, including changing consumer demands, new technologies and new business models etc.
- **Legal risk** results from the failure to comply with current or future regulations, including sourcing rules, new government policies, extended producer responsibility and fines or lawsuits.¹⁴

Global megatrends including disruptive technologies, a massively growing middle class as well as ongoing globalisation increasing the interrelation and altering the traditional roles of governments, businesses and citizens, don’t just increase such risks. They also provide new opportunities related to alternative economic models like the circular economy. Bearing in mind that a linear economy is tied to the concept of long-term economic growth, which is inconsistent with the concept of long-term ecological effectiveness, this shift is urgently needed.¹⁵ To prepare for the impending risks, businesses, politics and society must act now.



Negative externalities explained

Generally, negative externalities are external costs which are incurred by an unrelated third party as a result of an economic transaction. This includes waste and pollution leading to environmental degradation. As current production processes include the private costs incurred by the producer but external costs are passed on to society, companies have no incentive to rethink production decisions and reduce pollution. Instead, they are likely to produce more than the social and environmental optimum.

Today, most primary raw materials are often cheaper than secondary raw materials. This is largely due to the fact that negative externalities are not reflected in the price of primary raw materials.

Circular business models could help offset or reduce negative externalities, but only if the environmental and social considerations are designed into the production process. If these considerations are not incorporated in the development of a circular business model, these too may result in negative externalities.

Sources: PwC, 2019; Bundesrat Postulates 17.3505, 2020; PwC, 2020

2.3 Lost value in the linear economy

The current take-make-dispose system creates a shocking amount of waste, which from a circular perspective constitutes lost value. In total, some 65 billion tonnes of raw materials entered the global economic system in 2010.¹⁶ According to the Circularity Gap Report 2020,¹⁷ in 2020 this figure more than doubled to over 100 billion tonnes of primary materials entering the global economy every year, which equals 90 times the total mass of vehicles in the Swiss mobility sector. **Humanity’s resource use is currently 8.6% ‘circular’ – meaning that over 90% of our primary resources do not re-enter the resource circle.**

The majority of these value losses occur due to materials being thrown away and primary resource use associated with the food, mobility, housing and commercial construction industries (e.g. virgin automotive and construction material), as well as externalities like CO₂ (cost per tonne) or the non-cash health impacts of accidents, pollution and noise.¹⁸

This ‘lost value’ constitutes a major cost-saving opportunity through enhanced circularity. Based on detailed

product level modelling, a report from the Ellen MacArthur Foundation estimates that the circular economy represents a net material cost-saving opportunity of USD 340 to 380 billion per year at EU level for a ‘transition scenario’.¹⁹

2.4 The circular opportunity

Across the board, the lifespan of consumer products in Europe has been in decline.²⁰ A study by the European Environment Bureau (2019) estimated that extending the lifetime of all washing machines, notebooks, vacuum cleaners and smartphones in the EU by just one year would save around 4 million tonnes of carbon emissions annually by 2030, which is the equivalent of taking over 2 million cars off the roads for a year. In fact, the OECD estimates that over 50% of the global greenhouse emissions are due to material management of resources.²¹

Products like mobile phones and clothing are increasingly treated as ‘disposables’ with quick replacement rates, rendering the systems for dealing with the increasing levels of waste inadequate. What’s more, according to a European survey, 77% of EU consumers would prefer that

products are manufactured in a more robust and repairable manner, as a result reducing commodity turnover rates and its detrimental impacts.²² Although current systems don’t allow for this, consumers’ willingness for environmental considerations demonstrates ample opportunity for a future circular economy that provides better services to consumers,²³ but also tackles core sustainability challenges like climate change.

Although it has great potential as a solution for our global resource and economic issues, we need to remain critical about why the circular economy is put forward as a sustainable pathway in the first place: to meet human needs while minimising the associated environmental impact.²⁴ So, it’s important to focus on the environmental impact and resource usage when outlining the concept of the circular economy.

The circular opportunities for Switzerland specifically are discussed in section 4 of this white paper.

2.5 Defining a circular economy for sustainability

To let businesses, policy-makers and citizens navigate and evaluate different circular economy solutions, it's helpful to simplify and categorise circular economy options according to their resource focus. Here we introduce the following resource strategies: (1) narrowing, (2) closing (3) slowing and (4) regenerating resource loops.²⁵

We apply the following definition of the circular economy, which is in line with the sustainable development concept:

“Circular economy supports sustainable development by aiming to secure the resources to sustain our current and future generations.²⁶ This is achieved by minimising resource inputs and waste, emission and energy leakage of products over time, using four distinct strategies: narrowing, closing, slowing and regenerating resource loops.”²⁷

These strategies are outlined as follows:

Narrowing resource loops is about decreasing material and energy use per product. Many companies in the linear economy already engage in this strategy as it reduces costs and increases profit, but the eco-efficiency of designing and producing products in the right way can be very impactful. Light weighting products is a prime example of narrowing resource loops, like reducing the weight of an aluminium drinks can so it's lighter to transport, or reducing the weight of an aircraft for greater fuel efficiency.

Closing resource loops refers to the practice of ensuring both the production material (and resources) and the finished product can be – and are – recycled. It's generally accepted that recycling is a widely-used and successful environmental practice. While it's a significant and important strategy, it should be understood that for major global manufacturing materials like steel, cement, paper, glass, plastic and aluminium, recycling is complex and its assumed energy-saving effects are less clear. For example, aluminium drinks cans can be recycled in a near closed loop (with about 5% virgin material added), but these cans constitute just 1% of all aluminium use globally.²⁸

For glass, the recycling status and potential are high, but the energy savings of recycling are low,²⁹ so we must also focus on slowing the loop for greater environmental benefits. All the more so, because even if all waste could be recycled this would only cover one-fifth of the current material requirements.³⁰ This means that more innovative environmentally-friendly substitutes are needed.

Slowing resource loops is about using products for longer. It's associated with the higher strategies in the waste hierarchy like avoidance (of resource use), reuse and reduction. The goal is to create durable and long-lasting products which would in turn slow consumption and decrease resource use. Slowing the loop is potentially the most impactful environmental strategy, but it's also the most challenging one to implement because it requires a significant rethink of the business model focusing on 'value over volume' and from faster to slower forms of consumption.

Regenerating resource loops is about cleaner loops and organisations contributing to leaving the environment in a better state than how it was found. This involves: eliminating the use of toxic substances (substances that are persistent and liable to bio-accumulate), increasing the use of renewable materials and energy³¹ and seeking out 'net positive' strategies to leave the environment directly impacted by the production process in a better state (e.g. increasing biodiversity and remediating soil) than how it was found.

In order for circular resource loop strategies to be environmentally beneficial, sustainability must be designed into the business or operational process from the very beginning. This can be done by following guiding principles like those included in the European Eco-Design Directive,³² the Rapid Circularity Assessment³³ and the Resource Pressure Design Method.³⁴ These efforts should ideally be followed by more detailed impact assessments like life cycle assessments or mass flow analyses.

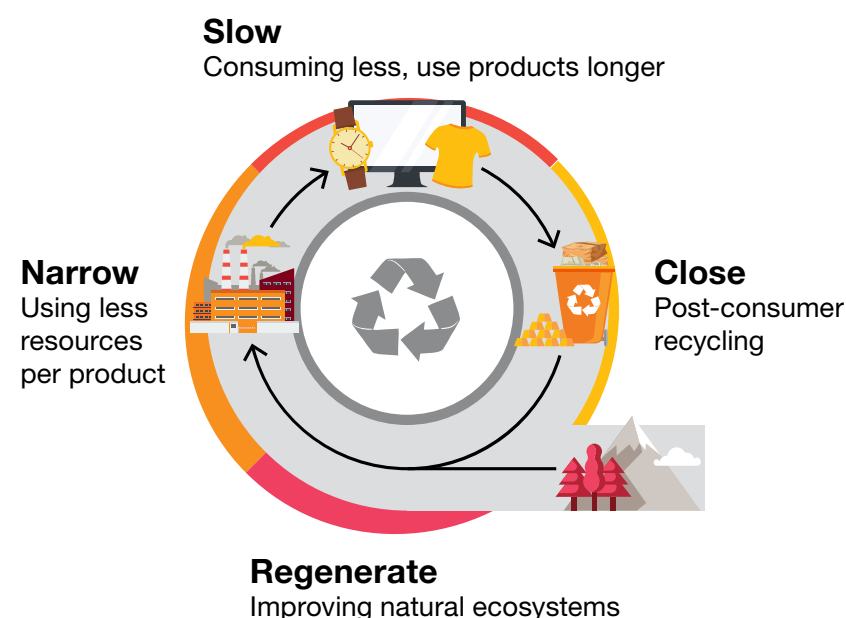


Figure 2: Defining circular resource-loop strategies. Source: Konietzko, J., Bocken, N., Hultink, E.J. 2020. A tool to analyse, ideate and develop circular innovation ecosystems. Sustainability, 12, 417. based on: McDonough & Braungart, 2002; Stahel, 2008; Bocken, Bakker, de Pauw, van der Grinten, 2016

3. Circular economy: in context

3.1 Switzerland

Switzerland is considered by some as one of the most innovative, wealthy and sustainable countries in the world according to selected international country rankings.³⁵ In 2020, it was ranked as one of the most innovative countries by the Global Innovation Index for 10 consecutive years running.³⁶ Switzerland is a high-income country, with the second highest per capita GDP in

2019 according to the International Monetary Fund.³⁷ And finally, the Environmental Performance Index (EPI) ranked Switzerland as the third most sustainable country globally, taking into account indicators on ecosystem vitality (biodiversity, climate change and ecosystem services) as well as health (air quality, sanitation, drinking water and waste management).³⁸

In theory, these characteristics – innovation, sustainability and wealth

– should lend themselves well to the development and uptake of sustainable circular innovations and strategies.

But in practice the picture looks very different. Particularly, when considering sustainability, much depends on the indicator chosen and the scope of the factors considered.

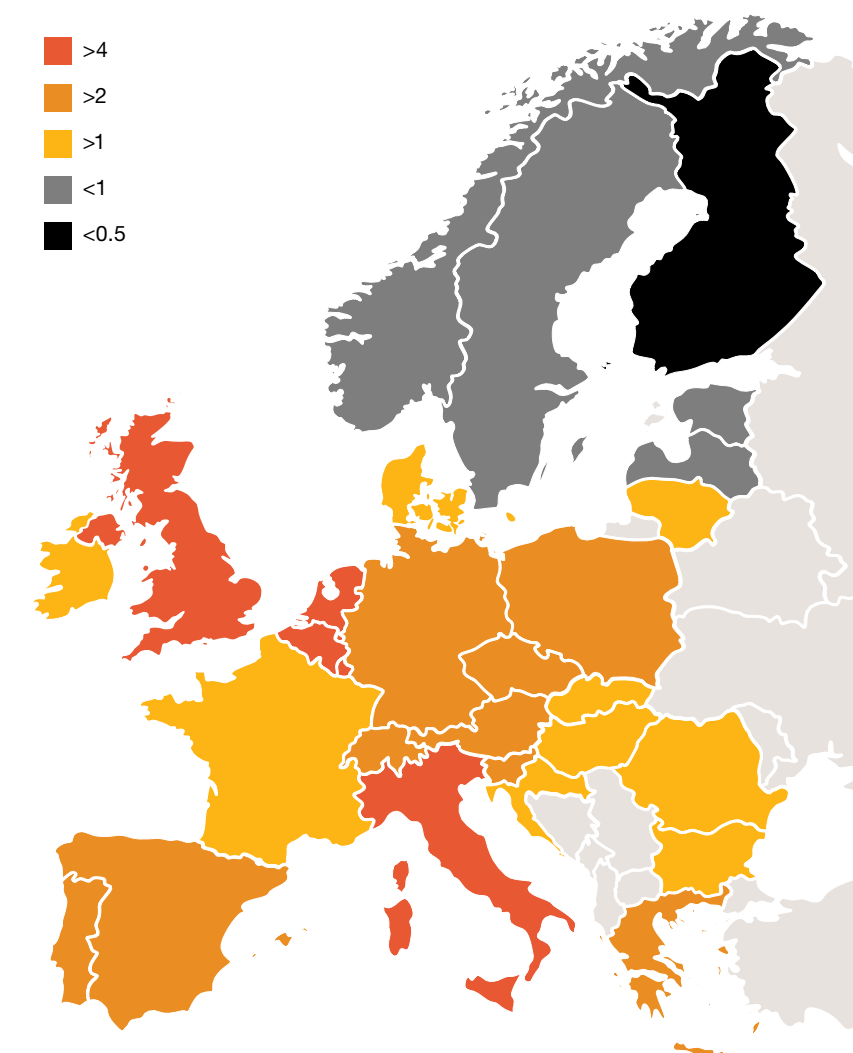


Figure 3: The ecological footprint of selected EU countries and Switzerland (number of planets needed to maintain consumption at current level). Source: adapted from PwC, 2019, The road to circularity, PwC (2019)

Switzerland and the planetary boundaries

Contrasting sharply to the EPI rankings above, the Global Footprint Network shows that Switzerland has a comparably high per capita ecological footprint, particularly in terms of material use, greenhouse gas emissions and biodiversity loss.³⁹

If everyone consumed the same amount as the average Swiss citizen, we would need more than three planets.

Some argue that in real terms, Switzerland's share in the global footprint is relatively small (0.2%). But, when considered in per capita terms, the environmental impacts of the average Swiss resident are comparatively high.⁴⁰

Due to Switzerland's high domestic demand, the country's ecological footprint adds significant pressure to the earth systems particularly related to climate change, biodiversity loss, bodies of water and over-fertilization of ecosystems. To better understand the scale to the problem, we can refer to the Swiss greenhouse gas footprint. To keep a global temperature rise under 2°C by 2100, the Swiss CO₂ footprint should be 0.6 tonnes of CO₂ per capita. It is currently 23 times

higher than the global per capita target value. Moreover, CO₂ also causes ocean acidification. Here the Swiss per capita impact on ocean acidification is 21 times higher than the global

per capita limit. We see similar trends for biodiversity loss which is 3.7 times higher and over-fertilization (eutrophication) by nitrogen, which is twice as high as the per capita limits set

under the planetary boundaries. The chart below from the Federal Office of the Environment provides a visual representation of the situation.⁴¹

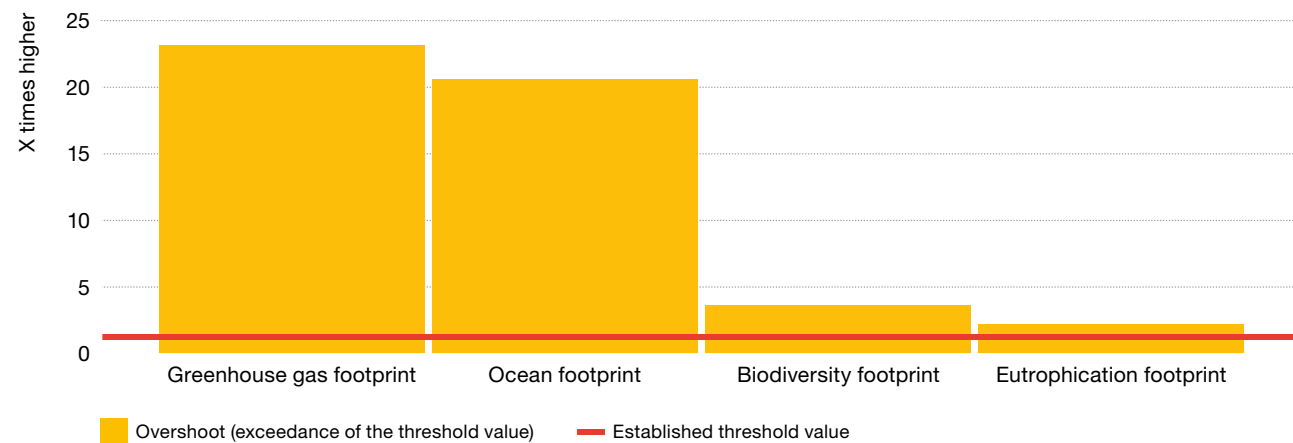


Figure 4: Switzerland and the planetary boundaries. Source: Dao et al. 2015, FOEN 2018a

One further characteristic of the Swiss environmental footprint is that many of the detrimental effects occur abroad. The environmental impact of Swiss domestic consumption has decreased, but this decrease is predominantly due to a shift in reliance on overseas production. Due to global supply chains and the high per capita income, many of the goods bought are imported from abroad. As a result, the environmental impacts of Swiss production and consumption have merely been ‘outsourced’ abroad [to regions like China (6%), Europe (60%) and the US (12%)⁴²], where they continue to increase due to rising demand.⁴³

These environmental trends are at odds with the need to remain within our planetary boundaries, especially regarding climate change. In order to meet the requirements for operating within these boundaries, i.e. within the safe operating space, Switzerland would need to reduce its natural resource consumption by two-thirds.⁴⁴

Lost value in Switzerland

In Switzerland, raw material consumption (RMC) per capita decreased by approximately 10% (to

below 17 tonnes) between 2000 and 2018.⁴⁵ Yet, Switzerland’s material footprint is still considerably higher than the average for EU countries of 14 tonnes per capita in 2017.⁴⁶ Waste contributes significantly to Switzerland’s material footprint, with construction waste being by far the largest waste category, generating above 80% of all waste. In Switzerland. The second largest waste category is municipal solid waste, followed by biowaste representing the third largest waste category.⁴⁷

In total, Switzerland produces 80 to 90 million tonnes of waste each year, with two-thirds (around 68%) of raw materials already in the economic cycle.⁴⁸ As shown below, recycling efforts and the circular potential vary from sector to sector:

- With a view to the construction sector, **75% of excavated materials as well as 70% of deconstruction materials**, which constitute valuable secondary materials, are recycled. But, a significant amount of deconstruction materials (over 5 million tonnes) is still currently sent to landfill or incinerated in waste incineration plants. In addition, the recycling quality and reuse of building

materials can be further optimised.⁴⁹

- Regarding municipal solid waste, Switzerland is one of the highest recyclers worldwide. Although the non-recyclable share of municipal **solid waste remained unchanged, the percentage of recycled waste is constantly increasing** (from 45% in 2000 to 53% in 2016). The recycling focus is on established materials like glass, PET, aluminium, paper and steel. More complex products comprising various different materials (e.g. electronic scrap, hazardous waste, slag or filter dust) are being increasingly collected separately. But, Swiss recyclers come off significantly worse when it comes to non-PET plastic: out of 780,000 tonnes of plastic waste each year, only 80,000 tonnes, around 10%, are recycled.⁵⁰
- A lot still needs to be done with regard to **biowaste**. While 1.3 million tonnes of biowaste are turned into recycled fertilisers, 4.2 million tonnes are incinerated each year. In addition, a substantial share of food that’s thrown away, more than 50%, is still edible.⁵¹ Food consumption in Switzerland generates 2.8 million tonnes of avoidable food waste per year at all stages of the food chain, both in Switzerland and abroad. Per

person and per year, CHF 600 go to waste. The environmental impact of food waste occurs: 38% in households, 14% in gastronomy, 8% in wholesale and retail, 27% in processing and 13% in agricultural production.

- Over 50,000 tonnes of **used clothing and textiles** are disposed of throughout Switzerland every year – that’s roughly 100 tonnes per day in Switzerland alone.⁵² Swiss people have an average of 118 items of clothing in their wardrobe, they buy 60 new ones every year and 40% of their clothes are never worn or are only worn 2-4 times.
- Switzerland is home to world-renowned **luxury watch and jewellery companies** and is the global leader in the gold refining market. Around half of the largest luxury watch brands are Swiss, and between 60% and 70% of the globally mined gold physically travels through Switzerland to be refined (~2,400 tonnes in 2017⁵³). Yet, the sector with its sourcing of raw materials and the rising supply of unrepairable low-quality fashion items and smart watches with relatively low life expectancies, has a bigger ecological and social impact than many might think.

But, despite all the recycling efforts and partial success, it’s important to mention that a sustainable circular economy involves recycling as a last resort – because even if all waste could and would be recycled in Switzerland, it would only cover one-fifth of the current material needs. So, in environmental terms it’s not the preferred approach, and attention in Switzerland should be drawn to other strategies like slowing and regenerating resource loops as well.

Regulatory trends in Switzerland

Going beyond closing loops
Switzerland may recycle more waste than its European neighbours (53% recycled municipal waste), but it’s also one of the largest consuming and waste producing nations in the world.⁵⁴ The amount of waste produced is increasing (in 2018, municipal waste per capita was 705

kg, nearly 100 kg more than in 1990), along with the consumption of natural resources.⁵⁵ This observation highlights the need for a circular strategy which goes beyond waste management and recycling to tackle the pressing environmental issues that we’re confronted with. This is why the regulatory environment has to evolve and go beyond a strategy that focuses on minimising the symptoms of a production and consumption model that’s flawed by conception.

Political and regulatory shifts

In 2016, a popular initiative on green economy suggested an ambitious constitutional goal that could have led to various adaptations of the regulatory framework. At that time, the political configuration wasn’t ready to adopt either such an ambitious strategy that aimed at keeping Switzerland’s ecological footprint within the boundaries of one planet by 2050, or the counterproposal developed by the Federal Council. Since then, the parliament has adopted some of the articles of the counterproposal (Art. 35 e, f, g, h), while others are being discussed at the time of writing (2020). Alongside policy developments at EU level, numerous interventions have been or are in the process of being discussed in parliament, dealing with most of the dimensions of the circular economy: from the traditional dimensions of closing the resource loops (material and thermic valorisation), to issues related to specific materials (sustainable management of plastics and action plan against food waste etc.), to provisions on slowing the resource loops (availability of spare parts and reparability index etc.), as well as broad circular economy strategies dealing with drivers and barriers for the transition towards CE.

While many of these interventions are still at the beginning of a rather long decision-making process, some initial results are interesting to note. Parliament recently agreed on an initiative entitled ‘Reinforcing the circular economy in Switzerland’,⁵⁶ leading to a legislative revision aimed at increasing the efficiency of re-

source use, supporting material valorisation and promoting sustainable consumption and circular economies. This initiative is a synthesis of seven individual initiatives on CE proposed a year ago by members of parliament from various political parties, based on propositions made in the counterproposal by the Federal Council to the green economy initiative mentioned above. Since this is a legislative initiative, its goals are expressed in broad and comparatively general terms. Yet, several proposed provisions are worth mentioning:

- The Confederation as well as cantons are required to **safeguard natural resources and increase the efficiency of resource use** in order to reduce environmental harm in Switzerland and abroad. The **government has to report** regularly to parliament on measures concerning the use of natural resources and to propose related quantitative targets.
- A **platform promoting CE in Switzerland** should be created by the Confederation, gathering and fostering collaboration with cantons, business associations as well as scientific and civil society organisations.
- Specific provisions should be developed regarding **packaging** (use of circular materials, avoidance of unnecessary packaging) and **material valorisation** (metals in waste, materials in construction waste, phosphorus in sewage sludge and other waste etc.).
- Other provisions are mentioned on energy recovery, packaging collection and collaboration with economic organisations.⁵⁷

In August 2020, the “Environment, Spatial Planning and Energy Committee” (ESPEC) of the Swiss National Council set up a sub-committee assigned to examine the different concerns of the initiative in detail and to prepare a preliminary draft for the plenary commission under consideration of affected industries.

The federal government and the public administration are also making promising steps: while answering a

2017 postulate⁵⁸ on fiscal measures promoting circular economies, the Federal Council examined over 50 options to tackle the potential of circular economy in Switzerland. In this report published in June 2020,⁵⁹ the Federal Council concludes that the most thorough way to promote the circular economy is through a well-coordinated bundle of measures on both the supply and demand sides. These include, for example, measures aimed at increasing the useful life of products. Three measures are being analysed in more detail: product declaration, extension of the warranty period including repair option and registration solutions to secure ownership. Implementation would require legislative adjustments in several areas of law. Other measures focus on the design and production of closed-loop products. This work will serve as a basis for a proposal for specific measures on resource preservation and circular economy which is expected by the end of 2022. Another positive signal was made in September 2020 whereby the counterproposal to the popular initiative for a sound climate (glacier initiative) integrates the objective of zero net emissions by 2050 as a new constitutional⁶⁰ article. This is an important signal to orient long-term strategy and redirect financial investments, which is very relevant promoting circular strategies in Switzerland.

Accelerating legislative options
These recent developments are steps in the right direction. In this regard, initial scientific results from the nationally funded LACE research project⁶¹ indicate that the principles integrated into Swiss environmental law are in line with the circular principles.⁶² The constitutional provisions are also setting a fruitful context for the circular economy.⁶³ Yet, these results also highlight the need to further integrate these principles and the underlying life cycle approach into all sectoral policies, among others, by translating them into directly applicable instruments in order to accelerate the transition.

The development of clear and ambitious targets⁶⁴ would be an effective tool to accelerate the transition. Targets would encourage a coordination between the different sectors towards a common systemic objective. What's more, it would allow monitoring and measurement of such goals while setting a clear signal for strategic decisions for companies in the longer term.

3.2 European Union

The international market and regulatory environment are constantly changing, requiring Swiss companies to adapt accordingly in order to maintain a competitive advantage. As the European Union is one of Switzerland's most important trading partners, accounting for 60% of its trade volume in 2018,⁶⁵ the imminent regulatory developments on circular economy in Europe are of particular relevance to Swiss businesses and regulators.

In December 2015, the European Commission adopted a package to support the EU's transition to a circular economy and as a result started to take the lead on the topic.⁶⁶ In March 2019, the Commission announced that the action plan has been completely executed with all 54 actions included in the 2015 plan having been delivered or being implemented.⁶⁷ Recently, in March 2020, the European Commission adopted a new Circular Economy Action Plan which builds on the circular economy actions implemented since 2015 and is one of the main blocks of Europe's agenda for sustainable growth, the European Green Deal.⁶⁸

The new Action Plan – containing legislative and non-legislative measures – provides initiatives throughout the entire life cycle of products, including product design, circular economy processes, sustainable consumption, and making sure that the resources used are kept in the EU economy for as long as possible.⁶⁹

The new Circular Economy Action presents measures to:⁷⁰

- Make sustainable products the norm in the EU.
- Empower consumers and public buyers.
- Focus on the sectors that use most resources and where the potential for circularity is high, like: electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients.
- Ensure less waste.
- Make circularity work for people, regions and cities.
- Lead global efforts on the circular economy.

As part of this legislative initiative and, where appropriate, through complementary legislative proposals, the Commission will consider establishing sustainability principles and other suitable ways to regulate the following aspects:⁷¹

- Improving product durability, reusability, upgradability and reparability, addressing the presence of hazardous chemicals in products, and increasing their energy and resource efficiency.
- Increasing recycled content in products, while ensuring their performance and safety.
- Enabling remanufacturing and high-quality recycling.
- Reducing carbon and environmental footprints.
- Restricting single-use and countering premature obsolescence.
- Introducing a ban on the destruction of unsold durable goods.
- Incentivising product-as-a-service or other models where producers keep the ownership of the product or the responsibility for its performance throughout its life cycle.
- Mobilising the potential of digitisation of product information, including solutions like digital passports, tagging and watermarks.

- Rewarding products based on their different sustainability performance, including by linking high performance levels to incentives.⁷²

As shown in figure 5, a significant number of European states are in the process of adopting a national resource efficiency or circular economy strategy. More precisely, out of 32 countries, 9 have adopted a dedicated circular economy strategy, action

plan or roadmap at various administrative levels. Eight of these countries, namely Belgium, Denmark, Finland, France, Italy, the Netherlands, Portugal and Slovenia, have adopted these at national level.⁷³ A further four countries have dedicated policies pertaining to resource efficiency as a national strategy – Austria, Finland, Germany and Ireland with a further three at sub-national levels. As the

European Circular Economy Roadmap is implemented, the number of further countries is expected to grow.

In the following, France, the Netherlands and Denmark will be presented as three EU frontrunner examples in pushing forward circular economy-related legislation to illustrate concrete measures.

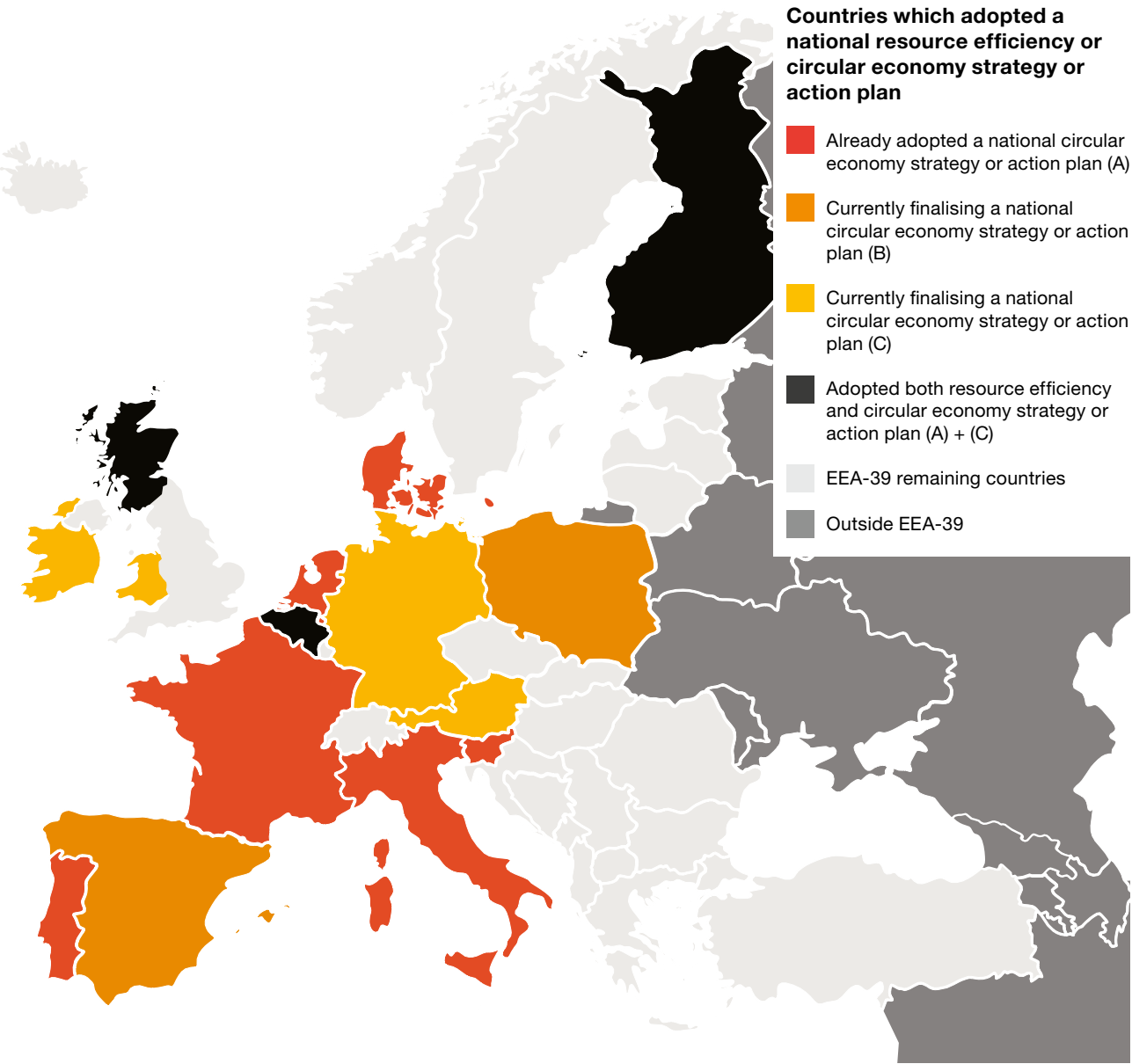


Figure 5: Overview of countries with national resource efficiency or circular economy strategies or action plans. Source: European Environmental Agency, 2018

3.2.1 France

After being the first country to ban supermarkets from tossing away or destroying unused food approaching its best-before date, France moved ahead in 2020 and adopted the ‘French act of law against waste and for a circular economy’.⁷⁴ The law sets out several concrete goals, including a 5% decrease in waste from economic activity and a 15% decrease in household trash per inhabitant by 2030. In addition, the law establishes the goal to recycle 100% of plastics by 2025 and ban single-use plastic packaging by 2040. All in all, it contains about 50 measures providing for:

- New **obligations** as the producer responsibility sectors have been extended and now include further product families like toys, sports and do-it-yourself equipment, building materials, cigarette butts and sanitary textiles.
- New **tools** to better control and sanction offences against the environment (greater power for mayors to combat littering and illegal dumping), to support companies in their eco-design initiatives (bonus/malus-type incentives) and to assist citizens in new consumption practices (repairability index, information on environment and health impacts of products, and harmonisation of info on sorting etc.).
- New **prohibitions** on single-use plastics and to fight the wasting of food and non-food unsold products.

Other recent legislative changes in favour of circular approaches include the promotion and availability of spare parts.⁷⁵ In 2015, the French government amended the French Consumer Code to require professional sellers to disclose all information regarding the availability of essential spare parts. The law states that a manufacturer or importer is required by law to make these requested spare parts available within a period of two months. In the same year, France made it a criminal offence for producers to design-in pre-planned obsolescence into their products. “Preplanned obsolescence

is defined as an industrial practice and economic model that sees goods of all types deliberately made to last for a short period of time.”⁷⁶ This law is one further means of campaigning for more durable and repairable products from both an environmental point of view and a consumer rights perspective.

3.2.2 Denmark

The circular economy features high on the Danish public agenda. The Danish government presented its circular economy strategy in 2018, coupled with an initial budget of EUR 16 million to accelerate the transition. The strategy comprises 15 initiatives with the following six areas of intervention:

1. Strengthen enterprises as a driving force for circular transition.
2. Support circular economy through data and digitisation.
3. Promote circular economy through design.
4. Change consumption patterns through circular economy.
5. Create a proper functioning market for waste and recycled raw materials.
6. Get more value out of buildings and biomass.⁷⁷

The Danish government has estimated that the transition towards a circular economy will “result in up to DKK 45 billion increase in GDP and a reduction in CO₂ emissions of between 3% and 7%.”⁷⁸

There are two elements of the Danish circular strategy that are worth mentioning. The first relates to their national sharing economy strategy which was launched in October 2017. The second is their broad stakeholder engagement approach.

Their sharing economy strategy contains 22 initiatives which aim to make it easier to for citizens and sharing economy businesses to operate. Incentives include lower taxes on income generated from renting out accommodation or cars, provided that the transaction is done through a

platform which reports its revenues to the Danish tax authorities.

Similar to Finland, the Danish stakeholder engagement strategy ranges from public consultation efforts to sectoral partnerships. Public consultations included a public Internet portal to collect ideas and recommendations from the public. These inputs were also reflected in participatory workshops to identify a vision, targets and recommendations for circular economy.

An Advisory Board for Circular Economy was set up and backed by four industry associations – the Confederation of Danish Industry, the Danish Chamber of Commerce, the Danish Construction Association and the Danish Agriculture and Food Council – to commit and plan ways to mutually drive forward the circular economy and resource efficiency agenda. The business community in these four sectors has jointly committed to “increasing resource productivity by 40% from 2014 to 2030, and increasing recycling in the same period from 58% to 80%.”⁷⁹

3.2.3 The Netherlands

As another frontrunner in the circular economy, the Netherlands aims to have achieved a fully circular economy by 2050. The Dutch government’s vision on the circular economy is given in the ‘Nederland Circulair in 2050’ (Circular Economy Programme for the Netherlands, 2050) together with the (interim) target of 50% less use of primary raw materials (mineral, fossil and metal) by 2030.

Among others, the Dutch government wants to use legislative measures to enhance the transition to a circular economy. After having identified areas where legislation needs to be changed in order to remove regulatory obstacles to green growth, the Dutch Circular Economy Implementation Programme 2019-2023 is now investigating necessary legislative amendments.⁸⁰

A selection of key actions for legis-

lation and regulations for waste is shown below.⁸¹

- The Waste Review Taskforce analyses obstacles in waste legislation and regulations and their implementation (granting permits, compliance assurance and enforcement), and suggests solutions.
- Exploring the possibility of an incineration ban for recyclable waste and exploring a ban on destroying or incinerating recyclable consumer goods.
- To determine whether or not a material or raw material is waste, a non-binding declaratory opinion can be formulated. Currently, such non-binding declaratory opinions are being formulated on whether struvite from sewage sludge and beet tips are waste or not.
- With respect to the Locations and Waste Substances (Dumping Ban) Decree, an assessment is being made as to whether the three-year period for storing waste can be extended in the event that more circular processing techniques become available.
- To improve the separate collection of waste, the legal framework for waste collection in the office, shop and service sectors will be looked at critically.

In addition, the implementation programme stipulates a ‘Green Deal for Circular Procurement 2.0’ as circular procurement is considered an important tool for accelerating the transition to a circular economy. So, the national government will use its own purchasing power to encourage the circular transition, with the aim of achieving savings of 1 million tonnes in 2021 in all governmental authorities.⁸² This procurement approach integrates the material consideration at its end-of-life stages in an attempt to retain its value. According to the circular procurement guidelines, the material should be bought and utilised in such a way that it’s possible to reuse or repurpose the materials to retain their value for another cycle. The government is setting an example with Rijkswaterstaat by building a viaduct from reusable components

which are sourced from old recycled military equipment.

In conclusion, the examples above illustrate that the topic of circular economy has long since made it onto the agenda of European politics and regulators. The EU and member states already set up ambitious and concrete goals with respect to a circular economy and are taking action on a legislative level. From a regulatory perspective there are many ways to enhance and foster circularity, ranging from incentivising waste avoidance right from the start, to making waste production more costly. With the former being a preferred strategy, manufacturers should be incentivised to redesign their products accordingly. As manufacturers’ savings due to lower recycling and disposal costs are low in comparison with their often costly investment in redesign, as a result incentives may also include subsidies for investments in redesign.⁸³ Undeniably, Switzerland is making steps in the right direction, but is lagging far behind when it comes to setting ambitious, clear circular and resource-based goals as well as encouraging smart circular economy legislation, for example. The sooner it catches up, the better.



4. The circular opportunity: Swiss sector deep-dives

Echoing European findings, the circular economy opportunity represents a multi-billion-franc opportunity for Swiss businesses as well as promising social and environmental benefits.⁸⁴

In 2019, the Swiss market for sustainable investments (SI) experienced double-digit growth of 62% to CHF 1,163.3 billion.⁸⁵ Coupled with growing international opportunities like the European Green Deal Investment Plan (EGDIP), which plans to mobilise at least EUR 1 trillion in sustainable investments over the next decade,⁸⁶ we identified a significant opportunity for circular Swiss businesses to capitalise on these incoming funding opportunities.

With regard to recovered resource value, Switzerland currently recovers only 13% of its waste,⁸⁷ with the remainder coming from domestic extraction and imports in 2018.⁸⁸ According to the Swiss Federal Statistics Office, if all waste could be recovered, this statistic could increase to 20% of current material needs. This suggests that the overall demand needs to be targeted with slowing resource loop strategies. Nevertheless, in monetary terms the recovered resource value still accounts for several million francs of recovered value in Switzerland.

In addition, some businesses consider Switzerland's size and demographics as favourable for piloting new sustainable innovations. For example, the 'H2 Mobility Switzerland Association' has invested heavily in the world's largest fleet of hydrogen-electric commercial vehicles and is building the required infrastructure to start operations by 2023.⁸⁹ In light of Switzerland's innovation potential, a focus on circular solutions could provide access to new means of value creation and with this new markets.

The circular opportunity has the potential to benefit society as a whole. Based on calculations for other European countries, it can be roughly estimated that a rise in circular jobs could create around 100,000 jobs⁹⁰ in Switzerland. Further indirect social benefits are expected as the regenerative loops promote reduced pollution, and both more locally sourced and less toxic products will lead to improved health and reduced health-care costs.⁹¹

And last but certainly not least, circular economy could play a key role in paving the way to a greener future, enabling Switzerland to contribute to its sustainability commitments (Agenda 2030, Paris Agreement, etc.) Through reuse, recycling and reduction of materials, waste is minimised along with its disposal costs and associated damage and opportunity costs for the affected landfill sites. Besides reducing pollution and addressing climate change, Switzerland can do its part to foster new forms of consumption (especially related to nutrition, mobility and housing) to work towards operating within the planetary boundaries, sustain the current biodiversity and soil health, and gain independence from the growing resource scarcity.

Circular opportunities will enable Swiss businesses and society to balance current and future risks associated with the linear economy.⁹² The rethinking and redesign of current linear business models to circular ones will inevitably fuel a new wave of sustainable innovations which capitalise on advantages (e.g. derived from shorter supply chains due to a focus on more locally sourced materials, products, ingredients and a reduction in the amount of materials used) but also a significant decrease in risks (e.g. less dependency on scarce resource supply and a de-

creased risk of losing customers due to their sustainability preferences). Circular solutions will enable Swiss businesses and stakeholders to contribute to an economically, socially and environmentally resilient future.

4.1 Food sector

Tackling food waste through circularity in the Swiss food sector

Structural waste in the Swiss food sector is a complex matter. In line with WWF priorities and with respect to opportunities relating the Swiss contribution to Sustainable Development Goal (SDG) 12.3,⁹³ we're focusing on the organic cycles and avoidable⁹⁴ food waste. SDG 12.3 sets the goal of halving per capita global food waste at the retail and consumer levels and reducing food losses along production and supply chains by 2030. Research at ETH Zurich⁹⁵ and a recent study commissioned by the Federal Office of the Environment⁹⁶ shed a light on the opportunities and problems of the sector. While the absolute volumes of avoidable food waste along the value chains are appalling, at most⁹⁷ stages of the supply chain only a small fraction of it seems to end up in incineration plants, which means the end of life in the Swiss waste disposal system. So, is there a problem at all?

Unfortunately, but not surprisingly, the environmental impact⁹⁸ of food waste increases along the different steps of the supply chain, because more resources are needed. Be it for processing, storing, packaging, transport or otherwise.



25%

of the nutrition-related environmental impact is caused by avoidable food waste.

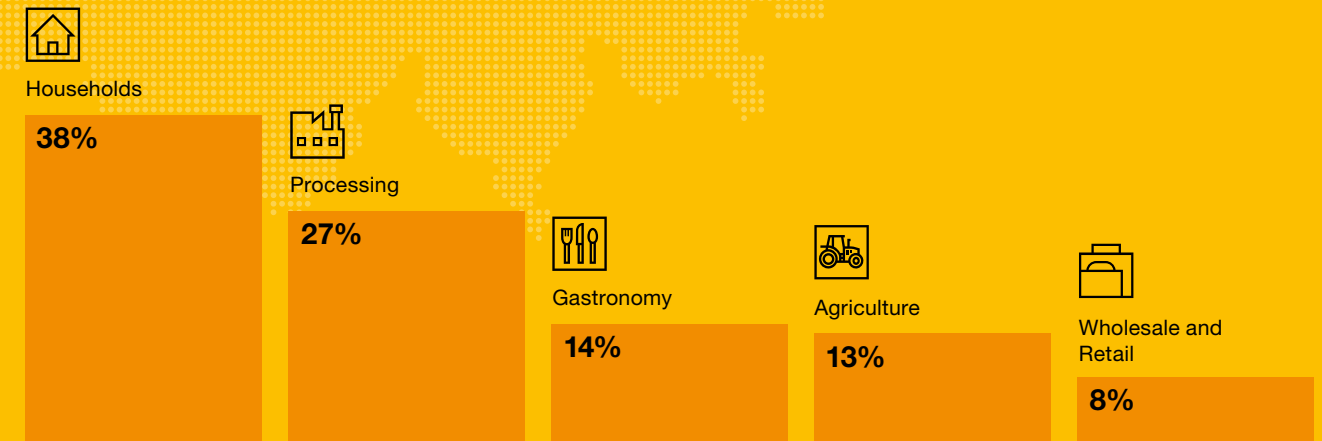


Figure 6: The environmental impact of food waste occurs: 38% in households, 27% in processing, 14% in gastronomy, 13% in agricultural production and 8% in wholesale and retail. Source: Beretta & Hellweg, 2019

To truly understand the scale of the food waste problem in Switzerland, one needs to look at the statistics. An estimated 25% of Switzerland's nutrition-related environmental impact is caused by avoidable food waste. This means that an area equivalent to half of all the agricultural land in Switzerland is used to grow food that ends up being wasted at some point along the value chain. Overall, food consumption in Switzerland generates 2.8 million tonnes of avoidable food waste per

year at all stages of the food chain, both in Switzerland and abroad.

The environmental impact of food waste occurs: 38% in households, 27% in processing, 14% in gastronomy, 13% in agricultural production and 8% in wholesale and retail.⁹⁹

The environmental impact is only one side of the coin. Although financial loss in food supply chains has not been studied in the same depth as

the environmental impact, it should not be underestimated. In agricultural production, CHF 0.6 billion go to waste every year. There is a lack of data for the processing industry. Retail trade loses an estimated CHF 0.5 billion and the gastronomy sector around CHF 1 billion. Last but not least, households let go CHF 5 billion go to waste. That's equivalent to CHF 600 thrown out per person per year.

600 CHF
per person thrown
away every year

which amounts to
2.8 Million tonnes of
foodwaste annually

and wasting
50%
of Switzerland's agricultural
land



Figure 7: An estimated 25% of Switzerland's nutrition-related environmental impact is caused by avoidable food waste. This means that an area equivalent to half of all the agricultural land in Switzerland is used to grow food that ends up being wasted at some point along the value chain. Overall, food consumption in Switzerland generates 2.8 million tonnes of avoidable food waste per year at all stages of the food chain, both in Switzerland and abroad. That's equivalent to CHF 600 wasted per person per year. Source: Beretta & Hellweg, 2019





“The promotion of the circular economy is a strategic priority for Migros. We want to organise our business activities in such a way that our consumption of resources is within the planetary limits. We are questioning linear value chains and looking for circular solutions. In doing so, we focus on the needs of our customers. In the future, we want to focus even more resources on this topic”.

Thomas Paroubek, Head of Sustainability and Quality, Migros-Genossenschafts-Bund

Benefits of circularity in the food sector

Circularity is nothing new in the food sector. Especially in production and processing, food waste can be repurposed and used as organic feedstock and animal feed. This is why at these stages of the supply chain, only a small portion of food waste is being incinerated. Yet, higher-value recov-

ery only totals up to 12% of environmental credits.¹⁰⁰ So, to reach SDG 12.3,¹⁰¹ the efforts for circularity in the food sector have to be amplified at the beginning of the chain. In addition, there is a real need for new business models at the end of pipe that aim to avoid waste.

And last but not least, food waste is not only an ecological problem, it's closely linked to economic loss at all stages of the supply chain, adding up to more than CHF 7 billion.¹⁰² This figure does not take into consideration the currently low-priced side-streams in the food processing sector with a huge potential for product innovation and upscaling, as experts point out.¹⁰³

A lot of actors can see this potential and are pioneering new tools, initiatives and investing in resources to push for more circularity in the sector.

Circular resource strategies best suited to the sector

The food sector is a very diverse sector, so the opportunities for circularity are wide ranging. It's of no surprise that the Association of the Swiss Food Industry (FIAL) emphasises the continuous interest in innovation in

“The food sector has always had a fundamental interest in processing the by-products of industrial processing primarily as food and making them available secondarily as animal feed. This keeps the raw materials in circulation. Utilisation of the by-products is relevant and mandatory for sustainability as well as economic considerations. This attitude was and is always relevant and it is worthwhile to reassess this question again and again to find even better solutions.”

Dr Lorenz Hirt, Managing Director FIAL

this sector.

Circular resource strategies pretty much depend on what happens in the value chain. At the beginning of the cycle (e.g. in production and processing) loops can be closed even further (e.g. by industry symbiosis) and narrowed (e.g. by producing less

resource intensive products). New approaches for regenerative agriculture are emerging, which means that the approach of regenerative resource loops is also applicable.

At the end of the cycle (retail, gastronomy and households), loops can still be slowed, e.g. by redistributing food that would otherwise go to waste, by avoiding promotions and package sizes that lead to food waste in households or by linking producers and consumers, and by educating consumers regarding storage, shelf lives and recipes for leftover food.

“Circular economy is nothing new. Nature shows us how it can be done - we simply have to revive this knowledge. It is our job to consider and design-in the reuse and recycling of all materials at the beginning of the product development process and ensure a holistic, resource-saving and closed-loop cycle.”

Urs Riedener, CEO, Emmi



Innovation cases

Closing loops at the beginning of the cycle – from bean to tea

As mentioned by experts, in the producing industry a lot of value is lost when by-products are simply used as organic feed or biofuels. A lot of these by-products could not only be reused but also upcycled, as examples show.

- **Chocolats Halba¹⁰⁴/Sunray** sources organic and Fairtrade cocoa beans directly. The beans are roasted and the nibs are ground in Switzerland. One tonne of processed cocoa beans generates around 130 kg of cocoa shells. The shells with their nutritious ingredients like theobromine and their distinct aroma are predestined for

further use. Industrial symbiosis made it possible to upscale to high-quality organic tea.

Narrowing loops at the beginning of the cycle – producing more with less

Narrowing the loops is an important strategy for reducing the environmental impact of food production and ultimately also of food waste. The sheer amount of fresh produce that ends up wasted highlights the importance of this category. As transportation adds to the general challenge of keeping fruit and vegetables fresh, innovative production methods can contribute to reducing the direct environmental impact of production and also help to avoid food losses along the supply chain.

- **Growcer¹⁰⁵** is a technology company that enables efficient vertical farming. Production in automated farms needs significantly less water and no synthetic pesticides. According to the company, the shelf life of their products is up to three times longer and yields can be doubled under optimised growing conditions. By enabling production in relatively small places (even urban areas), the need for transportation can be minimised. Using renewables decreases the carbon emissions further. The farms are based on a franchise model and serviced to the franchisees.

Slowing the loops at the end of cycle – measuring and avoiding food waste

As can be seen, the impact of the gastronomy and retail sectors is quite substantial. Both are still struggling to reduce cost and resource efficiencies. Two innovations are highlighted below.

- **KITRO¹⁰⁶** strives to help commercial kitchens detect potential for cost and resource efficiencies. Customers get access to an automated solution to measure and mitigate food waste. Long-term data collection helps to improve operational practices.
- **Too good to go¹⁰⁷** is a company specialised in marketing leftovers. The app has become the world's largest B2C marketplace for surplus food. Participating businesses like bakeries, supermarkets,

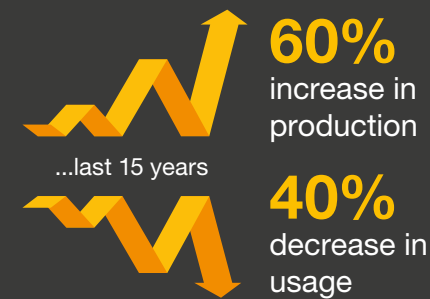
hotels and restaurants put their left-over food in 'magic bags' and post their surpluses. Consumers see the offers in their neighbourhood online and can take deliberate steps to save food.

Key takeaways

- Companies and countries should have a unified approach to monitoring and reporting food waste.
- Product and process design needs to take food waste into account and design-out food waste.
- Enable and support innovation to take upstream and downstream waste into account (e.g. via industrial symbiosis, redistributing food that would otherwise go to waste or avoiding package sizes and promotions that lead to food waste in households, or considering regenerative methods for agriculture in the production of food).
- Educate and support consumers to make responsible consumption decisions.
- Enable and support multi-stakeholder campaigns such as 'Save food, fight Waste'.¹⁰⁸

4.2 Textile Sector

Circularity in the textile sector: problems and opportunities



The last few decades have shown a tremendous increase in the demand for textile fibres, where clothing makes up the biggest part. According to the Ellen MacArthur Foundation, global fibre consumption is expected to reach between 130 and 145 million metric tonnes by 2025. On top of that, the textile industry is described

as the second most polluting industry in the world.¹⁰⁹ From immense water consumption and chemical use in growing and producing raw materials, huge energy demands in processes, pollution of soil and water, to uncontrollable amounts of waste, the textile industry is far from being sustainable, let alone circular.

Figure 8: Clothing represents more than 60% of the total textiles used, and in the last 15 years clothing production has approximately doubled, while clothing use has declined by almost 40%. Source: EMF, 2017

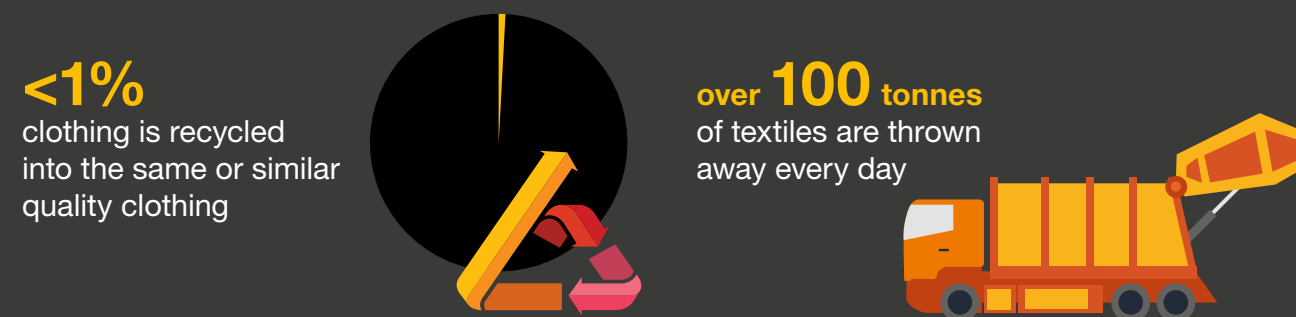


Figure 9: Recycling of clothing into the same or similar quality applications is less than 1%. Source: EMF, 2017

Figure 10: What's more, over 50,000 tonnes of used clothing and textiles are disposed of throughout Switzerland every year – that's more than 100 tonnes per day in Switzerland alone. Source: Texaid; www.fashionrevolution.ch

Clothing represents more than 60% of the total textiles used, and in the last 15 years clothing production has approximately doubled, while clothing use has declined by almost 40%.¹¹⁰ Both developments are mainly due to the 'fast fashion' phenomenon, with quicker turnaround of new styles, an increased number of collections offered per year and, often, lower prices. These trends are compounded by the fact that less than 1% of new

clothing is produced by recycled materials, representing a multi-billion franc loss in materials every year.¹¹¹

We see similar trends in Switzerland, where people have an average of 118 items of clothing in their wardrobe, they buy 60 new ones every year and 40% of their clothes are never worn or are only worn 2-4 times.¹¹² What's more, over 50,000 tonnes of used clothing and textiles are disposed of

throughout Switzerland every year – that's more than 100 tonnes per day in Switzerland alone.¹¹³

On a global level, it's estimated that every second, the equivalent of one waste disposal truck of textiles goes to landfill or is burned. If nothing changes, by 2050 the fashion industry will use up a quarter of the world's carbon budget.¹¹⁴



The current system for producing, distributing and using clothing operates in an almost completely linear way. Large amounts of non-renewable resources are extracted to produce clothes that are often only used for a short period, after which the materials are largely lost to landfill or incineration. It's estimated that more

than half of fast fashion produced is disposed of in under a year.¹¹⁵ This linear system leaves economic opportunities untapped, puts pressure on resources, pollutes and degrades the natural environment and its ecosystems, and creates significant negative societal impacts at local, regional and global levels.

Figure 11: For instance, Swiss people have an average of 118 items of clothing in their wardrobe, they buy 60 new ones every year and 40% of their clothes are never worn or are only worn 2-4 times. What's more, over 50,000 tonnes of used clothing and textiles are disposed of throughout Switzerland every year. Source: Texaid



The textile industry creates 5-10% of global CO₂ emissions. At the current rate this could increase to 26% by 2050.

Figure 12: On a global level, it is estimated that every second, the equivalent of one waste disposal truck of textiles goes to landfill or is burned. If nothing changes, by 2050 the fashion industry will use up a quarter of the world's carbon budget. Source: UNEP, 2020

Benefits of circularity in the textile industry

A circular textiles economy should be restorative and regenerative by design and provide benefits for business, society and the environment. In such a system, clothes, textiles and fibres are kept at their highest value during use and re-enter the economy after use, never ending up as waste.

The transformation towards a circular textile industry requires fundamental changes throughout the entire life cycle of textile products, from sustainable raw materials and more efficient processes, to design

changes in upstream processes in order to ensure the longevity, recyclability and reparability of clothes.

According to numerous industry experts, the vision for a new textiles economy is built on three main categories:

- **New business models that increase clothing use** (e.g. services that satisfy users' needs without having to own physical products).
- **Safe and renewable inputs used efficiently** (sufficiency-based approaches as solutions that actively reduce consumption and production).

- **Solutions to keep raw materials in the cycle** (eliminate the concept of waste and by turning waste streams into useful and valuable inputs for other processes).

By moving to a circular system, the industry can unlock a USD 560 billion economic opportunity according to estimates of the Ellen MacArthur Foundation.¹¹⁶ Realising this opportunity requires new business models and collaboration across the value chain in order to keep safe materials in use.



Circular resource strategies best suited to the sector



Innovation cases

Slowing resource loops – new business models that increase clothing use and avoid unnecessary production and consumption.

This will be key to making sure clothing is durable not disposable, and durability needs to become more attractive to businesses and consumers in order to slow the resource loops. Designing and producing clothes of higher quality and providing access to them via new business models would help shift the perception of clothing from a disposable item to a durable product. Such business models emphasise access over ownership to prolong the product use phase. As a result, retailers would be required to shift away from mere sales of goods towards service-based business models. This may, for instance, include renting of garments to consumers or leasing services for which consumers pay a monthly fee in exchange for access to a garment.¹¹⁷ In addition, repair and reuse concepts need to become more prominent, e.g. by offering repair kits and services as well as reselling refurbished used products. There are several small and big companies out there that already follow such business models. Brands like Patagonia or Filippa K are reselling used products, Nudie Jeans and multiple other players are offering free repair services, and companies like small Swiss startup Sharealook are promoting the concept of sharing garments. Also, leasing and pre-prescription models (e.g. Mud Jeans) are becoming more popular and the first actors are offering a renting instead of owning model (e.g. Swiss shoe manufacturer On with Cyclon - the shoe you'll never own).

Narrowing and regenerating resource loops – safe and renewable inputs used efficiently

This may, for example, require a shift away from using mixed fibres (e.g. polycotton) towards predominant use of mono-fibres in garments (e.g. pure cotton). The use of harmful chemicals (i.e. persistent, bio-accumulative, endocrine-disrupting or carcinogenic substances) must be avoided at all times. In addition, the use of recycled fibres needs to be increased substantially. In the manufacturing phase, innovative production techniques need to be fostered by incorporating means of zero-waste techniques (e.g. using off-cuts directly at the production facility and closed-loop chemical cycles).

“H&M’s ambition is to become fully circular and climate positive by 2040. Here in Switzerland, we believe in circularity as we drive activations like the H&M Member Swap event where H&M Members can swap garments and prolong the life of a dress or a shirt.”

Our Conscious Exclusive collection AW20 will showcase the natural fibre AGRALoop TM which is made out of food-crop waste, like leftovers from oilseed hemp. The AGRALoop TM Hemp Biofibre TM is a 2018 Global Change Award winner – the accelerator program from our H&M Foundation which has the aim to speed up the process of finding, supporting and scaling up disruptive early stage innovations that can make the entire fashion industry circular.”

Minna Carlberg, H&M Country Manager Switzerland

There’s an increasing number of fibre and fabric producers who make narrowing and regenerating resource loops an important part of their business model (e.g. Austrian fibre producer, Lenzing,¹¹⁸ has implemented closed-loop chemical cycles in its Tencel Lyocell production process). What’s more, multiple brands are focusing on closing the biological cycle by ensuring safe and renewable inputs in their products (e.g. cradle-to-cradle certified raw materials). For instance, Swiss bag and apparel producer Freitag¹¹⁹, underwear and sleepwear brand Calida¹²⁰ and even big fashion brands like C&A¹²¹ have focused on creating biodegradable clothing to minimise waste.

Closing resource loops – solutions to keep raw materials in the cycle

In downstream processes, end-of-use measures like recycling, upcycling and reuse are viewed as prominent approaches which can close material loops and retain the material quality of textiles for as long as possible. This includes the development and large-scale adoption of innovative sorting and recycling technologies to separate fibres without reducing their inherent material quality. It also incorporates the design and development of products that facilitate recycling and reuse after the product’s end-of-life.

Swiss fabric manufacturer Stotz,¹²² for example, is offering a 100% recycled cotton fabric from post-production off-cuts, and the industry alliance Wear2Wear¹²³ is one of the frontrunners in creating new clothes made from recycled textiles. In addition, the Dutch startup UpSet Textiles¹²⁴ aims at creating fabrics made from 100% recycled materials and an increasing number of apparel brands are considering circularity in the design and production phase to facilitate reuse and recycling at the product’s end-of-life (e.g. mono-fibre garments by Swiss Startup Muntagnard¹²⁵).

“Ever since we cut the first bag out of a discarded truck tarp, it has been cycles that have driven us at FREITAG. We have gone one step further in the development of our F-ABRIC textiles: our fabrics and garments have been developed from scratch in a way that they are – along with their shirt buttons, labels and threads – fully biodegradable on a compost heap. This was not exactly a walk in the park – it took us 5 years to get there – but if you want to deliver future-proof solutions nowadays, you have to close the cycle and put the end of the product life cycle at the very beginning of the development process.”

Daniel Freitag, Co-Founder FREITAG

Key takeaways

- Slowing the loop by allowing clothing and other outdoor gear to last and be used for a longer time thereby increasing its perceived value and reducing overconsumption.
- Closing the loop by designing for circularity to facilitate recycling and eliminate waste after end-of-use.
- Narrowing the resource loops by decreasing ‘new’ material and resource use per product.

4.3 The role of circular economy in the financial industry

Not only will the shift to a circular economy affect the financial industry's retail and institutional clients and as a result the financial industry itself, **the financial industry has a key role to play** in the transition to a circular economy. In contrast to the manufacturing industries and the ones presented in this white paper, the financial sector doesn't produce any goods in the 'traditional' sense. But, as an 'enabling industry' it lays the financial foundations for the transition to a circular economy, allowing other industries to evolve accordingly. This is also underscored by the fact that the recently established EU taxonomy carries the 'transition to a circular economy' as one of the six objectives of sustainable economic activities. Accordingly, an economic activity can be deemed sustainable if it contributes substantially to the transition to a circular economy – including waste prevention, reuse and recycling – without significantly harming any of the other five environmental objectives and while complying with minimum safeguards. As the EU taxonomy as well as the EU Sustainable Finance Disclosure Regulation with its Principal Adverse Impacts indicators¹²⁸ have a great impact on the financial industry, this turns circular economy into an increasingly important topic from a financial point of view too.¹²⁷

“Finally, the key actors and general population are waking up to the key role that capital plays in capitalism - also in regard to sustainable development. By definition, the unsustainable finance system of today will not prevail.”

Prof. Dr. Falko Paetzold, Managing Director Center for Sustainable Finance & Private Wealth at the University of Zurich

As the transition to a circular economy – presenting a multi-trillion-dollar economic opportunity in Europe alone¹²⁸ – needs to be financed, it holds **great opportunities to be tapped into for the financial sector. Circular investments** which facilitate access to finance for circular economy businesses and projects are financial institutions' most powerful tool to employ.¹²⁹

1. By lending to innovative projects with a circular resource strategy (e.g. those that systematically redesign products to cut out waste, close material loops and extend the life cycle of assets), 'circular opportunities' can be exploited. Circular financing can take into account the specific needs of the borrower, which may vary according to a project's size, maturity, client type or the actual position in the value chain etc. It can also take the form of **circular bonds**, i.e. sustainable bonds dedicated to creating a more circular economy with the proceeds being allocated to circular economy companies and projects.
2. On the other hand, financial institutions can also avoid investing in companies that aren't sufficiently prepared for the transition or find themselves in a declining sector, thereby minimising 'linear risks'. But, financial services firms could and should also consider engaging with companies and inspire them to make the transition.

To support businesses seeking for and contributing to circular solutions, financial services can offer **complementary services** as well, like advisory (e.g. on project structuring and financial viability) and platforms for networking, connecting relevant stakeholders and sharing best practices.

However, 'circular investing' is a double-edged sword for investors, and – at the current stage – there are still hurdles to overcome as both businesses and the financial sector need to develop a mutual understanding on two contrary views:

1. From a business point of view, the financial sector often fails to assess the benefits of circular approaches while overestimating the risks inherent to circular business models.
2. In the financial industry's view, circular economy projects which go hand in hand with the application of new business models and innovative technologies bear a significant risk and as a result are often unbankable.

As a result, **risk-related topics** are particularly challenging in the context of **financing the circular economy**, including proper risk perception and assessment by different stakeholders.¹³⁰ So, it's important to realise that while money is a potential enabler of the transition to a circular economy, a genuine mind shift in the financial industry is still required in order to support circular economy effectively. If financial service providers continue to adopt a linear perspective on the economy, this might **even result in a disadvantage for circular projects looking for finance options**. For this reason, the EIB claims that “the financial sector must improve the availability of financing and revisit its approach to appraising linear and circular risks” as the investment capital is vital to change business practices.¹³¹ And although the risks, uncertainties and lack of experience related to the new business paradigm imply enormous challenges for the financial industry, it also holds the opportunity to create and offer new financial products that meet the growing market demand.

“More needs to be done to engage the amounts needed to support circular economy and to change the mindset of financiers, engineers and risk managers about tomorrow's challenges.”

Werner Hoyer, President European Investment Bank

Benefits of circularity in the Swiss financial industry

As PwC and WWF recently pointed out in their joint report 'Leading the way to a green and resilient economy – A Swiss quality approach to sustainable finance' safeguarding humanity's capacity to sustain life on Earth can only be achieved if climate change and biodiversity loss are addressed effectively and simultaneously by transforming the economic system.¹³² Circular economy is a strategic response for financial services firms to climate change and helps identify and improve the understanding of relevant risks.¹³³ As the financial sector is at the heart of the economic system, it's in a privileged position to encourage, demand and create the necessary incentives for the transformation of the real economy from a linear to a circular one.

Ultimately, a circular economy aims at healthy nature and ecosystems which are key for human wellbeing and development. Aligning financial flows such that by 2050 global warming does not exceed 1.5°C and biodiversity is fully recovered seems imperative for sustaining life on Earth. Additionally, realising the overarching goal by fostering circularity is associated with a series of economic and social benefits:¹³⁴

- Opening up of new market opportunities and creation of jobs.
- Reduction of the financial risks and strengthening of the resilience of financial markets and the economy as a whole.
- Ensuring a level playing field by granting market access and strengthening the competitiveness of the Swiss financial sector.
- Investor/consumer protection.
- Respect of and alignment with consumer preferences.

Circular resource strategies suited to the sector

Generally, as the financial industry assumes the role of an 'enabling industry', it can support companies and projects with all kinds of resource-loop strategies and circular business models as the following examples show:

- Through investments in cleantech, financial service providers contribute to narrowing resource loops.
- Through investments in new recycling technologies, financial service providers contribute to closing resource loops.
- Through investments in regenerative organic agriculture, financial service providers contribute to regenerating resource loops.
- Through investments in new business models with a focus on product longevity like sharing or platforms for second-hand items, financial service providers contribute to slowing resource loops.

“Circularity makes business models more resilient and fit for the future. It is therefore an important criteria when assessing ESG related risks and opportunities of investee companies.”

Andreas Knörzer, Vice Chairman Vontobel Asset Management



Innovation cases

A well-known example of circular investing and one of the Swiss frontrunners in this area is the asset manager DECALIA, which launched the first equity fund dedicated to the circular economy in 2018. The DECALIA Circular Economy Fund builds on eight proprietary sectors: the sharing economy and platform-as-a-service, prevention and diagnostics, nutrition, renewable energy and smart grid, waste and recycling, water management, smart and green materials, and Industry 4.0. As can be

seen, the investment universe is not limited to a specific resource strategy but comprises several different ones.¹³⁵

In general, the investment universe related to circular economy is changing and expanding as circular economy principles are increasingly integrated by companies and new players enter the market.¹³⁶ Other cases show that the financial services industry can also contribute to economic circularity in ways other than investing, especially through knowledge building and sharing:

- Dutch banks ABN AMRO, ING and Rabobank, for example, are eager to support circular economy businesses and collaborate to share knowledge on this topic. In 2018, they launched joint circular economy finance guidelines, “inspired by the ambition to create a common framework for financing the circular economy worldwide”.¹³⁷
- BNP Paribas has established 'Leasing Solutions' encouraging a transition to the usage economy through offering (i) long-term leasing, (ii) access to equipment that uses less or cleaner energy, or (iii) contracts reflecting how equipment is actually used.¹³⁸
- In light of the European Commission's new Circular Economy Action Plan, the European Investment Bank (EIB) is also supporting the transition to a circular economy and recently published a Circular Economy Guide containing background information on the circular economy and EIB's support measures.¹³⁹

The role of regulators

It's important for regulators to support the financial industry on its way to circular finance. In order to unlock their potential as enablers, regulators and financial service providers must work together on the following essential points:¹⁴⁰

- Developing a common understanding of the circular economy including the challenges and opportunities among different stakeholders.
- Creating awareness about circular solutions and making them a priority.

- Enhancing transparency by making circular economy-related disclosure mandatory, facilitating and harmonising due diligence and reporting accordingly, as well as standardising definitions and metrics for circular business (e.g. hazardous waste ratio, non-recycled waste ratio).¹⁴¹
- Building a vision and developing a roadmap/action plan to support the circular economy, as a result contributing to an overall change of mindset in the financial industry.
- In all this, circularity performance data have an important role to play and consideration should be given to integrating related metrics in existing frameworks, like the TCFD and SASB.¹⁴²
- Establishing a multidisciplinary expert working group with the mandate to develop definitions, a taxonomy and tools to measure the circularity of companies and projects.
- Increasing awareness of circular business models and their benefits, and analysing the corresponding risks (including the integration of circularity considerations into credit risk parameters and pricing models).
- Establishing new financial instruments that allow for risk-sharing and consulting with experts to assess the technological risk of innovative circular technologies.
- Labelling financial instruments suited for financing circular economy businesses and projects.

In addition, according to the recommendations of an expert group at the European Commission, the following specific measures for the financial sector would also help to overcome hurdles for financing the circular economy:¹⁴³

Ultimately, one aspect is certain: the financial industry will be strongly affected by new opportunities, business models and risks coming with the increasing resource scarcity

and a circular economy movement. **‘Circular finance’ offers huge potential to shape – and accelerate – the transition to a circular and sustainable economy**, since financial institutions find themselves perfectly positioned at the interface to the real economy and can align financial flows accordingly.

“Investors, banks, and other financial services firms can play a vital role in rapidly scaling the circular economy by supporting businesses to make this shift, and in doing so seize new and better growth opportunities.”

Andrew Morlet, CEO Ellen MacArthur Foundation

Definitions¹⁴⁴

Circular finance

Circular finance, or circular economy finance, refers to any form of financial service or instrument integrating circular economy factors into the business or investment decisions in order to enable and accelerate the transition to a fully circular economy as a basic cornerstone of sustainable development.

Circular investing

Any type of investment that will be exclusively made to finance or re-finance new or existing companies or projects with a circular business model embedded in a circular resource strategy and generating long-term positive impact.

Key takeaways

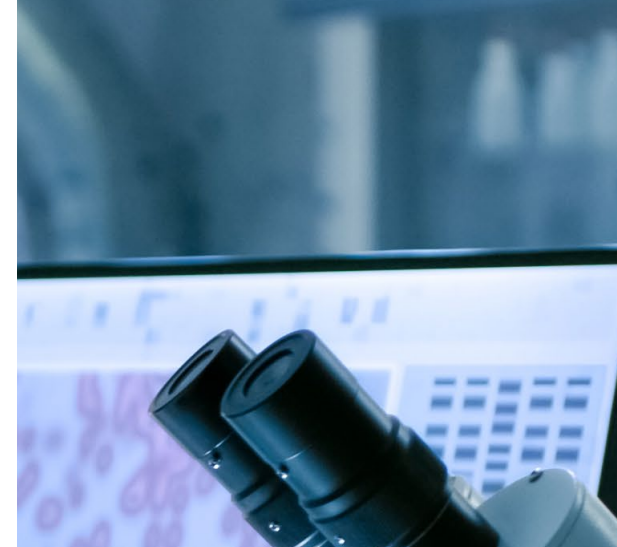
- As an enabling industry, the financial sector has a key role to play in the transition towards a circular economy.
- Circular investments, including circular bonds, and complementary services like advisory and sharing of best practices, have great potential to facilitate access to finance for circular economy companies and projects.
- Several challenges, especially related to the perception and assessment of risks, need to be overcome to make circular finance successful and effective.
- Regulators should support the financial industry in order to unlock its full potential as a circular economy enabler, e.g. by developing a common understanding and creating awareness among financial actors and project partners.





“The research-based pharmaceutical industry is supportive of the principles of the Circular Economy Action Plan and see synergies with our aspiration to safeguard the future supply of pharmaceuticals for patients and improve human health”

European Federation of Pharmaceutical Industries and Associations



4.4 Pharma sector

Introduction of CE in pharma industry

The driving motivation for the pharma industry is to improve health and well-being. According to estimates from the WHO, nearly one in four of total global deaths is the result of living or working in an unhealthy environment. Environmental risk factors like air, water, soil pollution, chemical exposures and climate change etc. contribute to more than 100 diseases and injuries.¹⁴⁵ So, reducing the environmental footprint is an important first step the pharma industry can take to positively impact human health. A shift to a circular economy could bring many health benefits and is fundamental to help limit global warming. For example, optimising materials and processes to reduce the carbon footprint will help to combat climate change – described as the greatest opportunity to advance human health in the 21st century.

Another significant negative impact the industry should tackle is responsible marketing and selling. There is increasing scrutiny of the negative impact of over-produced, over-sold and therefore wasted drugs. A lot of unused drugs enter waste disposal and water sewages. Adverse health impact comes from water and soil pollution, but also intoxication from taking too much medicine.¹⁴⁶

Despite the long-standing experience of many pharma companies in the area of sustainability, the industry faces some constraints when it comes to the implementation of circularity. This is particularly true with respect to the speed of the transition. Due to the regulatory approval process for pharma products it's quite challenging to introduce innovation in the area of product manufacturing processes and packaging etc. This means that most efforts directed at the primary packaging are still conceptual. Alternatively, changes to secondary and tertiary packaging are easier to implement as they aren't regulatory-relevant. So, current efforts in packaging

made by Novartis are all directed towards the secondary and tertiary packaging of medicines. To address technical constraints with regard to safety and storage, to mention one example, Novartis developed several alternatives to the traditionally used PVC packaging. Firstly, the company launched bio-thermoplastic packaging, a concept developed based on renewable raw materials to replace PVC foil for newly launched biologics. Secondly, the company launched a cardboard only packaging concept, with the idea of replacing all PVC or even biodegradable plastic, made to be tailored to the drug device allowing for safe transport. Thirdly, recycling plastic parts for a series of inhalers is also an idea that Novartis has been working on alongside TerraCycle, a social enterprise to help collect and recycle hard-to-recycle waste.¹⁴⁷ All in all, the change from traditional PVC packaging could let companies like Novartis become plastic neutral by not only reducing its waste (reducing its carbon and plastic footprint) but also reducing its cost factors as well.¹⁴⁸

Innovation to enable a circular economy will drive new opportunities for growth and secure long-term business value by promoting greater resource efficiency and reducing pollutants.¹⁴⁹

Additionally, and most importantly, this will also safeguard the future supply of medicines essential for patients.

Benefits of circularity in the pharma industry

Product design

The product design of pharma products is relevant. The Circular Economy Action Plan adopted by the EU Commission has identified that up to 80% of products' environmental impacts are determined in the design phase.¹⁵⁰ This highlights the importance of circularity in pharma research and development too.¹⁵¹ Therefore, in the design phase, choosing sustainable, renewable or recycled materials to preserve

resources and maximise the lifespan of products is fundamental.

An example of a move in the right direction which could have a significant impact is the 'Green Drugs' initiative by Novartis. The over-consumption and poorly managed waste of non-used medicine has impacted the environment to an extent that is still unknown. Traces of micropollutants and drugs have been found in organisms like fish, algae and drinking water. To tackle this prominent issue, Novartis implemented two distinct solutions. Firstly, every step in Novartis' value chain now includes environmentally conscious protocols. An example of this is the avoidance of pharmaceutical contamination from manufacturing processes. Unfortunately, with the lack of regulation regarding this aspect in the sector, it's a prominent risk that is challenging to tackle. Nevertheless, Novartis aims at reducing any negative impact from its products across the entire lifecycle. Secondly, Novartis joined an initiative called Prioritisation and Risk Evaluation of Medicines in the Environment (PREMIER) alongside the Innovative Medicines Initiative (IMI) with an aim of finding tools to make active pharmaceutical ingredients (API) environmentally friendly by design. By bringing together academic and industry experts, the aim of this initiative is to design green, biodegradable drugs which entails finding a molecule that is both safe and effective.

Resource efficiency – narrowing resource loops

Turning waste into secondary raw materials is a good way for pharma companies to reduce the environmental impact of their entire value chain while also reducing the costs in the long run. Quite a lot of pharma companies already apply this approach, in particular with respect to solvents, water and packaging material. One example of reusing solvents in production is Johnson & Johnson's HIV

drug Intence (see details below). But, due to the highly regulated quality and purity requirements, this approach can also pose a challenge for a lot of other pharma companies. As a result, it should be a key area for future industry collaborations to develop a market for secondary raw materials ensuring materials of adequate quality and availability.



Innovation case

Johnson & Johnson Earthwards program – narrowing resource loops

The Johnson & Johnson Earthwards program¹⁵² is dedicated to designing more sustainable products and brainstorming innovative improvements to everything from baby shampoo to surgical shears. Johnson & Johnson is setting its sights high: by 2020, it hopes to have 20% of all company revenue coming from Earthwards products. In order to earn recognition, a product must show at least three sustainability improvements across seven 'impact areas', including materials, waste reduction, packaging, energy and water use, innovation and social impact. To date, Johnson & Johnson has made more than 290 improvements across the seven impact areas in its Earthwards products portfolio.

One particular example for narrowing resource loops is the HIV drug Intence. Through the use of green chemistry techniques, Intence has seen an 88% reduction in both the amount of waste produced during manufacturing and the use of solvent (a dissolving agent) material. It's also the first product in Johnson & Johnson's portfolio to employ direct solvent reuse. In layman's terms, this means materials that would usually be disposed of after use during the manufacturing process are being reused without the need for further processing.¹⁵³

Once changes are made, the product is reviewed by a board of internal and third-party sustainability experts who determine whether to grant the Earthwards recognition. "Our [certification] process is rigorous because we want to ensure the changes we're making are meaningful," ...says Al Iannuzzi, Senior Director of Environment, Health, Safety and Sustainability, Johnson & Johnson.¹⁵⁴

Key takeaways

- The key lever to reduce the environmental impact of pharmaceutical products lies in the design phase of the products. Actively focussing R&D efforts on integrating the reuse of raw materials will not only generate a positive environmental impact but also guarantee cost savings.
- Strict regulatory quality and purity requirements pose a big challenge when it comes to using waste products as secondary raw materials. So, the pharma industry as a whole should concentrate efforts to prove the viability of recycled materials as viable input materials.
- In light of increasing regulation (e.g. EU taxonomy for sustainable activities), pharma companies will also need to transparently disclose to what extent their business activities can make a substantial contribution to environmental objectives. If tackled effectively, circular economy approaches help pharma companies make their business models truly sustainable and remain attractive for investors.



4.5 Watch and Jewellery Sector

Switzerland is home to world-renowned luxury watch and jewellery companies and is the global leader in the gold refining market. Around half of the largest luxury watch brands are Swiss and between 60% and 70% of the globally mined gold physically travels through Switzerland to be refined (~2,400 tons in 2017¹⁵⁵). Yet, the sector with its sourcing of raw materials and the rising supply of unrepairable low-quality fashion items as well as smart watches with relatively low life expectancies, has a bigger ecological and social impact than many might think.

The sourcing of raw materials like precious metals is accountable for large environmental footprints, including the pollution of air and water, soil degradation, landmass movements and deforestation. Enormous inputs of toxic substances and land transformation are responsible for the fragmentation and destruction of ecosystems and have immense negative effects on freshwater, forests



Half of the largest luxury watch brands are Swiss.

The industry uses over 50% of annual gold production (>2'000t).

Figure 13: Switzerland is home to world-renowned luxury watch and jewellery companies and is the global leader in the gold refining market. Around half of the largest luxury watch brands are Swiss, and between 60% and 70% of the globally mined gold physically travels through Switzerland to be refined (~2,400t in 2017). Source: Businesswire.com, (2016).

and wildlife.¹⁵⁶ The industry uses over 50% of annual gold production (> 2,000 tons), for instance, and in most cases the companies are not able to demonstrate where their raw

materials come from and that they weren't responsible for dramatic environmental degradation and human rights violations.¹⁵⁷



Figure 14: Recycled gold to newly mined gold accounts for only 25%.

Jewellery and watches have traditionally been a durable, long-lasting purchase, but technological changes and fashion trends are changing this paradigm, increasing the supply of less durable and short-lived jewellery and watches, which contribute additionally to overconsumption and waste production.¹⁵⁸ Without sen-

sible sustainable business models, eco-design considerations and responsible raw materials, these trends can worsen the industry's environmental impact many times over. While smart watches tend to be far more expensive than regular fashion watches, they often have similarly low life expectancies due

to rapid technological advances that make hardware and software obsolete after just a few years. And since most smart watches rely on precious metals for their electronics, they often have comparable impacts as general high-end watches but with obvious shorter lifespans.

“Richemont has invested in circular economy solutions for products, services and precious metals. For example, Richemont’s acquisition of Watchfinder in 2018 represented a strategic move into the pre-owned watch market to actively help keep ‘idle assets’ in circulation and prolong the lifespan of products. Further investment has enabled Watchfinder to open in five new markets, including Switzerland. The keys to its popularity are transparency, traceability and trustworthiness. In addition to these efforts, Richemont’s gold sourcing strategy focuses on recycled gold over newly mined gold. This choice reflects the estimated impact on the environment: recycled gold has a significantly lower impact.”

Matthew Kilgarrieff, Director CSR, Richemont

Circularity in the watch and jewellery industry

Besides the drastic environmental impacts along the supply chain of raw materials, the jewellery and watch sector is increasingly contributing to the waste problem due to lower value products with shorter life expectancies. Many of the elements that go into making low-cost, mass-produced jewellery and watches, for example, don't have enough intrinsic value to make repairability, recycling and reusability economically viable. High-end products, on the other hand, mostly contain very valuable raw materials which are worth the efforts. Precious metals like gold, silver and platinum can be recycled over and over again with no loss of quality, diamonds and gemstones don't wear out or 'go off', making the high-end jewellery and watch industry a very good example of a circular system with regard to recyclability, reusability and reparability.

Benefits of circularity in the watch and jewellery industry

Implementing circularity in the industry could result in several substantial gains, from environmental advantages, more humane living and working conditions for people along the value chains through to a more competitive positioning of the companies. An important positive environmental effect is drastically lower pollution of air, water and soil due to less dependency on newly sourced and processed raw

materials. The sector's contribution to climate change could be significantly lowered and the protection of forests and key biodiversity areas fostered and increased.¹⁵⁹ With a more circular approach when it comes to reusing raw materials from various production steps as well as returned products, companies could not only achieve substantial cost savings in production, but also increase control over their supply chain and internalise important production steps. More accountability and responsibility of companies through increased traceability and transparency as well as new opportunities for innovative business models present additional potential economic gains from shifting towards circularity.

Such changes require a well-established and functioning system of collaboration and interdependence among the actors in the sector. This explains why component manufacturers, for instance, would need their offering to include components designed for inter-operability, separation and reuse. Product development (especially for cheaper products) must take the possibilities of repair, reuse and recycle into account to facilitate the separation between diverse materials. And the value perception of the raw materials and resulting products need to experience a drastic increase to facilitate a transition towards circularity.

Circular resource strategies best

suited to the watch and jewellery industry

Watches and jewellery need to last for a long time (slowing the loop) and should be designed for circularity to facilitate recycling after end-of-use (closing the loop). In addition, regenerating resource loops should be considered when dealing with raw materials from mining: contribute to leaving the environment in a better state than how it was found (e.g. abandoned mining sites for metals), eliminate/minimise the use of toxic substances (e.g. when mining metals or stones), and seek 'net positive' strategies to leave the environment in a better state (e.g. increasing biodiversity and remediating soil) than how it was found.



Innovation cases

Due to the variety and diversity of existing approaches, it's important to note that the following examples are not to be regarded as conclusive but instead provide a glimpse of possible pathways that companies are taking towards circularity.

“For decades, we have consistently maintained a responsible use of resources, searched for eco-friendly solutions and alternative materials. This year Montaine celebrates a further milestone in becoming fully climate neutral. We intend to continue this trend in progressively reducing our ecological footprint. We see the transition towards a circular economy as an essential next step in this journey and would like other watch companies to follow our example to support future generations.”

Andre Bernheim, President of Board, Montaine

Recycling to reduce the demand for new raw materials - closing resource loops

From a circularity perspective, reducing the need for new raw materials (e.g. newly extracted metals and newly produced plastics) should be at the top of the sector's priority list. Most jewellers have always recycled a substantial part of their materials like precious metals and offered remodelling, upcycling and recycling services for old jewellery. So, recycling and repurposing valuable raw materials isn't a new phenomenon in the industry and often has simple economic reasons behind it. Nevertheless, reusing resources is very important and – next to proven and established practices – some companies are trying to lead the way with innovative approaches to reduce the need for newly extracted and processed raw materials. Companies like Bayou with Love (collections with only recycled gold from old Dell computers¹⁶⁰), Triwa (watches made from recycled destructed illegal firearms¹⁶¹), Mondaine (watch cases and straps made from recycled and upcycled ocean plastic) and Baume (focusing on recycled materials and avoiding precious metals in a specialised made-to-order approach) are just a few of the many good examples of reducing, recycling and upcycling in the sector.

The longevity of a watch or piece of jewellery, its reparability and reusability are very important aspects when it comes to reducing the consumption of newly manufactured products. As a result, moving towards a circular economy, in some aspects, can be regarded as going back to the roots of jewellery and watchmaking.

Renting and second hand - slowing resource loops

Renting, co-owning and sharing watches and jewellery instead of owning them is gaining more and more traction in the market.¹⁶² While it might not be the most feasible option when it comes to a watch or ring we wear every day, it can have apparent sustainability advantages for specific items used on rare occasions.

Companies like Haute Vault, Clerkenwell and Axess Chronos are among the fast-growing number of providers that offer renting and sharing services. Customers can choose from a wide range of different products for a specified period of time and only spend a fraction of the total cost, following the approach of 'using instead of owning'. Even though such services might not always be based on a sustainable rationale, by indirectly reducing the need to buy several new items and promoting a sharing economy, they hold the potential to positively impact the sector's ecological footprint and transition towards a circular economy.

The second-hand watch and jewellery market is a booming billion-dollar industry, and it's mostly dominated by independent third-party vendors without much active involvement of the brands themselves.¹⁶³ Unlike car manufacturers, which maintain networks of certified pre-owned dealers, watchmakers have long neglected the second-hand market, often fearing both its strategic and logistical challenges.¹⁶⁴ From a circularity perspective, second hand is highly favourable, as it avoids producing new items, increases the life of products and reduces additional negative environmental impacts.

Key takeaways

- Base decision-making on insights of life cycle analysis and constantly aim for the products' longevity and circularity.
- Make eco-design a substantial part of product design and close material and energy loops to work towards a circular approach and respecting planetary boundaries.
- Reconsider the current business model, if necessary, to drastically reduce newly sourced resources, material input and waste production.

5. Overcoming the challenges

5.1 The rebound effect

Rebound effects relate to the negative environmental side-effects of sustainable solutions.

Rebound effects described in sustainability literature include: (1) **direct** rebound, related to the immediate increase in consumer demand attributed to lower prices from increased efficiency, (2) **secondary** effects, which are increases in demand of other goods attributed to consumers spending some of the energy savings elsewhere, (3) **economy-wide effects**, which refer to the larger and more unpredictable effects that increased efficiency has on prices and demand of other goods, and (4) **transformational** effects, which refer to the potential of energy efficiency increases to change consumer preferences, societal institutions, technological advances and regulation etc.¹⁶⁵

In the circular economy, two other types can be added: rebound attributed to insufficient substitutability and rebound related to price effects. Firstly, when it comes to substitution not all recycled material (e.g. plastic and paper) can substitute virgin material and some primary materials are still required (e.g. virgin plastic). What's more, not all reused or refurbished products may appeal to everyone.¹⁶⁶ Secondly, with regard to price effects, when circular products are cheaper it's possible that more goods might be produced, sold and used, thereby leading to increased material consumption.¹⁶⁷

There are three conditions to ensure that resource-loop approaches succeed in reducing these negative rebound effects: circular alternatives should really act as substitutes, they should not increase overall demand and they should draw consumers away from primary production and consumption.¹⁶⁸

5.2 Energy use and recycling

The circular economy needs energy to reprocess materials and recycling is associated with practical concerns and limitations.

Firstly, recycling processes use up energy. Almost all recycling processes operate by breaking down a solid waste stream into a liquid, which is then purified by some means, all of which requires energy.¹⁶⁹ Even renewables like solar power that deliver 'zero carbon energy' require manufacturing which uses energy, depend on the use of critical materials, and the installations take up space and land.¹⁷⁰

Secondly, for energy-using durable products (e.g. computers, car engines and fridges), remanufacturing to reuse products and components is a viable option, but this must be balanced with the potential energy-saving measures created by newer and more energy-efficient products.¹⁷¹ For example, is it better to replace an inefficient fridge with a newer one or is it better to 'use up' the old one? This is a question that requires calculation of the energy needed to produce the product (embedded energy) compared to the future energy savings of the new product over time in the use phase (i.e. the energy needed to operate the fridge or the fuel that powers the car). But, a report by the European Environment Bureau (2019) suggests that many studies arguing for product replacement – because less energy in the use phase will offset the climate impact linked to production – generally assume very optimistic annual efficiency improvements of 5% for typical product groups like washing machines and notebooks, which are not necessarily realistic. As exemplified in the European Environment Bureau 2019 report, notebooks are gaining higher processing

capacity which requires higher energy consumption, so this needs to be balanced with longer lifespans. If we wanted to compensate for the greenhouse gas emissions linked to a notebook's non-use phases, it would need to last for 20-44 years.

Finally, there are practical limitations to recycling: Materials can't be endlessly recycled because of degrading material quality over time and contamination of waste streams making it difficult to create a clean new material. Also, certain materials like concrete and carbon fibre are challenging to recycle. This again makes the case for slowing the loop and making products last longer before closing the loop and recycling.

5.3 Cost of materials

One obstacle for companies to switch to closed-loop business models is the fact that primary raw materials are often cheaper than secondary raw materials. This is because negative externalities are not reflected in the price of primary raw materials. As a result, closed-loop business models are unable to exploit their advantages because they aren't internalised. This means that there is little incentive to change, from a profit point of view.¹⁷² This highlights the need to cooperate within and between value chains to increase efficiencies.

These trends are likely to change as the market and trade risks impact businesses' assets and liabilities, like price volatility, resource scarcity, trade bans, higher interest rates and lower investor interest.¹⁷³

5.4 Collaboration

In a future circular economy, collaboration is essential for ensuring the integration of different cycles of reuse, repair, maintenance, remanufacturing, refurbishing and – eventually – recycling.

This shows the importance of inclusive collaboration: “While more conventional approaches to sustainability, such as efficiency and productivity improvements may be largely firm-centric innovations, circular economy and sufficiency initiatives by their nature demand a broader system-level approach, and the participation and cooperation of actors across government, industry and civil society.”¹⁷⁴ While the need for cooperation may increase search and transaction costs compared to the linear business model, the resulting gains could outweigh such costs in the long term as resource scarcity become more of a reality.¹⁷⁵

5.5 Regulatory advantages and disadvantages

Market, governmental and societal actors have a variety of mechanisms to influence the transition towards a circular economy in Switzerland, ranging from voluntary action to industrial self-regulation and legislative initiatives.

On the one hand, voluntary commitments by individual institutions or a group thereof as well as self-regulation through industry standards and guidelines hold a number of advantages, e.g. the potential for highly ambitious commitments or a high degree of flexibility allowing for innovative solutions. But purely voluntary commitments are not binding and could be too vague. What’s more, insufficient transparency could lead to greenwashing. When there’s a great need for action, it’s sometimes questionable whether the collective promise of the private sector represents a regulatory alternative. For example, the incentive tax on combustible fuels came into place because the private sector didn’t achieve an emission reduction. So, voluntary market action alone is insufficient to mainstream circular finance and align financial flows with circular economy objectives.

On the other hand, a regulation-only approach through legislative initiatives bears the risk of overregulation leading to disproportionate burdens

for smaller players. In addition, it lacks a certain flexibility, constitutes a one-size-fits-all approach and often can’t keep up with the rapidly changing market environment. As a result, regulation alone is not the only solution. But it’s necessary to some extent in order to provide legal certainty and clear goals and to guarantee the legal equivalence of Switzerland with other jurisdictions.

In our view, a smart mix of voluntary, self-regulatory and regulatory action is most conducive to make ends meet and turn Switzerland into a circular economy hub. More specifically, three main points could be taken into consideration to develop a positive regulatory context for a sustainable circular economy:

- Concretising general circular economy principles into legal provisions should shift from the mainstream end-of-life approach focusing on waste, towards a more integrated life-cycling approach; principles developed in the area of waste management should be integrated further up the supply chain. For instance, the ‘polluter pays’ principle as well as the collective and combined assessment of effects in the current legislation (art. 8 of the EPA) should explicitly be integrated transversally into production and product legislation. Currently, the ‘polluter pays’ principle is only taken into consideration with regard to waste management, whereas we argue that this notion should be integrated into all stages – design, procurement, production, use and end-of-life.
- Integrating a life cycle approach by adopting regulations focusing on production and design (see e.g. Eco-Design Directive 2009/125/EC¹⁷⁶). More generally, regulations would benefit from clearer and more ambitious science-based definitions of the different value retention activities (reuse, repair, remanufacture, recycle and downcycle etc.)¹⁷⁷ Ideally, the implementation and integration of such definitions should help shift the focus to limiting inputs versus recycling outputs. What’s more, such regulations should be coupled with standardised circular economy metrics to assess their impact.

- In the current regulatory landscape, some recovery measures are strongly conditioned by their economic feasibility. Yet, in a transition period towards a new paradigm in which new innovative models and markets are emerging, the economic feasibility would benefit from being assessed with a longer time perspective in mind. In relation to this, the perception that environmental protection aspects are in tension with economic activities should be revisited, especially when assessing the proportionality of measures aimed at more stringent environmental provisions. A circular economy perspective shows that a global assessment of the situation, taking the pricing of long-term environmental risks alongside climate change and energy targets into account, would require giving greater weight to environmental public interests. In the longer-run, such a perspective can provide a stable context and sustainable resource base for economic activities.

We further follow the argumentation of Swiss Fintech Innovations that regulation should be principle-based, allowing for sufficient flexibility regarding the individual approach to achieving circular objectives while providing clear objectives on the topic. As a result, it should be designed with a view to promoting innovation and circular tech, enabling efficient, viable implementation in line with specific business models and business needs.¹⁷⁸

5.6 Designing sustainable circular business models

According to European eco-design research, up to 80% of a product’s environmental waste impacts are determined in the design phase.¹⁷⁹ Eco-design is a promising process by which all the environmental impacts of a product are taken into consideration from the earliest design stages in an effort to promote coordinated and integrated product planning at all stages of the product, from its conception and usage to the end-of-life.¹⁸⁰ The current ‘take-make-dispose’ system doesn’t provide sufficient incentives to make products circular.

Here Swiss businesses and organisations can begin integrating eco-design methodologies like those suggested by the Eco-design Directive or Rapid Circularity Assessment to begin thinking in this direction. “At every stage of the design process we need to both zoom in on the user needs and zoom out to consider the systemic implications, oscillating continuously between these two equally critical perspectives.”¹⁸¹

To test the initial environmental viability of a new circular business model, businesses can apply a series of different design tools, the details of which are to be elaborated in a further white paper.

But, design and impact measurement go hand in hand. Unfortunately, this symbiotic practice has yet to be established as a standard practice across Swiss industries.

5.7 Measuring circularity

“What gets measured gets managed” – this quote by Peter Duker reveals a pitfall for the targeted transition towards a more sustainable, circular economy. Today, mass-based indicators like recycling rates are used to assess the circularity of individual products, firms and of entire countries. But these indicators fail to cover the environmental perspective – one of the most commonly mentioned reasons to move from a linear to a circular economy.”¹⁸² This challenge is true at all levels of the system – macro, meso and micro – that is to say, at business level.

For existing businesses operating according to a linear model, it’s essential to have an overview of its material flows and, more importantly, its material leakages to begin reassessing where and how to pivot their current model. Unlike businesses looking to launch with a new circular offering, they’re required to design-in environmental considerations from the very beginning and consider how to measure their impact across the value chain.

A mass flow analysis is a good way to understand a company’s material flows. Nevertheless, carrying out a life cycle assessment is considered to be a good way to make sure that new circular economy projects and measures do in fact reduce environmental impacts.

There is a growing number of indicators being developed to ensure environmentally sustainable circular business models. A recent Swiss study suggested a new systemic indicator formulated on the basis of environmental value retention called the retained environmental value (REV). It’s based on the life cycle assessment. It “measures the share of the environmental impact (EI) from the production of a material or product that is retained in products and materials recovered from reuse, remanufacturing or recycling, i.e. the REV (Eq. (1)) quantifies the share of the original environmental impact that can be retained in the technosphere through value retention processes.” The goal of this ‘home-grown’ indicator is to foster the transition towards a sustainable circular economy, revealing the pitfalls of the waste hierarchy and providing a basis for impact-based policy making. The REV will be tested in 2020 and 2021 to check its applicability for businesses and national sustainable circularity assessment.

While companies, policy-makers and societies need to shift their activities toward more sustainable circular models, measuring where they are and their progress in a standardised manner will be essential to work towards a resilient society and economy which functions within the Earth’s carrying capacity.



6. Conclusion and recommendations

How can Switzerland avoid missing the circular economy train? While circular economy is receiving growing attention across the Swiss private and public sectors,¹⁸³ the economic, environmental and societal circular opportunity is far from exhausted.

In economic terms, the circular economy represents a multi-billion Franc business opportunity in terms of recovered resource value, access to new markets and new green investment funding, as well as the value created through new value proposition offers. For Swiss businesses this means capitalising on new circular business opportunities while offsetting impending 'linear risks' associated with future resource shortages and their impacts on prices, supply chain continuity as well as the market dynamics of continuing the 'business as usual' approach.¹⁸⁴ Swiss businesses with global supply chains are well placed to benefit from taking a proactive approach to such issues,

particularly in light of the circular policies of our largest trade neighbour and partner, the European Circular Economy Action Plan as well as parliamentary discussions on becoming CO₂-neutral by 2050.

In social terms, the growing interest in shifting toward more sustainable and circular societies, circular jobs are likely to play an integral part across the public and private sector and as a result create greater welfare effects. In addition, the ongoing coronavirus crisis has promoted a greater consciousness for the need for sustainability in the long term, affecting our values and norms.¹⁸⁵ Moreover, social benefits are created indirectly, as the reduced pollution resulting from the circular economy and more locally sourced and less toxic products will lead to both improved health and reduced healthcare costs.¹⁸⁶

In environmental terms, the circular economy can play a key role in

reducing resource use and emissions and contributing towards the net zero target. This is crucial, since as a result of the globally increasing consumption of resources, climate stability and ecosystems worldwide are at the limits of their resilience. Switzerland also contributes to this situation through its high per capita consumption of resources.¹⁸⁷ The four strategies – slowing, closing, narrowing and regenerating resource-loops – are a promising vehicle to help policy-makers, businesses and society transition to a more effective use of resources and ultimately strive for an overall reduction of inputs across value and supply chains.

Encouragingly, Switzerland is – at least in theory – well placed to address its unsustainable consumption patterns and perhaps even become a circular economy leader by making the most of its innovation, investment and sustainability potential.



6.1 Key takeaways from the Swiss sectors

For businesses in the food, textile, financial services, pharma and watch and jewellery industries, the key circular take-aways can be summarised as follows:

Industry	Strategy	Business and operations
Food	To reach SDG 12.3 the efforts for circularity in the food sector have to be amplified at the beginning and end of the chain.	<ul style="list-style-type: none"> Companies and countries should have a unified approach to the monitoring and reporting of food waste. Educate and support consumers to make responsible consumption decisions. Product and process design needs to take food waste into account and design-out food waste. Enable and support innovation to take upstream and downstream into account (e.g. through industrial symbiosis, redistributing food that would otherwise go to waste or avoiding package sizes and promotions that lead to food waste in households or considering regenerative methods for agriculture in the production of food).
Textile	<ul style="list-style-type: none"> Slowing loops – finding new ways to extend product durability and use whilst curbing consumption Closing loops – developing innovations in sorting and collection 	New business models which create value from durable products/design (service-based). It will be crucial to make sure clothing is durable not disposable, and durability needs to become more attractive to businesses and consumers in order to slow the resource loops. Designing and producing clothes of higher quality and providing access to them through new business models would help shift the perception of clothing from a disposable item to a valuable, durable product.
Financial services	<ul style="list-style-type: none"> As an enabling industry, the financial sector has a major role to play in the transition towards a circular economy Regulators could be involved in creating new standards and setting favourable framework conditions 	<p>Circular investments including circular bonds and complementary services like advisory (e.g. on circular financial products or project structuring) and sharing of best practices have great potential to facilitate access to finance for circular economy companies and projects.</p> <p>Several challenges, especially related to risk assessment and pricing models, need to be overcome to make circular finance successful and effective.</p>
Pharma	<ul style="list-style-type: none"> The key lever to reduce the environmental impact of pharmaceutical products lies in the design phase of the products Foster collaboration across industrial sectors to reap the benefits of industrial symbiosis 	<ul style="list-style-type: none"> Actively focussing R&D efforts in this area will not only generate a positive environmental impact but also guarantee cost savings. Strict regulatory quality and purity requirements pose a big challenge when it comes to using waste products as secondary raw materials. So, concentrate efforts to prove the viability of recycled materials as viable input materials.
Watch and Jewellery	Base decision-making on insights of life cycle analysis and constantly aim for the products' longevity and circularity.	<p>Base decision-making on insights of life cycle analysis and constantly aim for the products' longevity and circularity.</p> <p>Make eco-design a substantial part of product design and close material and energy loops to work towards a circular approach and respect planetary boundaries.</p> <p>Reconsider the current business model, if necessary, to drastically reduce resources, material input and waste production.</p>

6.2 10-point recommendations for a circular Switzerland

More broadly speaking, in order for Switzerland to make the most of its advantages and accelerate the transition to a resilient circular society and economy, this white paper makes recommendations in the following areas:

- 1. **Switzerland is lagging behind on circular targets, action and policy**
- 2. **Going beyond recycling**
- 3. **Collaborating to address environmental hotspots**
- 4. **Innovating and experimenting for new circular models**
- 5. **Designing-in sustainability from the very beginning**
- 6. **Measuring and reporting for circular success**
- 7. **Leveraging the Finance sector to accelerate the circular transition**
- 8. **Developing the smart mix of voluntary action, cooperation, regulation and incentives**
- 9. **Developing a Circular Economy roadmap for Switzerland**
- 10. **Keeping the big picture in mind**

1. Catching up on circular targets, action and policy

The topic of circular economy has long since made it onto the agenda of European politics, businesses and regulators. The EU and member states have already set up ambitious and concrete goals with respect to a circular economy and are taking action at numerous levels – including policy, investments and implementation. From a regulatory perspective, European countries are integrating various approaches to enhance and foster more circularity, ranging from incentivising waste reduction (France) and strengthening the market for recycled resources (Denmark) to promoting circular procurement strategies (Netherlands). With regard to investment, the European Green Deal Investment Plan (EGDIP), plans

to mobilise at least EUR 1 trillion for climate action and environmental sustainability from 2021 to 2030. Circular economy innovations are “expected to contribute significantly” to this European Investment Bank’s strategy as illustrated by the creation of the European Circular Bioeconomy Fund (ECBF) of EUR 250 million.¹⁸⁸ And finally, at implementation level we can observe a series of pilots, re-search studies and circular initiatives to facilitate the transition.

The European Union is one of Switzerland’s most important trading partners, accounting for 60% of its trade volume in 2018.¹⁸⁹ Consequently, the imminent regulatory developments on circular economy in Europe are to be taken seriously by Swiss businesses, in order to maintain its competitive advantage going forward.

Undeniably, Switzerland is making steps in the right direction, yet it’s lagging far behind, e.g. when it comes to ambitious, clear circular and resource-based targets as well as supporting legislation. Switzerland needs to catch up on circular economy action and policy – the sooner the better.

2. Going beyond recycling

Slowing, closing and regenerating loops are considered to be central strategies to design for sustainable circular business models.¹⁹⁰

While Switzerland may be considered a recycling leader for municipal solid waste (52% in 2018), FOEN estimated in 2018 that only 13% of the materials currently consumed in Switzerland come from waste. What’s more, they highlight that even if all waste could be recovered, “it would only cover one-fifth of the current material needs.” This low circularity material use coupled with its disproportionately high per capita consumption further emphasises the need for Swiss businesses and stakeholders to focus on ‘slowing’ and, in the best case, also ‘regenerating’ resource loop strategies to strive for an overall reduction in the use of resources.

To understand which industries should be targeted for increased circularity, the Federal Office for the Environment analysed Swiss value chains to identify the environmental ‘hotspots’¹⁹¹. Building on this existing research, policy-makers, regional representatives and businesses can assess their role in the value chain and seek to identify which resource loop strategy could best address the most environmentally detrimental value chains with the most appropriate strategy.

3. Collaborating to address environmental hotspots

We can’t do it alone. A circular business can only be truly circular when working in collaboration with stakeholders across its value chain – from procurement to the user, to the re-user of the resource at the end of a product’s life cycle. Two steps are recommended to help the Swiss public and private sector stakeholders work together more effectively.

In a first step, similar to the European Circular Economy Stakeholder Platform (ECESP) approach, the public sector or academia could research the required synergies¹⁹² and potential for circular cooperation and alliances across value chains, particularly focusing on the environmental hotspots for closing, slowing and regenerating loops. For businesses wishing to get actively more quickly, they can undertake their own lifecycle analysis as well as stakeholder analysis and material flows to identify which potential partners could help create, reduce, reuse or remanufacture their bi-products or material waste to close the loops at the end of a product’s life.

As a next step, such collaborations could be incentivised or fast tracked to encourage more sustainable circular solutions by providing round tables for exchanges, marketplaces for resources or bi-products and financial support for those testing collaborative innovations with impact.

4. Innovating and experimenting for circular business models

Transitioning from the mainstream take-make-dispose approach to circular business models will require businesses to rethink many existing processes.

Given the exploratory nature and the varying contextual settings of different businesses, experimentation is essential to conceptualise, design and implement new means of value creation which prioritise the slowing of consumption to create absolute reductions in environmental impact.¹⁹³ Businesses need to reconsider their short-term profit maximisation approaches in preference of longer-term value creation, which balances the needs of the user taking the broader view of the impending climate and associated resource risks. By focusing on small reductions in short-term sales in return for longer-term business model resilience, businesses can explore models which are not dependent on selling more but rather on:

- promoting quality over quantity
- focusing on service not products
- giving products a second (and third, fourth etc..) life
- lower cost, frugal innovations¹⁹⁴

The public sector can play a central role in facilitating circular innovations by, for instance, tying public innovation funds and procurement to circular criteria, offsetting the risk of experimenting or transitioning to new models by encouraging pilots which reduce waste, or simply providing a knowledge hub where businesses of all sizes can begin informing themselves of the opportunities, methods and platforms available to them.¹⁹⁵

5. Designing-in sustainability from the very beginning

According to European eco-design research, up to 80% of a product’s environmental waste impacts are determined in the design phase.¹⁹⁶

Eco-design is a promising process by which all the environmental impacts of a product are taken into consideration from the earliest design stages in an effort to promote coordinated and integrated product planning at all stages of the product from its conception and usage to the end-of-life.¹⁹⁷ The current ‘take-make-dispose’ system doesn’t provide sufficient incentives to make products circular. Here Swiss businesses and organisations can begin integrating eco-design methodologies like those suggested by the Eco-design Directive or Rapid Circularity Assessment principles to begin thinking in this direction. But design and impact measurement must go hand in hand.

6. Setting measurable circularity targets and measuring for circular economy success

True to the motto ‘What gets measured, gets done’, the Federal Council should enhance transparency by mandating disclosure or actively support companies to disclose their environmental impacts in a standardised manner and publish them on a centralised platform. Regulators should further facilitate and harmonise due diligence and reporting, as well as contribute to the standardisation of definitions and metrics for circular activities. Businesses seeking to pro-actively engage in the circular economy should take steps to understand where they stand, what the material flows look like, where their hotspots are in terms of environmental impacts and set clear and measurable goals to track their progress towards a sustainable circular economy.

7. Using the Swiss financial sector to accelerate the circular transition

The Federal Council should develop a Swiss action plan on circular economy, suggesting concrete legislative and incentivising measures, in order for Switzerland to become a leader in circular finance, too. To unlock the financial sector’s potential as an ena-

bling industry for the circular economy, regulators and financial service providers must work together to:¹⁹⁸

- develop a common understanding of the circular economy including the challenges and opportunities among different stakeholders
- create awareness about circular solutions and make them a priority
- build a vision and develop a roadmap/action plan to support the circular economy, thereby contributing to an overall change of mindset in the financial industry.

8. Developing a smart mix of voluntary action, cooperation, regulation and incentives

Market, governmental and societal actors have a variety of mechanisms to influence the transition towards a circular economy in Switzerland, ranging from voluntary action to industrial self-regulation and legislative initiatives.

Current initiatives and developments at federal level (Postulates 12.3777, 20.433 and 18.3509 of the Glacier-Initiative, the Green Economy report and the work of the Environment, Spatial Planning and EnergyCommittee (ESPEC)) as well as parliamentary initiative 17.3505, are steps in the right direction. Initial scientific results from the nationally funded LACE research project¹⁹⁹ indicate that the principles are integrated in Swiss Environmental Protection Act.²⁰⁰ The constitutional provisions provide enabling conditions for the circular economy.²⁰¹ Yet, their findings highlight the need to further integrate these principles and the underlying life cycle approach into sectoral policies and translate them into directly applicable instruments in order to accelerate the transition.²⁰² Concrete examples of possible circular economy legislation or approaches can be seen in view of regulatory advantages and disadvantages in section 5.6.

In keeping with the concept of ‘smart regulation’, a mix of voluntary, self-regulatory and regulatory action is most conducive to make ends meet and turn Switzerland into a circular economy hub.²⁰³ In line with Swiss Fintech Innovations,²⁰⁴ we further argue that regulation should be principle- and target-based, allowing for sufficient flexibility regarding the individual approach to achieving circular objectives while setting the scope of action and material targets. As a result, it should be designed with a view to promoting innovation and circular tech, enabling efficient, viable implementation in line with specific business models and business needs. What’s more, options for more far-reaching regulation should also be incorporated if intermediate targets aren’t reached.

9. Developing a circular economy roadmap for Switzerland

Switzerland has committed itself to a series of goals contributing to Agenda 2030 of the Sustainable Development Goals and the Paris Agreement 2015.²⁰⁵ A dedicated and complementary circular econ-

omy strategy could offer a cohesive vehicle to attaining its commitments. As a result, the Federal Council should establish a circular economy roadmap with an accompanying steering committee to further enable multi-stakeholder engagement and action, reflecting and defining how Switzerland should adapt to the new legislative requirements and improving the knowledge base on associated circular issues. While strategies alone may not change Swiss policies at sectoral level, nationally set targets can help motivate and let cantons, businesses and civil society actors to work towards a common goal in a co-ordinated manner. This can be seen with the 2050 climate targets agreed by Switzerland.

10. Keeping the big picture in mind

There are three conditions to make sure that sustainable circular approaches succeed in reducing negative rebound effects: circular alternatives should really act as substitutes, they shouldn’t increase overall demand and they should draw consumers away from primary production and consumption.²⁰⁶

Here politics has a role to play in making sure that Swiss domestic consumption and production trends are assessed as a whole, taking into consideration the larger systemic effects and resource trends across the country. The Federal Office for the Environment already tracks the development of consumption-based environmental impacts using a broad set of indicators including biodiversity and the nitrogen cycle, as well as greenhouse gas emissions. Building on this research with recent reports like the ‘Environmental Atlas of Swiss Supply Chains’ and the ‘Material flow accounts’ could in future become important reports for measuring the progress as a whole.



Endnotes

- 1 NASA, 2020; WWF-PwC, 2020; PwC, 2020
- 2 Definition of the Anthropocene: the period of time during which human activities have had an environmental impact on the Earth regarded as constituting a distinct geological age. Most scientists agree that humans have had a hand in warming Earth’s climate since the industrial revolution – some even argue that we are living in a new geological epoch, dubbed the Anthropocene – Nature, 12 February 2004.
- 3 PwC, 2019.
- 4 FOEN, 2018.
- 5 Rockström et al, 2009a; 2009b; Steffen et al., 2015.
- 6 FOEN, 2019.
- 7 Steffen et al., 2015b.
- 8 Steffen et al., 2015b.
- 9 IRP, 2019.
- 10 IRP, 2019.
- 11 NASA, 2020; WWF-PwC, 2020; PwC Megatrends, 2020.
- 12 70% of drugs used for cancer are natural or are synthetic products inspired by nature. 30% of climate change mitigation could be provided by natural climate solutions by 2030 (WWF, PwC 2020).
- 13 FinanCE Working Group, 2018.
- 14 FinanCE Working Group, 2018.
- 15 Braungart, McDonough, & Bollinger, 2007.
- 16 Ellen MacArthur Foundation, 2013.
- 17 Circle Economy, 2020.
- 18 Ellen MacArthur Foundation, SUN, McKinsey & Co., 2015.
- 19 Ellen MacArthur Foundation, 2013.
- 20 Bakker et al., 2014; European Environment Bureau, 2019.
- 21 OECD 2018.
- 22 European Parliament, 2017.
- 23 Stahel, 2010.
- 24 Allwood, 2014; Desing et al., 2020.
- 25 Bocken et al., 2016a; Stahel, 2010; Konietzko et al., 2020; McDonough & Braungart, 2002.
- 26 Brundtland, 1987.
- 27 Bocken et al., 2016a; Stahel, 2010; Konietzko et al., 2020; McDonough & Braungart, 2002; Geissdörfer et al., 2017.
- 28 Allwood, 2018.
- 29 Allwood, 2018.
- 30 Federal Office for Statistics, 2020.
- 31 Konietzko et al., 2020;
- 32 Directive 2009/125/EC of the European Parliament.
- 33 Bocken et al., 2016a
- 34 Desing et al., 2020. The resource pressure method seeks to integrate primary resource considerations into the product design phase of circular strategies. This method is based on six design parameters: mass in product, product lifetime, manufacturing losses, primary material content, recyclability and cascability. It offers a means assessment of design decisions in a quantitative manner in an effort increase to sustainable circular design.
- 35 EPI, 2020; GPI, 2020.
- 36 Global Innovation Index (GII): provides detailed metrics about the innovation performance of 131 countries and economies around the world. Its 80 indicators explore a broad vision of innovation, including political environment, education, infrastructure, business sophistication, research and development, ICT industries and knowledge and technology outputs.
- 37 IMF, 2019.
- 38 EPI, 2020.
- 39 Global Footprint Network (2015), United Nations SCP Hotspot Analysis Tool (SCP-HAT) (2015).
- 40 FOEN, 2018.
- 41 FOEN, 2018.
- 42 FSO, 2018.
- 43 Frischknecht et al., 2018.
- 44 Frischknecht et al., 2018.
- 45 FOEN, 2020.
- 46 FOEN, 2018a.
- 47 FOEN, 2018b.
- 48 FOEN, 2018b.

- 49 FOEN, 2018b.
- 50 FOEN, 2016.
- 51 FOEN, 2018b.
- 52 See www.texaid.ch. TEXAID collects over 37,000 tonnes of the total 50,000.
- 53 Businesswire.com, (2016): <https://www.businesswire.com/news/home/20160718005552/en/Jewellery-Records-316-Billion-Sales-2016-15>.
- 54 Swissinfo, 2019.
- 55 Federal Statistical Office (2020), Environment – Pocket Statistics 2020. Neuchâtel: Federal Statistical Office (<https://www.bfs.admin.ch/bfs/fr/home/actualites/agenda.assetdetail.13772664.html>).
- 56 Parlamentarische Initiative 20. 433 “Schweizer Kreislaufwirtschaft stärken”.
- 57 Moussu, 2020.
- 58 Bundesrat Postulates 17.3505, 2020.
- 59 Bundesrat Postulates 17.3505, 2020.
- 60 Erläuternder Bericht zur Volksinitiative «Für ein gesundes Klima (Gletscher-Initiative)» und zum direkten Gegenentwurf (Bundesbeschluss über die Klimapolitik), 2020.
- 61 The Laboratory for Applied Circular Economy (LACE) is an inter- and trans-disciplinary project that gathers researchers from three Swiss higher-education institutions (University of St Gallen, University of Lausanne, Empa), and from various disciplines: environmental and material sciences, business administration, as well as law and political sciences. The LACE project is working together with seven well-known partner companies in order to show how the resource-efficient patterns of the circular economy and related business models can be introduced into the value chains of the participating companies. The aim of this project is to demonstrate that the principles of circular economy can be ecologically beneficial and profitable for Swiss companies.
- 62 For instance: waste hierarchy – avoidance – limitation – recovery – national treatment [see art. 30 EPA], polluter-pays principle [art. 2 EPA], ‘integrated’ assessment of effects [see art. 8 EPA]. For the overall argument, see: Brunner (2020), p. 367 et seq. Vers une économie circulaire des emballages de boissons en verre en Suisse – limites et apports du cadre réglementaire, Partie I: Etat des lieux, in Droit de l’environnement en pratique, No. 4, 2020, p. 367 et seq.
- 63 For instance: sustainable development [art. 2 al. 2 Cst. and 73 Cst.] and long-term preservation of resources [art. 2 al. 4 Cst. and 74 Cst.].
- 64 Ideally the setting of targets should be based on the environmental footprint (or another method adopting a consumption perspective approach of impacts), to minimise externalities or the shifting of environmental burdens beyond our borders.
- 65 FSO, 2020.
- 66 European Commission, 2015.
- 67 European Commission, 2019a, European Commission, 2019b.
- 68 European Commission, 2020a.
- 69 European Commission, 2020a.
- 70 European Commission, 2020a.
- 71 European Commission, 2020b.
- 72 European Commission, 2020b.
- 73 EEA, 2019.
- 74 European Circular Economy Stakeholder Platform, 2019.
- 75 Code de la consommation (2019), Article L. 111-3.
- 76 The Local, 2018.
- 77 EEA, 2019.
- 78 EEA, 2019.
- 79 The Danish Government, 2018.
- 80 Government of the Netherlands, n.d.
- 81 Dutch Ministry of Infrastructure and Water Management, 2019.
- 82 Dutch Ministry of Infrastructure and Water Management, 2019.
- 83 Krozer & Doelman, 2003.
- 84 Based on calculations conducted by the Ellen MacArthur Foundation, 2020; Ellen MacArthur Foundation, SUN, McKinsey & Co., 2015.
- 85 Swiss Sustainable Finance (SSF), 2020. This report refers to the term sustainable investments (SI) as any investment approach integrating environmental, social and governance (ESG) factors into the selection and management of investments. These include exclusions, norms-based screening, best-in-class, ESG integration, ESG voting, ESG engagement, sustainable thematic investments and impact investing. The figure CHF 1,163.3 billion covers Sustainable Investment (SI) funds (147% increase), sustainable mandates (195% increase) and sustainable assets of asset owners (6% increase). The SI market growth can be ascribed to three main effects: a wider adoption of SI approaches, the positive market performance in 2019 (approximately 18 percentage points of observed growth) and changes in methodology. On the level of sustainable funds, the volumes more than doubled to CHF 470.7 billion and now represent 38% of the overall Swiss fund market (compared to 18% in 2018). The amount of SI reported by asset owners (CHF 483.7 billion) corresponds to approximately 30% of the total assets managed by Swiss pension funds and insurance companies.
- 86 EU, 2020.
- 87 Waste is calculated in terms of the total domestic material consumption. “Total material consumption in 2018 was estimated at 109 million tonnes, of which 15 million tonnes came from recovery and 94 million tonnes from domestic extraction or imports.” – FSO, 2020.
- 88 FSO, 2020.
- 89 H2 Mobility Switzerland Association, 2020.
- 90 Estimation based on calculations conducted in Wijkman and Skånberg, 2015.
- 91 Ellen MacArthur Foundation. 2020.
- 92 McKinsey, 2020; FinanCE Working Group, 2020.
- 93 Within the framework of the Sustainable Development Goals (SDGs), Switzerland is called upon to halve per capita food waste at retail and consumer level by 2030 and to reduce food losses in production and processing. This means the total environmental impact of food would be reduced by 10-15 percent (see <https://www.bafu.admin.ch/bafu/de/home/themen/wirtschaft-konsum/mitteilungen.msg-id-76808.html>).
- 94 Avoidable food waste is the food waste, that could have been consumed instead of wasted no matter at which stage of the supply chain.
- 95 Beretta, 2018.
- 96 Beretta & Hellweg, 2019.
- 97 Except from households, where 48% of food waste ultimately goes to incineration plants.
- 98 The environmental impacts have been calculated using the ecological scarcity method and are expressed in UBP. This method weights different environmental impacts in a life cycle assessment using so-called eco-factors. The eco-factor is not independent from environmental legislation or corresponding political objectives. In Switzerland, the following impacts are currently included in the calculation: water resources, mineral primary resources, land use, climate change, ozone layer depletion, main pollutants and PM, carcinogenic substances into air, heavy metals into air, water pollutants, heavy metals into water, POP into water, pesticides into soil, heavy metals into soil, radioactive substances into air, radioactive substances into water, noise, non-radioactive waste disposal, radioactive waste disposal (FOEN, 2013).
- 99 Beretta & Hellweg, 2019.
- 100 Beretta & Hellweg, 2019.
- 101 By 2030, to halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.
- 102 The figures come from various studies and were broken down by supply chain actor on the FOEN website (<https://www.bafu.admin.ch/bafu/en/home/topics/waste/guide-to-waste-a-z/biodegradable-waste/types-of-waste/lebensmittelabfaelle.html>). The CHF 7 billion do not include the food processing industry for which no data was available at all. Yet, there are certain limitations to the methods of estimations and the figures can only be considered rough estimations.
- 103 Discussion with Claudio Beretta on 20 August 2020.
- 104 <http://chocolatshalba.ch>
- 105 <https://growcer.com>
- 106 www.kitro.ch
- 107 <https://toogoodtogo.ch/de-ch>
- 108 <https://savefood.ch>
- 109 According to the UN Conference on Trade and Development (UNCTAD), 2019.
- 110 Ellen MacArthur Foundation, 2017.
- 111 EMF, 2017
- 112 See <https://www.fashionrevolution.ch/> for further information.
- 113 See www.texaid.ch. TEXAID collects over 37,000 tonnes of the total 50,000.
- 114 See UN Environment 2020 (<https://www.unenvironment.org/news-and-stories/story/putting-brakes-fast-fashion>).
- 115 A new textiles economy: redesigning fashion’s future, Ellen MacArthur Foundation, 2015.
- 116 Fashion and the circular economy, Ellen MacArthur Foundation, 2020.
- 117 “Environmental impact of the textile and clothing industry”, European Parliamentary Research Service (EPRS, 2019).
- 118 <https://www.lenzing.com/>
- 119 <https://www.freitag.ch/>
- 120 <https://www.calida.com/>
- 121 <https://www.c-and-a.com/>
- 122 <https://stotzfabrics.ch>
- 123 <https://www.wear2wear.org/>
- 124 <https://upsettextiles.com/>
- 125 <https://www.muntagnard.ch/>
- 126 According to the Sustainable Finance Disclosure Regulation (SFDR), principal adverse impacts should be understood as those impacts of investment decisions and advice that result in negative effects on sustainability factors (see Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector).

- 127 See Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088
- 128 Ellen McArthur Foundation, 2020.
- 129 see Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088
- 130 European Commission, 2019.
- 131 EIB, 2020.
- 132 WWF & PwC, 2020.
- 133 Ellen MacArthur Foundation, 2020.
- 134 WWF & PwC, 2020.
- 135 DECALIA Asset Management, 2018.
- 136 Ellen MacArthur Foundation, 2020.
- 137 ABN Amro, ING, Rabobank, 2018a, ABN Amro, ING, Rabobank, 2018b.
- 138 BNP Paribas, 2017.
- 139 EIB, 2020.
- 140 EIB, 2020.
- 141 According to Annex I of the Sustainable Finance Disclosure Regulation (SFDR), the hazardous waste ratio metric is defined as weight in tonnes of hazardous waste generated by investee companies per million CHF invested, expressed as a weighted average. The non-recycled waste ratio metric is defined as weight in tonnes of non-recycled waste generated by investee companies per million CHF invested, expressed as a weighted average.
- 142 Ellen MacArthur Foundation, 2020.
- 143 European Commission, 2019.
- 144 Definitions are adapted from the sustainable finance definition of Swiss Sustainable Finance https://www.sustainablefinance.ch/en/glossary-_content---1--3077.html#anchor_PQWWKP; and the definition of circular finance contained in ABN Amro, ING, Rabobank, 2018.
- 145 WHO, 2016.
- 146 Hensher, Martin & Tisdell, John & Zimitat, Craig. (2017). “Too much medicine”: Insights and explanations from economic theory and research. *Social Science & Medicine*. Available at https://www.researchgate.net/publication/312523270_Too_much_medicine_Insights_and_explanations_from_economic_theory_and_research (Accessed: 11 November 2020).
- 147 <https://www.terracycle.com/en-US/about-terracycle>
- 148 <https://live.novartis.com/article/repackaging-medicine/intro>
- 149 EFPIA, 2020.
- 150 European Commission, 2014.
- 151 EFPIA, 2020.
- 152 Johnson & Johnson, 2020. <https://www.jnj.com/innovation/earthwards-a-johnson-and-johnson-program-helping-create-a-more-sustainable-world>
- 153 Johnson & Johnson, 2020. <https://www.jnj.com/innovation/earthwards-a-johnson-and-johnson-program-helping-create-a-more-sustainable-world>
- 154 Johnson & Johnson, 2020. <https://www.jnj.com/innovation/earthwards-a-johnson-and-johnson-program-helping-create-a-more-sustainable-world>
- 155 Businesswire.com, (2016): <https://www.businesswire.com/news/home/20160718005552/en/Jewellery-Records-316-Billion-Sales-2016-15>.
- 156 Human Rights Watch (2018): The Hidden Costs of Jewellery. <https://www.hrw.org/report/2018/02/08/hidden-cost-jewellery/human-rights-supply-chains-and-re-sponsibility-jewellery>; Society for Threatened People (2018): Switzerland –a Hub for Risky Gold? <https://www.gfbv.ch/en/media/reports/>; Public Eye: <https://www.publiceye.ch/de/kampagnen-aktionen/ein-goldenes-geschaeft/>
- 157 Gold.org (2017): <https://www.gold.org/research/gold-demand-trends/gold-demand-trends-full-year-2017/jewellery>
- 158 Mc Kinsey, <https://www.mckinsey.com/industries/retail/our-insights/a-multifaceted-future-the-jewellery-industry-in-2020>.
- 159 Wake Forest University. «Rainforest destruction from gold mining hits all-time high in Peru.» *ScienceDaily* (8 November 2018).
- 160 Bayouwithlove.com
- 161 Triwa.com
- 162 Luxury Jewellery and Watchmakers, A.T. Kearney (2018).
- 163 Bloomberg (2018).
- 164 New York Times, <https://www.nytimes.com/2018/01/15/fashion/watches-resale-maximilian-busser.html>
- 165 Greening et al., 2000; Zink & Geyer, 2017.
- 166 Zink & Geyer, 2017.
- 167 Zink & Geyer, 2017.
- 168 Zink & Geyer, 2017.
- 169 Allwood, 2014; 2018.
- 170 Chu & Majumdar, 2012.
- 171 Gutowski et al., 2011.
- 172 Bundesrat Postulates 17.3505, 2020.
- 173 FinanCE Working Group, 2018.
- 174 Bocken & Short, 2020.
- 175 FinanCE Group, 2002.
- 176 Directive 2009/125/EC of the European Parliament.
- 177 For instance, recycling in the Beverage Container Ordinance focuses on recycling AND downcycling. BAFU statistics don’t distinguish between the different valorisation options when communicating about the very high ‘recycling rate’ for glass for example. This gives an impression of almost closed cycles, where there’s little room for improvement. But this is actually a ‘collection rate’.
- 178 Swiss Fintech Innovations, 2019.
- 179 <https://op.europa.eu/en/publication-detail/-/publication/4d42d597-4f92-4498-8e1d-857cc157e6db>
- 180 The Ecodesign Directive provides a coherent and integrated framework which allows setting mandatory ecodesign requirements for some products.
- 181 Ellen MacArthur Foundation, 2019 <https://www.ellenmacarthurfoundation.org/explore/circular-design>
- 182 <https://www.sciencedirect.com/science/article/pii/S2665972719300054?via%3Dihub>
- 183 Circular Economy Switzerland, 2020.
- 184 Circle Economy, PGGM, KPMG, EBRD, WBCSD, 2018.
- 185 ING Study, 2020; Circular Economy Switzerland, 2020.
- 186 Ellen MacArthur Foundation.
- 187 FOEN, 2018.
- 188 EU, 2020; EIB, 2020.
- 189 FSO, 2020.
- 190 Stahel, 1994; Bocken et al. 2016; Konietzko, 2020.
- 191 FOEN, 2019.
- 192 Spatial Foresight, 2019.
- 193 Bocken, 2018.
- 194 Bocken, 2018.
- 195 Bocken, 2020.
- 196 <https://op.europa.eu/en/publication-detail/-/publication/4d42d597-4f92-4498-8e1d-857cc157e6db>
- 197 The Ecodesign Directive provides a coherent and integrated framework which allows setting mandatory ecodesign requirements for some products.
- 198 EIB, 2020.
- 199 “Laboratory for circular economy: the focus of research is on the circular economy. This refers to the practice of not simply disposing of products at the end of their life, but rather disassembling, refreshing and profitably reintroducing them into a new product cycle. For over twenty years, renowned companies have been pioneering individual aspects of the circular economy. Within the scope of this project, they will use interdisciplinary research to show under which economic, legal, political, ecological and technical conditions a sustainable economy in the form of a circular economy can be both ecologically beneficial and economically profitable for companies.”
- 200 For instance: waste hierarchy – avoidance – limitation – recovery – national treatment [see art. 40 EPA], polluter-pays [art. 2 EPA], “integrated” assessment of effects [see art. 8 EPA].
- 201 For instance: sustainable development [art. 2 al. 2 Cst. and 73 Cst.] and long-term preservation of resources [art. 2 al. 4 Cst. and 74 Cst.].
- 202 Bundesrat Postulates 17.3505, 2020.
- 203 Bundesrat Postulates 17.3505, 2020.
- 204 Swiss Fintech Innovations, 2019.
- 205 Under the Paris Climate Convention, Switzerland has committed itself to halving its greenhouse gas emissions by 2030 compared to 1990 levels. Based on the new scientific findings of the Intergovernmental Panel on Climate Change, the Federal Council decided at its meeting on 28 August 2019 to tighten this target: From the year 2050 onwards, Switzerland should, on balance, no longer emit greenhouse gases. This is in line with the internationally agreed goal of limiting global warming to a maximum of 1.5°C compared with the pre-industrial era.
- 206 Zink & Geyer, 2017.
- 207 Based on the Rapid Circularity Assessment developed by Nancy Bocken (University of Cambridge, DELFT University of Technology, University of Maastricht), Karen Miller (University of Brighton) and Steve Evans (University of Cambridge).

References

ABN Amro, ING, Rabobank, 2018a. Circular Economy Finance Guidelines. Available at <https://www.rabobank.com/en/images/circular-economy-finance-guidelines-secure-july-2018.pdf> (Accessed 14 August 2020).

ABN Amro, ING, Rabobank, 2018b. ABN AMRO, ING and Rabobank launch finance guidelines for circular economy. Available at <https://www.ing.com/Newsroom/News/ABN-AMRO-ING-and-Rabobank-launch-finance-guidelines-for-circular-economy.htm> (Accessed 14 August 2020).

Alig, M., Frischknecht, R., Nathani, C., Hellmüller, P., Stolz, P., 2019. Umweltatlas Lieferketten Schweiz. Treeze Ltd. & Rütter Soceco AG. Uster & Rüschlikon.

Allwood, J. M., 2014. Squaring the circular economy: the role of recycling within a hierarchy of material management strategies. In Worrell E. & Reuter M.A. eds. Handbook of Recycling (pages. 445–477). Boston, MA: Elsevier.

Allwood, J. M., 2018. Unrealistic techno-optimism is holding back progress on resource efficiency. Nature materials, 17(12), 1050.

“Anthropocene.” Merriam-Webster.com Dictionary, Merriam-Webster, <https://www.merriam-webster.com/dictionary/Antropocene> (Accessed 18 Sep. 2020).

Bakker, C., Wang, F., Huisman, J., and Den Hollander, M., 2014. Products that go round: exploring product life extension through design. Journal of Cleaner Production, 69, 10–16.

Beretta, C., 2018: Environmental Assessment of Food Losses and Reduction Potential in Food Value Chains. ETH Zurich, Institute of Environmental Engineering, Ecological Systems Design. DISS. ETH no. 25648. ISBN: 978-3-906916-64-4, DOI.

Beretta, C. & Hellweg, S., 2019. Lebensmittelverluste in der Schweiz: Mengen und Umweltbelastung. Wissenschaftlicher Schlussbericht, October 2019. ETH Zurich. (www.bafu.admin.ch/lebensmittelabfalle)

Bundesrat, 2020. Ständerat Beat Vonlanthen, Bericht des Bundesrates vom 19. Juni 2020 in Erfüllung des Postulates 17.3505 "Die Chancen der Kreislaufwirtschaft nutzen. Prüfung steuerlicher Anreize und weiterer Massnahmen" vom 15. Juni 2017 (2020). Available at: <https://www.parlament.ch/centers/eparl/curia/2017/20173505/Bericht%20D.pdf>. (Accessed September 2020).

Bundesrat, 2014. Bericht des Bundesrates in Erfüllung des Postulates 12.3777 "Optimierung der Lebens- und Nutzungsdauer von Produkten" der Grünen Fraktion vom 25. September 2012. Available at: <https://www.parlament.ch/centers/eparl/curia/2012/20123777/Bericht%20BR%20D.pdf> (Accessed: November 2020).

BNP Paribas, 2017. Usage Economy: Join the Revolution. Available at <https://leasingsolutions.bnpparibas.com/en/vision/#> (Accessed 8 November 2020).

Bocken, N. M., De Pauw, I., Bakker, C., and Van Der Grinten, B., 2016a. Product design and business model strategies for a circular economy. Journal of Industrial and Production Engineering, 33(5), 308-320.

Bocken, N.M.P., 2020. Circular Economy: Slowing resource flows and increasing value. In: Circular Economy in the European Union. Ed.: S. Eisenriegler. Switzerland: Springer Nature.

Bocken, N. M. P., 2018. Sustainable consumption through new business models: The role of sustainable entrepreneurship 1. In Sustainable Entrepreneurship (pp. 99-116). Routledge.

Bocken, N. Miller, K., and Evans, S. 2016b. Assessing the environmental impact of new Circular business models. Available at: https://www.researchgate.net/publication/305264490_Assessing_the_environmental_impact_of_new_Circular_business_models (Accessed: June 2020).

BlueDot. UNIGE, EA, UNEP, 2015. Environmental Footprint of nations: national performances and global priorities based on the Planetary Boundaries. Available at: <http://bluedot.world/> (Accessed October 2020).

Braungart, M., McDonough, W., & Bollinger, A., 2007. Cradle-to-cradle design: creating healthy emissions – a strategy for eco-effective product and system design. Journal of cleaner production, 15(13-14), 1337-1348

Brundtland, G. 1987. Our Common Future from One Earth to One World. World Commission on Environment and Development (WCED).

Brunner, D., 2020. Vers une economie circulaire des emballages de boissons en verre en Suisse – limites et apports du cadre reglementaire, Droit de l'environnement en pratique (DEP/URP), no. 4

Brunner, C. & Marxt, C., 2013. Analysing and improving the national innovation system of highly developed countries — The case of Switzerland. Science Direct. Available at : <https://www.sciencedirect.com/science/article/abs/pii/S0040162512001771>. (Accessed: July 2020).

Circle Economy, 2020. The Circularity Gap Report 2020. Available at <https://www.circularity-gap.world/2020> (Accessed 15 September 2020).

DECALIA Asset Management, 2018. DECALIA launches the first equity fund dedicated to the circular economy. Available at <https://www.decaliagroup.com/wp/wp-content/uploads/2018/06/2018.06.26-CdP-Lancement-fonds-Economie-circulaire-ENG.pdf> (Accessed 15 September 2020).

Desing, H., Brunner, D., Takacs, F., Nahrath, S., Frankenberger, K., & Hischier, R., 2020. A circular economy within the planetary boundaries: Towards a resource-based, systemic approach. Resources, Conservation and Recycling, 155, 104673. Available at: <https://doi.org/10.1016/j.resconrec.2019.104673> (Accessed: August 2020).

Desing, H., Braun, G., Hischier, R., 2020. Resource pressure – A circular design method. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344920304961?via%3Dihub> (Accessed: November 2020).

Dutch Ministry of Infrastructure and Water Management, 2019. Circular Economy Implementation Programme 2019-2023. Available at <https://hollandcircularhotspot.nl/wp-content/uploads/2019/09/Circular-Economy-Implementation-Programme-2019-2023.pdf> (Accessed 14 August 2020).

Ellen MacArthur Foundation, 2020. Financing the circular economy – Capturing the opportunity. Available at <https://www.ellenmacarthurfoundation.org/assets/downloads/Financing-the-circular-economy.pdf> (Accessed 15 September 2020).

Ellen MacArthur Foundation, 2013. Towards the Circular Economy – Economic and business rationale for an accelerated transition. Available at <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf> (Accessed 14 August 2020).

Ellen MacArthur Foundation, SUN, McKinsey & Co, 2015. Growth Within: a circular economy vision for a competitive Europe. Available at https://www.ellenmacarthurfoundation.org/assets/downloads/publications/EllenMacArthurFoundation_Growth-Within_July15.pdf (Accessed 14 August 2020).

European Environment Agency, 2019. Resource efficiency and the circular economy in Europe 2019 – even more from less. An overview of the policies, approaches and targets of 32 European countries. Available at: <file:///C:/Users/PMA/Downloads/26%202019%20Resource%20efficiency%202019%20TH-AL-20-007-EN-N.pdf> (Accessed: November 2020).

Environmental Performance Index, Switzerland. Available at: <https://epi.yale.edu/epi-country-report/CHE>. Accessed: 19 September 2020.

European Circular Economy Stakeholder Platform, 2019. A French act of law against waste and for a circular economy. Available at <https://circulareconomy.europa.eu/platform/en/strategies/french-act-law-against-waste-and-circular-economy> (Accessed 14 August 2020).

European Commission, 2020. The European Green Deal Investment Plan and Just Transition Mechanism explained. Available at: https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_24. (Accessed: September 2020).

European Commission, 2020a. Circular Economy Action Plan – A new Circular Economy Action Plan for a cleaner and more competitive Europe. Available at <https://ec.europa.eu/environment/circular-economy/> (Accessed 14 August 2020).

European Commission, 2020b. A new Circular Economy Action Plan – For a cleaner and more competitive Europe. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Available at https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0017.02/DOC_1&format=PDF (Accessed 14 August 2020).

European Commission, 2019a. Accelerating the transition to the circular economy - Improving access to finance for circular economy projects. Available at https://ec.europa.eu/info/sites/info/files/research_and_innovation/knowledge_publications_tools_and_data/documents/accelerating_circular_economy_032019.pdf- (Accessed 14 August 2020).

European Commission, 2019b. Report on the implementation of the Circular Economy Action Plan. Report from the

Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Available at https://ec.europa.eu/commission/sites/beta-political/files/report_implementation_circular_economy_action_plan.pdf (Accessed 14 August 2020).

European Commission, 2015. Closing the loop - An EU action plan for the Circular Economy. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Available at https://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF (Accessed 14 August 2020).

European Commission, 2014. Ecodesign Your Future – How Ecodesign can help the environment by making products smarter. Available at: <https://op.europa.eu/en/publication-detail/-/publication/4d42d597-4f92-4498-8e1d-857cc157e6db> (Accessed 16 October 2020).

European Commission 2009. Directive 2009/125/ec of the European Parliament and of the Council. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0125> (Accessed: 04 November 2020).

European Environment Bureau. 2019. Cool products don't cost the earth. Available at: <https://eeb.org/revealed-the-climate-cost-of-disposable-smartphones/> (Accessed 28 July 2020).

European Federation of Pharmaceutical Industries and Associations. (2020). EFPIA White Paper on Circular Economy. Available at <https://www.efpia.eu/media/554663/circular-economy.pdf> (Accessed 15 September 2020).

European Investment Bank. 2020. The EIB Circular Economy Guide – Supporting the circular transition. Available at https://www.eib.org/attachments/thematic/circular_economy_guide_en.pdf (Accessed 14 August 2020).

European Parliament, 2017. Making consumer products more durable and easier to repair. Available at: <http://www.europarl.europa.eu/news/en/press-room/20170629IPR78633/making-consumer-products-more-durable-and-easier-to-repair> (Accessed 12 November 2019).

Erläuternder Bericht zur Volksinitiative «Für ein gesundes Klima (Gletscher-Initiative)» und zum direkten Gegenentwurf (Bundesbeschluss über die Klimapolitik) (September 2020). Available at: <https://www.news.admin.ch/newsd/message/attachments/62709.pdf> (Accessed September 2020).

Federal Office for the Environment FOEN (BAFU), 2020. Material footprint per person – Raw material consumption (RMC) per person. Available at: <https://www.bfs.admin.ch/bfs/en/home/statistics/sustainable-development/monet-2030/spillover-responsibilities/material-footprint-person.assetdetail.13428413.html> (Accessed 16 October 2020).

Federal Office for the Environment FOEN (BAFU), 2018. Environment Switzerland 2018 Report of the Federal Council. Available at: https://www.bafu.admin.ch/dam/bafu/en/dokumente/allgemein/uz-umwelt-zustand/umwelt-schweiz-2018.pdf.download.pdf/Umweltbericht2018_E.pdf (Accessed 07 October 2020).

Federal Office for the Environment FOEN (BAFU), 2018a. Economy and Consumption: In Brief. Available at <https://www.bafu.admin.ch/bafu/en/home/topics/economy-consumption/in-brief.html> (Accessed 14 August 2020).

Federal Office for the Environment FOEN (BAFU), 2018b. Waste and raw materials: In brief. Available at <https://www.bafu.admin.ch/bafu/en/home/topics/waste/in-brief.html> (Accessed 14 August 2020).

Federal Office for the Environment FOEN (BAFU), 2016. Bericht Module 3 + 4 Verwertung Kunststoffabfälle Schweiz im Auftrag des Runden Tisches Kunststoff unter der Leitung des BAFU mit Stellungnahmen der Mitglieder des Projektausschusses Runder Tisch Kunststoff. Available at http://www.swissrecycling.ch/fileadmin/rd/pdf/wissen/fachbetaeage_studien/Studien/16-12-05_Bericht_Module_3_4.pdf (Accessed 14 August 2020).

Federal Office for the Environment FOEN (BAFU), 2013. Okofaktoren Schweiz 2013 gemäss der Methode der ökologischen Knappheit. Available at <https://www.bafu.admin.ch/bafu/de/home/themen/wirtschaft-konsum/publikationen-studien/publikationen/oekofaktoren-2015-knappheit.html> (Accessed 18 July 2020).

FinanCE Working Group, 2018. Linear Risks. Available at https://assets.website-files.com/5d26d80e8836af2d12ed1269/5de8eff3bbf4da023e254ea4_FINAL-linear-risk-20180613.pdf (Accessed 14 August 2020).

FinanCE Working Group, 2016. Money makes the world go round (and will it help to make the economy circular as well?). Available at <https://www.ellenmacarthurfoundation.org/assets/downloads/ce100/FinanCE.pdf> (Accessed 14 August 2020).

Frischknecht, R., Nathani, C., Alig, M., Stolz, P., Tschümperlin, L., and Hellmüller, P., 2018. Environmental Footprints of

Switzerland. Developments from 1996 to 2015. Extended summary. Bern: Federal Office for the Environment. State of the environment no. 1811: 21 p.

Federal Statistics Office, 2020. Material flow accounts: Statistics first contribution to measuring the circular economy. Available at: <https://www.bfs.admin.ch/bfs/en/home.assetdetail.13487975.html>. (Accessed: September 2020).

Feldges, D., 2019. Der vermeintliche «Recycling-Weltmeister» Schweiz schneidet bei Plastikabfällen schlecht ab. Neue Zürcher Zeitung (NZZ). <https://www.nzz.ch/wirtschaft/der-vermeintliche-recycling-weltmeister-schweiz-schneidet-bei-plastikabfaellen-schlecht-ab-ld.1528742?reduced=true> (Accessed 31 August 2020).

Global Performance Index. Switzerland. Available at: <https://www.globalinnovationindex.org/analysis-economy>. (Accessed: 19 September 2020).

Government of the Netherlands. (n.d.). Accelerating the transition to a circular economy. Available at <https://www.government.nl/topics/circular-economy/accelerating-the-transition-to-a-circular-economy> (Accessed 14 August 2020).

Haupt, M., Hellweg, S., 2019. Measuring the environmental sustainability of a circular economy. Science Direct. Available at: <https://www.sciencedirect.com/science/article/pii/S2665972719300054?via%3Dihub> (Accessed 18 September 2020).

Hoi-Na Wong, S., 2018. Bloomberg. Watches & Gadgets: Trade in a Luxury Watch Like a BMW: It's a Booming Business. Available at: <https://www.bloomberg.com/news/articles/2018-02-16/trade-in-a-luxury-watch-like-a-bmw-it-s-a-booming-business> (Accessed July 2020).

H2 Mobility Switzerland Association, 2020. Hydrogen-electric mobility in Switzerland on the verge of a breakthrough. Available at: <https://h2energy.ch/en/hydrogen-electric-mobility-in-switzerland-on-the-verge-of-a-breakthrough/> (Accessed August 2020).

ING., 2020. Mehr Bewusstsein für Klima und Umwelt durch Corona? | 10.08.2020. ING-Studie: Corona und Nachhaltigkeit. Available at: <https://www.ing.de/ueber-uns/wissenswert/corona-nachhaltigkeit/> (Accessed 03 September 2020).

International Monetary Fund. Per Capita GDP, 2019. Available at: [https://en.wikipedia.org/wiki/List_of_countries_by_GDP_\(PPP\)_per_capita](https://en.wikipedia.org/wiki/List_of_countries_by_GDP_(PPP)_per_capita). (Accessed: 19 September 2020).

Johnson & Johnson, 2017. Earthwards®: The Unique Johnson & Johnson Program That's Helping to Create a More Sustainable World. Available at <https://www.jnj.com/innovation/earthwards-a-johnson-and-johnson-program-helping-create-a-more-sustainable-world> (Accessed 15 September 2020).

Konietzko, J., Bocken, N., & Hultink, E. J., 2020. A Tool to analyze, ideate and develop circular innovation ecosystems. Sustainability, 12(1), 417.

Krozer, J., & Doelman, P., 2003. Policy incentives for waste prevention. An economic approach to design for recycling. The Journal of Sustainable Product Design, 3(1-2), 3-17.

Lüdeke-Freund, F., Gold, S., & Bocken, N. M., 2019. A review and typology of circular economy business model patterns. Journal of Industrial Ecology, 23(1), 36-61.

McDonough, W., & Braungart, M., 2010. Cradle to cradle: Remaking the way we make things. North point press.

Moussu, N., 2020. Sanu durabilitas. A Promising Step towards Circular Economy in Switzerland. <https://www.cetransition.ch/en/news/a-promising-step-towards-circular-economy-in-switzerland> (Accessed August 2020).

Myers, J., 2020. World Economic Forum. These are the world's most innovative economies. <https://www.weforum.org/agenda/2020/09/these-are-the-worlds-most-innovative-economies/>. (Accessed 16 September 2020).

McKinsey, 2020. Climate risk and response: Physical hazards and socioeconomic impacts | 16 January 2020 | Report. Available at: <https://www.mckinsey.com/business-functions/sustainability/our-insights/climate-risk-and-response-physical-hazards-and-socioeconomic-impacts#>. (Accessed: September 2020).

OECD. Ease of doing business index. Switzerland. Available at : <https://www.doingbusiness.org/content/dam/doing-business/country/s/switzerland/CHE.pdf>. (Accessed 19 September 2020).

OECD., 2018. Global Material Resources Outlook to 2060 Economic drivers and environmental consequences: Highlights. Available at: <https://www.oecd.org/environment/waste/highlights-global-material-resources-outlook-to-2060.pdf> (Accessed October 2020).

Parlamentarische Initiative 20. 433 "Schweizer Kreislaufwirtschaft stärken" 19.05.2020. Available at: <https://www.parlament.ch/de/ratsbetrieb/suche-curia-vista/geschaefte?AffairId=20200433> (Accessed: September 2020).

Perrot., O., Friat- Massard., M., 2020. Salza, Matériuum. Wiederverwendung Bauen: Aktuelle Situation und Perspektiven: Der Fahrplan. Im Auftrag des Bundesamtes für Umwelt BAFU. Available at: <https://materium.ch/wp/wp-content/uploads/Wiederverwendung-Bauen-2020.pdf> (Accessed August 2020).

PwC, 2020. Climate change and Resource scarcity. #Megatrends. Available at: <https://www.pwc.co.uk/issues/megatrends/climate-change-and-resource-scarcity.html> (Accessed: 20 September 2020).

PwC, 2019. The road to circularity – Why a circular economy is becoming the new normal. Available at <https://www.pwc.de/de/nachhaltigkeit/pwc-circular-economy-study-2019.pdf> (Accessed 14 August 2020).

Salvatori, G., Holstein, F., Böhme, K., 2019. Circular economy strategies and roadmaps in Europe: Identifying synergies and the potential for cooperation and alliance building. The European Economic and Social Committee (EESC). Available at: <https://www.eesc.europa.eu/sites/default/files/files/qe-01-19-425-en-n.pdf> (Accessed 31 August 2020).

Stahel, W. R., 2010. The performance economy, Palgrave Macmillan Hampshire, UK.

Stahel, W. R., 1994. "The utilization focused service economy: Resource efficiency," in B. R. Allenby and D., J. Richards (eds), The Greening of Industrial Ecosystems, National Academy Press, Washington, DC, 178– 190 (1994).

Swiss FinTech Innovations, 2019. Properly regulating FinTech – 10 principles. Available at <https://swissfintechinnovations.ch/wp-content/uploads/2019/03/Broschu%CC%88re-10-Prinzipien-FinTech-Regulation-E-8428075.pdf> (Accessed 14 August 2020).

Swiss Sustainable Finance (SSF); the Center for Sustainable Finance and Private Wealth (CSP), 2020. Swiss Sustainable Investment Market Study 2020. Available at: https://www.sustainablefinance.ch/upload/cms/user/2020_06_08_SSF_Swiss_Sustainable_Investment_Market_Study_2020_E_final_Screen.pdf (Accessed: September 2020).

Symbiosis Center Denmark. (n.d.). About us. Available at <https://symbiosecenter.dk/en/about-us/> (Accessed 15 September 2020).

The Local, 2018. France to toughen stance on planned obsolescence of goods. Available at: <https://www.thelocal.fr/20180216/france-muses-whether-to-expose-the-true-lifespan-of-goods-and-appliances> (Accessed: November 2020).

Wijkman, A., & Skånberg, K., 2015. The circular economy and benefits for society. Club of Rome. Available at <https://clubofrome.org/publication/the-circular-economy-and-benefits-for-society/> (Accessed 14 August 2020).

World Health Organization (WHO), 2016. An estimated 12.6 million deaths each year are attributable to unhealthy environments. Available at <https://www.who.int/news-room/detail/15-03-2016-an-estimated-12-6-million-deaths-each-year-are-attributable-to-unhealthy-environments> (Accessed 15 September 2020).

WWF, 2020. Living Planet Report 2020. Available at: <https://f.hubspotusercontent20.net/hubfs/4783129/LPR/PDFs/EN-GLISH-FULL.pdf> (Accessed: 20 September 2020).

WWF & PwC, 2020. Leading the way to a green and resilient economy - A Swiss-quality approach to sustainable finance. Available at https://www.wwf.ch/sites/default/files/doc-2020-08/Leading%20the%20way%20to%20a%20green%20and%20resilient%20economy_EN-web.pdf (Accessed: 8 November 2020).



Annex

Designing and measuring circular economy

Rapid circularity assessment

A key component of this white paper is to introduce a set of guiding principles which businesses can refer to when designing new circular business models to achieve a sustainable outcome. While the four resource loop strategies – slowing, closing, narrowing and regenerating – regroup the company-level approaches for circular business models, it’s important to examine these strategies in the broader context of the systemic and life cycle effects to achieve the greatest environmental impact (Bocken et al., 2016). The proposed set of guiding principles below is based on the rapid circularity assessment (RCA) method. It’s developed from the fundamental ‘circularity strategies’ described in literature (Stahel, 1994, p. 179; 2010; Bocken et al., 2016b; Konietzko, 2020).

Slowing, closing and regenerating the loops described are considered to be the most important in the high-level strategies to design for sustainable

circular business models (Stahel, 1994; Bocken et al., 2016a; Konietzko, 2020) as narrowing loops and efficiencies are already common in the current ‘linear’ economy. Slowing effects strive to extend product life and moderate consumption of new goods, while closing effects promote the recycling of products post-consumer use and regenerating effects facilitate cleaner production of goods, with the aim of leaving the environment in a better state than it was found (Bocken et al, 2020; Konietzko, 2020). By contrast, life cycle effects capture the effects created throughout the product’s life, starting from raw material extraction and procurement through to materials processing, manufacture, distribution and use phase, culminating with its disposal. It’s derived from the Life Cycle Assessment (LCA) perspective (ISO 14044, 2006). Finally, the system effects of the RCA principles seek to integrate a birds-eye view of the system in which the business is operating, for instance, by considering “the flows of a material in an economic system” (Kytzua et al., 2004) (Bocken et al., 2016b).

To test the initial environmental viability of a new circular business model, businesses can apply the following

design parameters during the conceptual phase of a new endeavour to get an early indication of whether the circular endeavour is likely to have an environmentally beneficial impact.

Note that each principle should be examined from two angles. The first is the flow of goods from a company, for instance the number of items it sells annually. The second refers to the total stocks of a specific good in a country or the number of goods owned by a single person, e.g. the average number of clothes owned by every Swiss citizen or the total number of clothes in Switzerland overall. These two perspectives enable an organisation to design at company level while taking into account its impact on the broader national or global context.

For each of the principles discussed next, the business should calculate the estimated reduction in waste or other environmental factors and indicate their level of confidence with the estimated impact. On this basis, the circular business can integrate their environmental impact at the very beginning of the process.²⁰⁷

Rapid Circularity Assessment Design Principles

	Flows (number of items sold annually by company: influx of NEW products)	Stocks (number of goods nationally or number of goods per person nationally: products ALREADY IN USE)
Slowing effects (long-lasting products and extending product life, slowing consumption)	Design to 1. extend the useful lifetime of existing or new products 2. reduce total new items produced	Design to 1. reduce total items in the country 2. increase the total number of goods given away for reuse (e.g. second-hand markets) 3. reverse overall trends of total goods going to landfill (e.g. by repurposing the materials and increasing recycling rates)
Closing effects (recycling)	Design for 1. increased recyclability of a new product 2. increased recycling rates for new goods	Design for 1. increased recyclability of existing products 2. increased recycling rates for existing goods
Regenerating effects (cleaner production, renewable inputs, no toxic substances, net- positive strategies)	Design for 1. increasing positive impact on the environment, such as increasing biodiversity, for new products and services 2. increasing positive impact on society, such as improved education and health, for new products and services	Design for 1. increasing positive impact on the environment, such as increasing biodiversity of products and services already in use 2. increasing positive impact on society, such as improved education and health of products and services already in use
Life cycle effects (effects across raw material sourcing, production, transport, use and disposal – not yet captured)	Design for 1. efficiencies (e.g. less material per product) 2. manufacturing efficiencies throughout the production chain 3. transport savings 4. more efficient or less cleaning 5. cleaner forms of recycling 6. efficiencies not yet captured	Design for 7. transportation savings in the handling of current goods in the country 8. increase the total number of goods given away for recycling 9. to reverse overall trends of total goods going to landfill (e.g. by repurposing the materials and increasing recycling rates)
System effects (wider impacts of the innovation)	Key questions to consider: 1. Does it lead to negative rebound effects (e.g. consuming more) or positive ones (e.g. from fast to slow fashion)? 2. Are there any unintended consequences by upcycling the value of waste? 3. Does it lead to radical changes for stores and employees? What are the impacts on those stakeholders and others? Who are the winners/losers? 4. What is the effect of multiple co-existing business models? 5. What the does this innovation have on society? 6. What is required for other companies to follow – is that considered in this new business model?	



Food Sector Cases

1. Chocolat Halba
2. Growcer
3. Kitro
4. Too good to go

Case study

Chocolats Halba / Sunray Cocoa Shell Upcycling

Industry/sector:

Chocolate and snacks

What is it?

In chocolate production, one tonne of processed cocoa beans generates around 130 kg of the by-product cocoa shell. As an integrated approach, not only are the cocoa nibs used to process chocolate, but the cocoa shell is predestined for further use. Reuse of the cocoa shell – with its highly nutritious ingredients like theobromine and its distinct chocolate aroma – as organic tea is the most valuable use.

Why is this important?

In Switzerland, 2.6 million tonnes of food waste (weighed in fresh substances) are generated each year, of which 27% is caused in food processing. Food which doesn't get consumed implicates unnecessary CO₂ emissions, loss of biodiversity and land and water consumption (BAFU, 2019).

Main resource strategy:

Closing the resource loop by reusing the cocoa shell as a tea.

Business model strategies:

The cocoa shell as a by-product in the production process is used in an industrial symbiosis and gets upcycled as organic cocoa tea.

Sources:

Federal Office for the Environment (FOEN, 25.10.2019. Food waste <https://www.bafu.admin.ch/bafu/en/home/topics/waste/guide-to-waste-a-z/biodegradable-waste/types-of-waste/lebensmittelabfaelle.html>
Coop, 2020. Karma Bio Tee Chocolate Spice 20 Beutel https://www.coop.ch/de/lebensmittel/getraenke/heisse-getraenke/tee/tee-mischungen/karma-bio-tee-chocolate-spice-20-beutel/p/6161356?gs=1&gclid=EALaQobChMIgbzc8diu7AIVRh-N7Ch0GKwGmEAQYAIAABEgLIzVD_BwE&gclidsrc=aw.ds

Case study

Growcer is a technology company enabling sustainable, efficient vertical farming.

Industry/sector:

Technology for vertical farming.

What is it?

Local, consistent food production using less resources.

Why is this important?

More than 50% of fresh produce in Switzerland is being imported – a vast amount is transported by air. Instead of being grown to meet standards for consumption, the products are grown to meet standards for transportation. Worse still, when the food arrives, about 30% is wasted during transport to the consumer and on shelves. To grow outdoors and

assure sufficient yield, pesticides and supplemental irrigation are mandatory. Intensified use of land disturbs the soil diversity.

Main resource strategy:

Narrowing loops by using less resources per product. With the company's efficient farming system, Growcer is enabling a significant lower water usage by using 90% less water. Due to the complete controlled environment, chemical pesticides are no longer needed. Direct transport routes and daily harvesting allow up to three times longer shelf-life, increasing freshness and nutritional value while reducing food waste. By applying automation, a variety of resources including consumables and hardware are saved. The reduction of transport to a minimum and the use of energy from renewable sources

lead to a significant lower CO₂ footprint compared to greenhouses. Due to optimised growing conditions, up to twice as much yield can be achieved for many crops compared to open fields. The Growcer farms can even run off-grid by using solar panels and water recycling. To sum it up, the farms are using water and energy to create food close to the consumer.

Business model strategies:

One-time expenses for setting up the farm and recurring expenses based on kilos of produce leaving the farm. The farm is based on a franchise model and serviced to the franchisees.

Source:

<https://growcer.com>

Case study

KITRO – Tackling food waste in commercial kitchens

Industry/Sector:

Waste management (food and beverage industry)

What is it?

KITRO strives to bring back the value of food, so it's appreciated and not wasted. With its first product in development, KITRO is targeting the food and beverage industry by giving users an automated solution to measure and mitigate food waste. The goal is to prevent unnecessary waste through long-term data collection and optimised operational practices. In addition to the detailed analysis, KITRO also offers a service to make sure customers are empowered to achieve the highest possible savings in terms of food waste and cost, resulting in a lower CO₂ footprint.

Why is this important?

The issue of food waste is out of hand with one third of all food pro-

duced for human consumption being lost or wasted every year, resulting in enormous economic, social and environmental costs. In the EU alone, around 88 million tonnes of food are wasted every year, this is equivalent to >170 million tonnes of CO₂. The food industry is responsible for 26% of the global greenhouse gas emissions, 6% of this is a result of food that is never eaten and ends as waste. So, it's critical to start collecting data and develop solutions to tackle this issue.

Main resource strategy:

Measuring and monitoring food waste in order to provide data to tackle operational inefficiencies and drive change. Data-driven action that reduces food waste. In essence, KITRO helps to slow resource loops by giving chefs, cafeterias and other food and beverage actors a way to understand and change their food offering to reduce food waste.

Other resource strategies:

Not only is food waste a huge environmental problem in terms of CO₂

emissions, it also impacts many other resources like land usage, water, energy and labour that are needed to produce food.

Business model strategies:

Targeting >500,000 commercial kitchens, revenues are generated through a subscription-based model of CHF 484/month. Customers can either buy or lease the hardware and additionally pay a monthly subscription fee for their own personal dashboard.

Sources:

<https://www.kitro.ch/>
<https://www.youtube.com/watch?v=LtExQkYjGY0>
<https://www.weforum.org/agenda/2020/01/ai-bin-trash-food-waste-davos-2020/>
<https://www.moneycab.com/startups/kitro-schweizer-start-up-gegen-food-waste/>

Case study

Too Good To Go

Industry/Sector:

Food waste/circular economy

What is it?

Too Good To Go is a social impact company whose mission is to both empower and inspire everybody to fight food waste together. The company's app is now the world's largest B2C marketplace for surplus food. It empowers people to fight food waste, by connecting users with businesses that have surplus food, so that this food can be enjoyed instead of wasted. Users get delicious meals at a great price, businesses reach new customers and recover sunk costs, and the planet has less wasted food to deal with – it's a win-win situation for all. Through the Movement Against Food Waste, Too Good To Go also wants to inspire people and bring back respect for how food is produced, treated and consumed. The company wants to achieve a real

change in the mindsets of people at home, students in schools, businesses and policy-makers.

Why is this important?

Each year, 1.3 billion tonnes of edible food is wasted, which is equivalent to one-third of all food produced. This wasted food has an enormous impact on climate change, given the wasted resources and energy that went into producing it. According to the FAO, food waste is responsible for 8% of global greenhouse gas emissions. In fact, if food waste were a country, it would be the third greatest emitter in the world after the US and China.

Main resource strategy:

Closing, as Too Good To Go makes sure that food that would otherwise have been wasted is actually consumed.

Other resource strategies:

Slowing and narrowing, in the long-term, as actual consumption of food should lead to a reduction in the

current over-production of food, and in turn lead to a decreased use of resources required to produce food.

Business model strategies:

Extending the product life cycle, avoiding waste: The company's app is an easy concept by which Too Good To Go empowers consumers to save meals from stores around them. By saving meals, it is ensured that all food produced is food consumed – and ultimately less food will need to be produced. You not only save the actual food in front of you but also the valuable associated resources like the land it took to produce it, the energy it took to transport it or the water it took to irrigate. As food travels along the supply chain, it uses up resources and, in the process, emits a significant amount of greenhouse gases.

Sources:

<https://toogoodtogo.org/en/press>
<http://www.fao.org/3/a-bb144e.pdf>

Textile cases

1. wear2wear™
2. PurFi/UPSET textiles
3. SHAREaLOOK – Fashion Sharing Community
4. Stotz & Co AG

Case study

wear2wear™

Industry/sector:

Clothing (leisure, fashion and personal protective equipment)

What is it?

wear2wear™ is an innovative partnership between companies that have committed to running their businesses in a sustainable and environmentally-friendly manner. Each partner makes an individual contribution to the closed textile loop.

Why is this important?

The sustainable wear2wear™ concept is synonymous with high-quality, responsible clothing. New functional apparel is manufactured with the most current production systems using recycled PET textiles from across Europe. Depending on the field of ap-

plication, the functional textiles meet high standards and requirements for waterproofness, breathability, protection and comfort. To make sure the raw material loop closes, these textiles can be completely recycled again at the end of their life cycle. The advantage: no waste is created and the textiles can be further utilised to manufacture new, upcycled apparel products.

Main resource strategy:

Closing the textile loop.

Behind wear2wear™ are renowned European companies that have taken on the task of manufacturing new textiles solely from recyclable and single-origin materials. Each company makes an individual contribution in a specific phase of the textile recycling process. Other resource strategies: A textile can pass through

three cycles until the polymer can no longer recirculate. A life cycle analysis has been carried out to demonstrate sustainable management with the three cycles (Empa, 2020).

Business model strategies:

Industrial symbiosis, peer-to-peer, take-back incentives, cleaner renewable models, regenerative/net-positive and premium/lifelong service models.

Sources:

www.wear2wear.org,
<http://www.nfp73.ch/en/News/Pages/200312-news-nfp73-innovative-business-models-for-a-sustainable-circular-economy.aspx> (Publication of PhD-candidate Fabian Takacs, HSG St Gallen)

Case study

PurFi/UPSET textiles

Industry/sector:

Textiles

What is it?

An innovation for rejuvenating non-wearable textile waste. New and fully patented technique to upcycle cotton textiles waste into new fibres, comparable in quality and price to virgin materials. In combination with a closed loop customer approach with a brand playing two roles: as a supplier of waste and as a customer for recycled fibres/yarns (after rejuvenation).

Why is this important?

Textiles is one the largest and most polluting industries in the world. Peo-

ple consume and dispose of huge quantities of textiles/fashion every year. Only a mere 1% of total textile waste is currently upcycled, mainly due to technical and financial reasons. This is a true waste of potential and an unnecessary assault on the environment.

Main resource strategy:

Closing resource loops of precious raw materials in the textile value chain.

Development strategy: Starting with the use of big volumes of post-production waste and gradually in time mixing with post-consumer waste. The waste comes from general international or local markets. Other resource strategies: Dedicated 'closing the loop' programmes (e.g. 360°

arrangements with (retail) brands/workwear/professional laundry).

Business model strategies:

PurFi/UPSET's preferred business model is a 360° arrangement with selected (retail) brands. Gathering waste from and supplying recycled fibres/yarns to the brand, in one long-term (price) agreement based on transparency from the PurFi's/UPSETs side as well as the brand, concerning product, pricing and (social and environmental) production conditions.

Sources:

<https://www.purfiglobal.com>
<https://www.upsetttextiles.com>
<https://www.ellenmacarthurfoundation.org/our-work/activities/make-fashion-circular/report>

Case study

SHAREaLOOK – Fashion Sharing Community

Industry/sector:

Clothing, jewellery, bags, shoes

What is it?

SHAREaLOOK is a peer-to-peer and brand-to-peer fashion sharing platform and retailer. Individual users as well as designers and brands can offer their fashion items for rent, swap or resale.

Why is this important?

Fashion purchases have tripled in the last 20 years, while active use has halved. Three-fifths of all clothing ends up in landfill within one year. People have a wardrobe full of clothing but 'nothing to wear'. This is an alarming market behaviour considering that fashion production makes up 10% of humanity's carbon emissions, dries up water sources, and pollutes rivers and streams.

Main resource strategy:

SHAREaLOOK's focus is on slowing resource loops. To support the transition towards a more sustainable, circular economy SHAREaLOOK starts with the consumer. Changing the way people perceive and treat fashion goods will have a big impact, not only on the environment but also on

consumption patterns and will play a major role in making the industry shift from 'take, make and dispose' to 'use, reuse and repurpose'. In the longer term SHAREaLOOK will help the industry transfer to circular methods offering 'Data as a Service' as well as 'Software as a Service'.

The aim of the company is to:

Reuse and reduce: increase the product life and usage, while avoiding waste creation.

Connect: better understand user patterns and preferences on fashion re-usage.

Understand: collect data on materials, products and their active (re)use.

Recommend: give recommendations on how to save resources and CO₂ to individual users and brands (SHAREaLOOK Fashion Footprint Tracker).

Repurpose/redistribute: connect different players to repurpose and reallocate resources.

Business model strategies:

SHAREaLOOK has a mixed model consisting of commission fees and memberships.

Online: B2C rental: Users can pay a fee per item per day, or become members and pay CHF 60/month. Members can borrow up to five items per month.

Peer-to-peer rental and thrift:

Users can upload their own looks and offer them for rent. Here SHAREaLOOK takes a 25% commission fee on the user-defined rental price.

Swap: Users pay CHF 10 monthly membership and upload their wardrobe to swap in a closed community of swappers. They can pick five outfits per month. (in test phase).

Offline: B2C rental: Customers pay a fee per day or become members and pay CHF 60/month. Members can borrow up to five items per month.

Peer-to-peer rental and thrift:

SHAREaLOOK takes a 50% commission fee.

Swap: Users pay CHF 10 monthly membership and have the chance to swap up to five items every Saturday.

Sources:

<https://www.sharealook.com/>
<https://www.kleihd.ch/>

Case study

Stotz & Co AG, Recycled cotton programme

Industry/sector:

Clothing and outdoor equipment. Jackets, coats, shoes, hats and caps.

What is it?

Producing yarns and products from pre-consumer recycled cotton.

Why is this important?

These precious cotton fibres were already grown on planet Earth and so they don't require any additional chemistry or water. Their ecological footprint is down to a minimum. Usually, cotton leftovers from weaving and knitting factories are placed in

landfill. Along with suppliers, the company has developed a supply chain that collects leftovers all across the Asian continent, where 70 to 80% of the cotton worldwide is processed. These leftovers are then spun into new yarns and woven into highly-sustainable fabrics.

Finer yarns can't be produced with 100% recycled cotton. This is why Stotz & Co has developed yarns and fabrics using blends of recycled cotton and organic cotton.

Main resource strategy:

Closing resource loops. 100% recycled cotton fabrics close the loop at least for one additional time reusing fostered fibres.

Business model strategies:

No specific business model to mention here. The company is just following its claim:

**Join the Movement
Love the Environment
Choose Slow Fashion**

Sources:

<https://ventile.co.uk/fabric/ventile-eco-range/ventile-eco-recycled/>

GRS Certification:

<https://ventile.co.uk/wp-content/uploads/2020/04/GRS-Transaction-Certificate.pdf>

Watch and jewellery cases

1. Baume
2. Triwa
3. Mondaine

Case study

Baume & Mercier – The BAUME project

Industry/sector:
Watchmaking

What is it?

The BAUME project from BAUME & MERCIER is designed to propose a new watchmaking philosophy. A new vision centred around the use of natural materials and avoiding the use of animal leather and precious stones integrates recycled processes and circular economy through collaborations with NGOs and donations. From product to packaging, everything has been conceived to have the least impact and the best quality for clients while designing for a better tomorrow.

Why is this important?

Similar to the fashion industry, the watchmaking sector needs to rethink its business to play its role in this evolution of the luxury business. If it's not the source of the problem, it must be part of the solution, bearing in mind that the products created today shape the world of tomorrow. From used materials to waste created, from unnecessary production to second hand, Baume & Mercier believes that there are plenty of solutions to put in place to improve the business, while keeping client satisfaction at the centre of what is done.

Main resource strategy:

Creating a collection based on natural, recycled or upcycled materials and establishing partnerships with NGOs like Waste Free Oceans and Seaqual to create, gather and

transform materials before use in production or by other companies designing for a better tomorrow such as PROJECT WREN.

Other resource strategies:

Additionally, closing the loop by sharing a donation of the collection turnover with the same NGOs to help them grow their business and nourish a circular economy approach.

Sources:

<https://www.positiveluxury.com/brand/baume/>
<https://usa.watchpro.com/breaking-news-richemont-bypasses-channel-launch-online-watch-brand-millennials/>
<https://www.seaqual.org/projects/zag-x-baume/>

Case study

TRIWA Time for Oceans

Industry/sector:
Watches and jewellery

What is it?

TRIWA's vision is Time for Change, the new collection Time for Oceans is made entirely from recycled ocean plastic.

Why is this important?

Every year, eight million metric tonnes of plastic enter our oceans – the equivalent of a waste disposal truck load every minute, on top of the esti-

mated 150 million that are currently in circulation. This is having a deep and irreversible impact on marine life and, ultimately, on ourselves. The level of micro plastics we consume is equivalent to one credit card each week.

Main resource strategy:

Making useful products with a long lifespan by recycling the ocean plastic into granulates, through solar energy, and remoulding them into watches.

Other resource strategies:

TRIWA is also making watches from recycled illegal firearms – the

collection is called Time for Peace. For every watch sold, TRIWA donates 15% to victims of armed violence.

Business model strategies:

TRIWA's general strategy is called Time for Change, where it turns the watch into a symbol of change, rather than the classic status symbol. By making it visible with a story, the consumers help to drive change. TRIWA calls this 'stories for your wrist'.

Sources:

www.triwa.com

Case study

Mondaine Watch Ltd, Switzerland – almost 50 years of experience in sustainability with a proven track record (e.g. first solar analogue watches in 1973, 100% post-consumer recycled metal watch cases produced in the early 90's, various straps from alternative materials then leather since 2014, and solar power plant at the swiss factory). The company doesn't produce watches with diamonds and uses only a few grammes of gold per year (PVD-plated cases and bands).

Industry/sector:
Watches

What is it?

LUMINOX, project TIDE: Recycled and upcycled ocean plastic turned into watch cases and watch straps, assembled in the company's state-of-the-art factory in Biberist, Solothurn, where 70-80% of the energy needed each year is produced by the photovoltaic power plant on the roof, installed in 2019. At the end of their life cycle, the watches can be returned to Mondaine for dismantling and the parts are then recycled where possible.

Why is this important?

With 50 or so years of being active in sustainability, the company's constantly introducing new methods, materials and recycling/upcycling old materials. Although the quantity is not significant on a global ecological scale to 'save the Earth', Mondaine can show their consumers and other

industries that much more can be done in terms of sustainability. And if Mondaine can do it, why not others? The company hopes that their initiatives will lead other companies to join and support the endeavour to become better, step by step.

Main resource strategy:

TIDE is an organisation that developed a material from ocean plastic waste, which is collected in Thailand with social responsibility in mind, then transformed with the support of IWK University in Rapperswil into material which can be used for watch cases and nylon yarn straps. This up-cycling had to pass several of tests, for aesthetics but mainly for technical reasons: long lasting, shock-proof, sun cream, UV, tension and elasticity (non-deforming with age) etc. Some modifications and strengthening were needed before Mondaine could launch its Luminox x Bear Grylls x Tide series in September 2020.

Long lasting:

The tests conducted showed that the upcycled material from the ocean meets similar criteria as oil-based materials for both watch cases (hard material) and straps (soft nylon material).

The watches are assembled in the company's own factory in Biberist, Solothurn, Switzerland, where 70-80% of the electricity is generated by the photovoltaic installation on the roof.

Packaging:

For these Luminox Tide products, Mondaine developed a special gift box that's made of 100% recycled cardboard, which of course is recyclable and contains no mixed materials. The sleeve and 'limited edition paper' are made with FSC-certified paper (the same as all the company's print materials) and are recyclable of course.

End of life cycle:

Mondaine is probably the first and still the only watch company to encourage consumers to send their old or defective watches back to the company for dismantling and recycling the parts where feasible – not only does Mondaine accept its own brands, it also accepts all other brands (except plastic watches from other brands, as some can't be repaired and dismantled).

Sources:

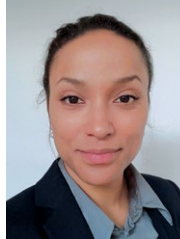
Website links and publications.
www.luminox.com
www.mondaine.com (sustainability report https://cdn.shopify.com/s/files/1/0046/1075/2585/files/Prd_MON_Sustainability-Report_2020_V1_HR_3.pdf?v=1605682120)
<https://tide.earth/#home>
<https://www.forbes.com/sites/katematthams/2020/06/29/mondaine-essence-first-truly-sustainable-swiss-watch/>
https://m.youtube.com/watch?v=v_1kUZM6xhk



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