CREDIT SUISSE

The responsible consumer

Whitepaper

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The responsible consumer

Foreword

Since establishing the Impact Advisory & Finance (IAF) Department in October 2017, we have published a number of thought leadership pieces sharing our perspectives on the rapidly developing sustainable finance market.

As IAF continues to engage with clients across the bank, from ultra-high net worth individuals to large institutional investors and corporates, we are able to identify those emerging trends, themes, and business opportunities of most relevance to our clients that align with their growing appetite to invest more sustainably. Our aim is to utilize our expertise and market insights to meet these demands with differentiated, tailored solutions. In some cases, this will be through a bespoke product or offering that meets the need of an individual client; but often, we are able to create an investment vehicle that we believe will have broad appeal.

As we seek to further leverage our resources, relationships, and structuring skills to bring additional thematic investable opportunities to clients interested in sustainable finance, we are aided by attempts, both internal and external, to frame the investment landscape. Externally, the creation of the UN's Sustainable Development Goals (the SDGs) has provided a basis for a shared language and for prioritizing areas of focus. Internally, readers of this whitepaper may be familiar with the Credit Suisse Supertrends, which have identified five secular market trends that are expected to transcend economic cycles and provide attractive long-term investment returns; one of which is "Millennials' values."

The notion of the responsible consumer, in line with SDG 12 (Responsible Consumption and Production) falls squarely within our "Millennials' values" Supertrend, as Millennials are significantly disrupting many traditional business models and creating completely new ones by increasingly voting with their powerful collective wallets. They are demanding a more environmentally-friendly, ethical approach to business and investment and supporting concepts such as the circular economy, which calls for the elimination of waste and the continuous use of resources in a closed loop system.

Companies that are prepared and able to respond to these demands will attract the Millennial dollar and are already showing discernible valuation benefits. The recent Initial Public Offerings (IPOs) of companies such as The RealReal, the first public listing of a consignment clothing business, which traded up 40% within the first trading day, and Beyond Meat, the plant-based alternative hamburger business which has been the best performing IPO in over two decades, are just two examples of companies whose business models are fully aligned with the responsible consumer. We are proud at Credit Suisse to have been a lead underwriter on both of these offerings and we look forward to continuing to play a meaningful role ahead in supporting our clients to "Generate returns. Sustainably."

Marisa Drew
CEO, Impact Advisory & Finance (IAF) Department

Introduction

Over the past half-century, extreme poverty has shrunk by more than half; global infant mortality has plummeted by nearly 75%; and the length of schooling for an average person has more than doubled. All of this has been made possible, in no small part, by consumerism. After all, consumerism is the engine that drives our capitalist economy, which in turn fuels the economic growth upon which investment returns are made.

The problem is that society is in a global overshoot, consuming more resources than the Earth can possibly sustain. The term “environmental credit crunch” best articulates our current predicament. Like in finance, credit allows a borrower to increase material wellbeing today at the expense of future income. In environmental terms, this means raising the standard of living of current generations through the consumption of finite natural resources. And just as in finance, a credit crunch occurs when the act of using credit is no longer possible.

The World Wildlife Fund (WWF) first coined the term in early 2008, but it was quickly overshadowed by another, more immediate credit crunch – the 2008 financial crisis. As a result, instead of winding down its dependence on nature, the global community found itself accelerating the pace of borrowing, repaying current financial debts while accruing a greater and greater ecological deficit.

The results have been concerning. Global greenhouse gas emissions rose to an all-time high in 2018, despite international commitments to decarbonize. One in four species is now at risk of extinction – adding up to approximately one million species globally. And the equivalent of roughly 30 football fields of tropical forests are lost every minute as a result of unsustainable agriculture and land-use practices.

The word “consume” literally means to “destroy, as by fire or disease, to squander, to use up.” But consumerism need not be so destructive.

Goal 12 of the United Nations Sustainable Development Goals seeks to ensure sustainable consumption and production. Achieving this goal would do more than just save the planet. It could also create vast new economic opportunities. From secondhand fashion to plant-based proteins, transitioning to a more sustainable consumer economy could unlock USD 4.5 trillion in new opportunities per year.

This report was printed on 100% recycled fibers, no trees have been felled. Unlike conventional paper production, the process was completely chlorine free and used 60% less energy and 70% less water. It bears the highest quality label of recycling paper, “Blauer Engel.”

The ink printed on this paper is mineral oil free and consists only of renewable materials.

Additionally, with the printing of this publication, Credit Suisse supports a carbon offset project called “Forest conservation in Pará,” which helps conserve of 90,000 hectares of rainforest in Brazil. This is an important source of carbon reduction (145,000 tons a year).

Chapter 1
Ecological limits

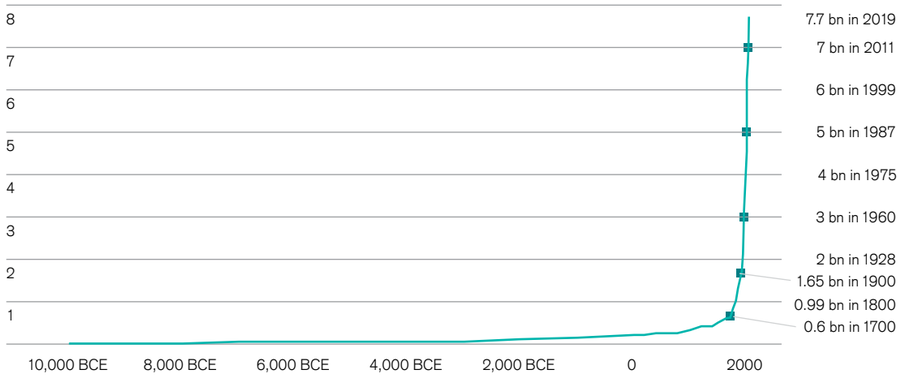
Ecological limits could pose a threat to business continuity for consumer goods companies.

Demographic pressure rising
Since farming began in the Fertile Crescent around 10,000 years ago, the world's population has increased from approximately 5 million to nearly 7.7 billion, and is expected to peak at around 9.5 billion by the middle of this century. Clearly, population growth comes with its own set of inherent challenges. Theoretically, at least, more people require more resources, meaning that, as the population increases, the Earth's resources deplete more rapidly.

The reality is somewhat more complicated. While all people consume resources, the proportion of global resources consumed is largely dependent on income. The United Nations Development Programme (UNDP) reports that the wealthiest 20% of the global population account for roughly 80% of total private expenditure. The poorest 20%, by contrast, account for less than 2%.

Economic development has become a double-edged sword. Over the next twenty years, the number of middle-income consumers globally is expected to increase by 3 billion people, more than tripling the use of natural resources, according to the World Resources Institute (WRI). As more people escape poverty to join the ranks of the middle class, they too are likely to use a greater share of the Earth's limited environmental resources. If population growth is to become sustainable in the future, it will require a rapid decoupling of consumption from environmental depletion.

World population
The size of the world population over the last 12,000 years, in billion



Source Our World in Data

Ecosystems on the brink
Consumer goods comprise an estimated two thirds of global trade by volume, making it one of the most important sectors in the global economy. Its size comes at a cost: A new study in the Journal of Industrial Ecology found that household consumption is responsible for 60% of global greenhouse gas emissions and 80% of fresh water usage (primarily from agricultural irrigation). When taking into account the full value chain – from material extraction through to end-of-life – consumer goods drive a bigger share of ecosystem losses than any other sector.

Conventional methods of extraction, production, distribution, consumption, and disposal have been built around the presumption of cheap and unlimited natural resources. From an environmental standpoint, the global consumer goods economy is hugely inefficient (see value chain on page 10).

Fresh water
Approximately 1.2 billion people, nearly one-fifth of the world's population, live in water-stressed areas. If current trends continue, demand for fresh water will exceed viable resources by 40% by 2030.

Forests
Forests still cover about 30% of the world's land area, but they are disappearing at an alarming rate. An estimated 17% of the Amazon rainforest has been destroyed over the past 50 years alone. In August 2019, as this paper was being written, Brazil had recorded more than 72,000 forest fires, an 84% increase on the same period in 2018.

Arable land
It takes up to 500 years of unimpeded ecological changes for the Earth to produce just 2.5 centimeters of topsoil. Current rates of erosion are 100 times greater than the pace at which soil formation can occur. Already, the World Bank estimates that up to one-third of the Earth's arable land has been lost.

Oceans
90% of global fish stocks are now fully or overfished, gyres covering an estimated 40% of the Earth's ocean surfaces are now full of plastic waste which kills an estimated 100,000 marine mammals every year; and over the past three decades, nearly half of all coral reefs have died. Yet by far the biggest threat to world oceans is deoxygenation. Ocean dead-zones (areas with zero oxygen) have quadrupled in size since the 1950s, while the number of very low oxygen sites has multiplied tenfold.

The WRI foresees resource use more than tripling in the next twenty years. With signs of depletion already visible, the business model of many consumer goods companies could be under threat.

Value chain

	Extraction	Production		Distribution	Consumption	Disposal
T-shirt blend of cotton & synthetics	2,700 liters of water equal to 30 bathtubs to make a **single T-shirt.**	1/5 of **industrial water pollution** stems from textile dyeing and treatment.		10% of **global greenhou… gas emissions** can be traced back to the **apparel industry.**	80 billion new pieces of clothing a year. +400% 2015 1995	Recycling rates are **low:** **Only 1%** of old garments turned into new ones. 3/4 of the materials used to make clothes end up in **landfills** or are **burned.**
Smartphone	1,000+ different materials used to produce a **single smartphone.**	Factories producing **semiconductors** for smartphones use as much energy in a year as 50,000 homes.		200 terawatt hours of energy are used by **data centers** each year.	Extending the life of all European smartphones by 1 year = removing 2 million cars from traffic.	70% of all hazardous waste in landfills is **e-waste.**
Frozen shrimp 454 gram bag	5 to 20 kg of **bycatch** is discarded for **every 1 kg** of wild shrimp caught.	Reports of **slave labor** in fish peeling sheds in Thailand.		1 ton of carbon dioxide is produced by a **454 gram bag** of **frozen shrimp.**	5 **grams** of microplastic – also found in shrimp – is consumed by an **average person per week**. Equivalent to the weight of a **credit card.**	There is a **one in three chance** that the shrimp will be **discarded**, along with the **plastic bag.**
Plastic bottle	6% of the world's oil is used to make plastics, equivalent to the **global aviation sector.**	Refining and manufacturing plastic resin feedstocks is linked to cancer + leukemia.		Globally, the energy required to produce and transport **plastic water bottles** could **fuel** 1.5 million cars / year.	Plastic consumption is expected to **quadruple by 2050.** +300% 2050 2019	Only 14% of plastic packaging is collected for **recycling.**

Source
see references on page 42

Chapter 2
Forces of change

Growing regulatory pressure, investor interest, and consumer demand make the industry ripe for disruption.

The costs of unsustainable production models are not just environmental, however. They also come at a heavy toll to the global economy. Biodiversity losses alone could cost USD 14 trillion per year by 2050 – around 17% of world GDP, according to a study published in the journal Current Opinion in Environmental Sustainability.

A number of forces are converging that are making sustainable production and consumption not only more attractive as a business model but increasingly inevitable:

Legal & regulatory pressure on the rise
The failure to factor the cost of environmental externalities into the final price of goods sold is a classic example of a market failure. And as with any market failure, the government can play an important role in rectifying imbalances.

Since the 1970s, the world has witnessed a 38-fold increase in environmental laws, according to analysis by the United Nations Environmental Programme. Increasingly, the consumer goods sector is finding itself under heightened regulatory scrutiny. To highlight just a few recent examples:

- The European Union's Circular Economy Package, which established binding targets for recycling of municipal waste, was approved in June 2018. Member states now have 24 months to transpose the directives into national legislation. Over 127 countries globally have at least some form of legislation to regulate plastics, while 27 have advanced plastics regulations.
- In 2019, the Chinese Ministry of Ecology and Environment announced that it would expand its ban on waste imports to include post-consumer plastics such as shampoo or soda bottles. Other waste-importing countries, such as Thailand, Malaysia, Vietnam, and Indonesia, have announced similar bans. This has put a serious strain on waste-exporting countries.
- South Australia has since announced plans to ban plastic straws, cutlery, and drink stirrers in an effort to curb single-use plastic use.
- The United States is considering a bill that would ban dozens of toxic substances from consumer cosmetics – including asbestos, lead, formaldehyde, toluene, triclosan, PFAS chemicals, and certain parabens and phthalates. Many of these substances have already been banned in Europe and other countries around the world (see page 33 for health effects of common cosmetics ingredients).

The increasing number of environmental regulations around the world has also given rise to a new class of litigation. Globally, close to 1,000 climate change-related cases have been filed to date, according to White & Case.

While the damages accrued to private companies have so far been limited, legal experts are highlighting parallels between the current onslaught of environmental litigation and tobacco claims of previous decades.

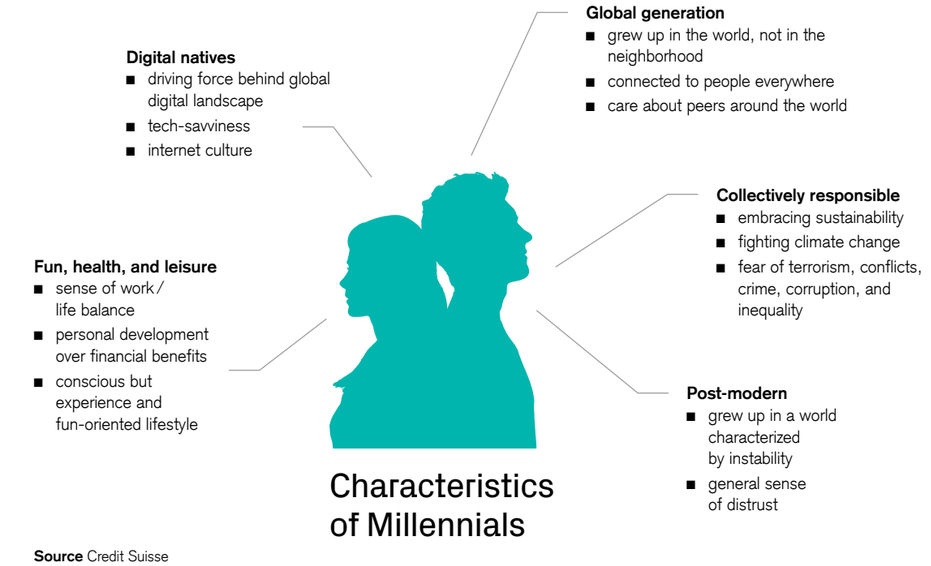
Taken together, it is reasonable to assume that the rise of regulations, legislation, and litigation will make the cost of unsustainable production increasingly expensive going forward.

Changing consumer preferences
Arguably the biggest driver of sustainable consumption trends are, for the time being at least, consumers themselves. Globally, two-thirds of consumers say they would be willing to pay more for sustainable goods, according to a survey by Nielsen.

While interest in sustainability spans generations, Millennials (defined by Credit Suisse as those below the age of 35) are proving to be a key driving force. Despite coming of age in a difficult economic climate, survey after survey has shown that Millennials are more willing to pay more for sustainable goods than previous generations. As they become an increasingly influential consumer group, demand for sustainable products is likely to increase considerably.

This has real world implications. Another study by Nielsen into the purchases of common fast-moving consumer goods found that products with sustainability claims generally outperformed the growth rate of total products in their respective categories.

Characteristics of Millennials
Below the age of 35



Source Credit Suisse

Interview: A view from Asia

Impact Advisory & Finance Department APAC, Credit Suisse

In your opinion, are consumers in Asia less or more willing to shop sustainably?
We tend to assume that middle-class consumers in North America and Europe are more likely to shop sustainably, but these assumptions don't necessarily hold true. Studies have found that consumers in Asia are actually more willing to pay more for goods and services from socially responsible companies (64%) than consumers in Europe and North America (42% and 40%, respectively). As well, China and India account for a large share of the world's Millennials – and we know they are more likely to shop sustainably.

How are governments in Asia shaping the responsible consumer transition?
Consumer interest is growing, but governments are still leading the transition in Asia. India's government announced this year that it would spend close to USD 1.5 billion to subsidize hybrid and electric cars and buses, aiming to see electric vehicles (EVs) make up 15% of domestic sales in five years. There are now one million electric rickshaws in the country, transporting around 60 million people a day.

How are companies responding?
A large tech player in China now incentivizes responsible consumption by linking the payment of green products or services with green credits that its 500 million users are using to plant trees in China. More than 100 million such trees have been planted so far. This is more than Corporate Social Responsibility, it is business recognizing that consumers want to do good with their purchases, in a way that can be lucrative for companies.

> “ Governments are often inspired to act in the face of public pressure.

Governments are often inspired to act in the face of public pressure. China's recent Five-Year Plan, for example, born in part from growing public awareness concerning the harmful effects of air pollution, which is responsible for more than one million premature deaths a year in China.

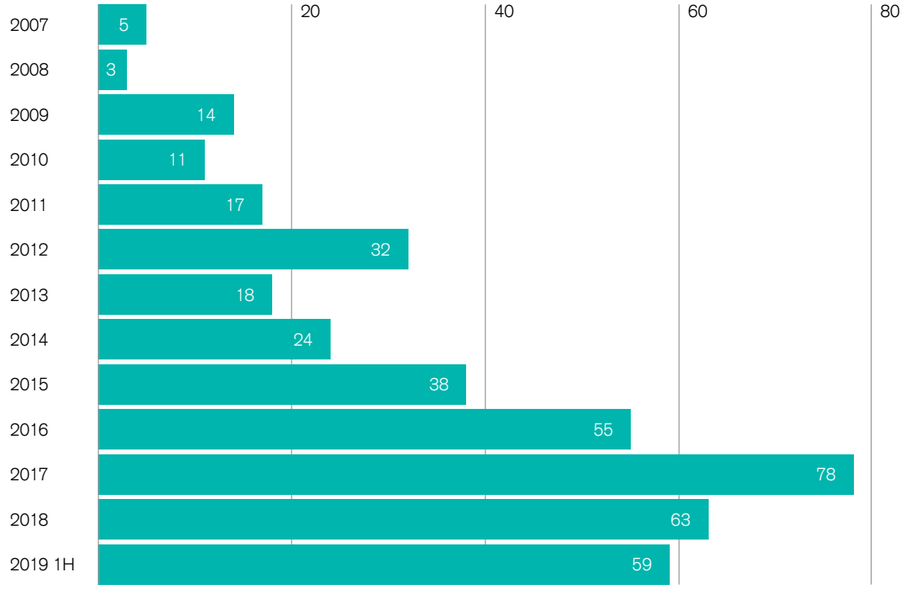
Investors take note
As part owners, investors are important stakeholders in a company. They drive the stock price upon which management incentives are often based and determine the price and ease of access to capital.

Perhaps unsurprisingly given the proliferation of policy interventions and consumer interest in this space, investors are expressing a greater interest in sustainable investing. Since 2012, reported assets under management in sustainable investment strategies have risen from USD 11 trillion to USD 31 trillion in 2018, as stated by the Global Sustainable Investment Alliance. Likewise, the Global Impact Investing Network estimates that impact investments, a subset of sustainable investments that focus on investing in companies and projects with measurable environmental and social benefits, has grown from USD 8 billion to USD 502 billion.

Shareholder activism, in particular, can play an important role in pushing companies to adopt more sustainable policies. According to Activist Insight, the number of shareholder campaigns related to environmental, social and governance themes has increased twenty-fold since 2007. In 2019, for example, a coalition of investors worth a combined USD 6.5 trillion challenged fast food companies to put robust targets in place to limit negative environmental impacts of meat and dairy supply chains. Likewise, another coalition of investors helped convince one of the largest commodity companies in the world to cap coal production at current levels and to prioritize investments in green technologies.

If successful, shareholder activism can also have a positive effect on financial returns. A 2012 study by Dimson et al. found that successful shareholder engagement on environmental, social and governance issues resulted in 4.4% higher returns, on average.

Growth in ESG activism
Number of environmental, social and governance (ESG) related campaigns 2007 – 2019 (1H)



Source Activist Insight

Chapter 3
The opportunity

The transition to a more sustainable consumer economy represents an enormous opportunity for investors.

With growing demand from consumers and investors, increasing pressure from regulators and proliferating signs of resource depletion, the consumer goods economy is ripe for disruption.

Much research has focused on the relationship between environmental, social and governance (ESG) factors and financial performance. Unlocking the opportunities associated with responsible consumption, however, means looking beyond standard measures of corporate responsibility (such as employee wages or gender equality) to real business-model transformation.

For investors, this represents a clear opportunity. In 2019, products marketed as sustainable experienced market growth 5.6 times faster than non-sustainable alternatives, according to a study by New York University's Center for Sustainable Business. Likewise, companies catering to Millennial tastes, including demand for sustainable products, have generally outperformed their peers since 2016.

The market is in the early stages of transition, driven by both push factors (resource depletion and regulatory pressure) and pull factors (growing consumer demand). This represents a unique opportunity for investors. Companies that are quick to adapt to this new reality are likely to benefit from an early mover advantage. A recent study by Accenture shows that the transition to a more circular economy – one that minimizes waste and makes the most use of existing resource – could represent a USD 4.5 trillion per annum opportunity by 2030.

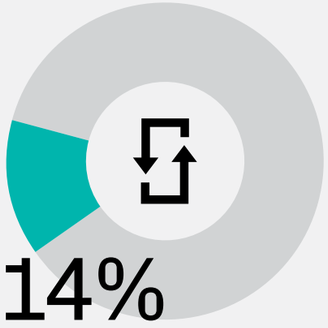
Millennial exposure boosts stocks
Companies catering to Millennial tastes outperform

Source Bloomberg

A note on plastics

From cosmetics to fashion, most consumer sectors covered in this report rely on packaging. Of the 78 million metric tons of plastic packaging produced each year, a mere 14% is recycled, according to the Ellen MacArthur Foundation. An estimated 8 million metric tons end up in the world's oceans every year. Without urgent action, the WWF estimates that the volume of plastic waste could double by 2030.

Room for improvement
Recycled plastic packaging



of the 78 million metric tons of plastic packaging is recycled.

Many companies are responding to the global plastics crisis by promising to increase their share of packaging from recycled plastics. Yet while efforts to improve recycling would ease some of the problems associated with plastic pollution, it is no panacea. Recycling still requires large amounts of energy, water, and fossil fuels.

Bioplastics may be another solution to the global plastics crisis. Examples include plastics derived from wood pulp, crustacean shells, corn, or sugarcane rather than petroleum. With an estimated 8% of the world's oil used to make plastics (more than the oil consumption of the global aviation sector), advocates argue that they could help to reduce greenhouse gas emissions from fossil fuels. However, not all bioplastics are created equal, and critics have pointed out that, if improperly discarded, bioplastics could increase greenhouse gas emissions and worsen the global plastics crisis. This is because most bioplastics are not in fact biodegradable. Instead, they may require high temperature industrial composting facilities to be broken down, infrastructure which most cities lack. In landfills, bioplastics release methane, a greenhouse gas 23 times more potent than carbon dioxide. By contrast, compostable plastics, a subset of bioplastics, largely degrade within 180 days inside industrial compost facilities.

Globally, the number of government policies directed at tackling the use of single-use plastics has been on a steep incline – rising from two at the turn of the millennium to 202 in 2018, according to Credit Suisse analysis. With growing pressure from consumers and policy makers, companies (and their investors) are racing to find the next alternative. One large chemical company is turning plastics back into oil, for example, while a US pizza company found its materials business quickly surpassed revenues from food after it acquired a compostable packaging start-up.

The best solution to the global plastics crisis could be to reduce the need for plastic packaging altogether. In the United States, for example, one company is using a high definition laser to remove pigment from the outer layer of fruit and vegetable peels, leaving a permanent mark in lieu of plastic labels. Another large multinational is introducing highly concentrated refills for home cleaning products, eliminating the need to re-purchase trigger spray bottles with every use. And retailers around the world are implementing bans on single-use plastic bags. Consumers can also play an important role in becoming less dependent on plastic packaging. From Brooklyn to Kuala Lumpur, zero waste shops are gaining momentum. These shops cater to a growing consumer movement that seeks to do away with packaging. Instead, shoppers bring their own containers to stock up on consumer staples like flour, raisins, oil, or shampoo.

Fashion

Consumer appetite for the latest trends alongside rising global income levels have led to a rapid increase in clothing sales. The USD 1.7 trillion garment industry is the world's third biggest manufacturing industry after the automotive and the technology industries. It is also of vital importance to the economies of many developing countries.

Rising consumption may create growth in jobs in developing countries, but it also saddles these countries with the brunt of the environmental and social burden. Despite efforts to curb sweatshop conditions in the industry, a recent Oxfam report found that workers in Bangladesh and Vietnam, which supply a significant share of the world's clothes, did not earn enough to afford basic essentials like housing, healthcare, or education.

In addition to the social costs, rising consumption of apparel also comes at enormous environmental costs. The chemicals used to bleach, treat, and brighten the world's clothes have been linked to tuberculosis, birth defects, and reproductive problems. According to the United Nations Economic Commission for Europe, fashion accounts for more than 20% of global industrial water pollution. It is also one of the biggest contributors to climate change, consuming more energy than the international aviation and shipping industries combined.

The tragedy is that these burdens on human health and the environment are almost completely unnecessary. Nearly three-quarters of the materials used to make clothes end up in landfills or are burned at the end of their life, while just 1% of old garments are turned into new ones.

With global apparel consumption projected to increase by 63% by 2030, according to a recent report by the Global Fashion Agenda and Boston Consulting Group, significant changes will need to be made in how clothing is produced and consumed. There are signs that change may be underway. At the heart of the industry's woes is "fast-fashion," a business model built around producing clothes as cheaply and rapidly as possible. But growing awareness concerning the environmental and human consequences of fast fashion is leading to a change in consumer expectations. From "more for less" to "less is more," consumers are starting to think more consciously about their purchasing decisions. According to a 2018 study by GlobalData, 72% of consumers polled prefer to buy from environmentally friendly fashion brands, a fifteen point increase from 2013.

As sustainability becomes a crucial buying factor for mass-market consumers, the opportunity for investors could be significant:

- **Regenerative materials**
  Crops grown to supply the growing apparel industry, including cotton, linen, hemp, and indigo, are some of the most polluting in the world. Cotton is a case in point: One tenth of all agricultural chemicals and 25% of pesticides are used to produce the world's (non-organic) cotton, which comprises less than 3% of the world's agricultural land by area.

  Fashion brands are looking to sustainable agriculture to curb these negative effects. One promising example is regenerative agriculture, a type of organic agriculture that seeks to restore degraded land through practices such as no tillage, crop rotation, or on-farm fertility. Research from the Rodale Institute indicates that the resulting carbon sequestration could help to reverse the effects of climate change.

  While regenerative farming has gained most significant traction in the natural food space (see page 26), fashion brands are making serious inroads as well. At the time of writing, five textile and fashion brands were partnering on a Regenerative Organic Certification standard to ease the process of identifying suppliers. If rolled out on a global scale, efforts like these could significantly improve the human, soil, and climate impacts of clothing supply chains around the world.

> "Fashion accounts for more than 20% of global industrial water pollution.

- **Alternative fabrics**
  While organic materials such as cotton, linen, hemp, or viscose have been linked to myriad environmental and social challenges, synthetic materials like nylon or polyester have fared little better. These materials are often treated with thousands of harmful chemicals, making them even more toxic than their non-synthetic counterparts. The manufacture of nylon, for example, creates nitrous oxide, a greenhouse gas 310 times more potent than carbon dioxide.

  High-end fashion and sportswear brands have started to take an interest in eco-friendly alternative fabrics. Examples include liquid silks that use biogenetic engineering to replicate the DNA of spider silk, yarn from coffee grounds and recycled plastic, vegan leather made from mushrooms, or technologies geared to changing the molecular composition of polyester – making it more digestible for microbes to consume.

- **Radical transparency**
  Reports of environmental harm, sweatshop conditions, as well as child labor have eroded consumer trust in the mainstream fashion industry. With social media making it increasingly difficult for brands to control their message across borders, today's consumers are more likely than ever to research the brands they buy. A study by McKinsey shows that Millennials are at the forefront of this movement, with 52% saying that they always research brands for background information before making a purchasing decision, compared to 45% of Gen Z and 41% of Baby Boomer consumers.

  In an effort to regain trust, several fashion brands are introducing "radical transparency" across their supply chains. Innovations include Radio-Frequency Identification (RFID) tags in the form of threads that can be integrated in textiles to track materials across the entire lifecycle, using blockchain to track clothing from raw material to consumer, or genotyping to trace the source of cotton fibers to specific regions.

  For fashion brands, innovations like these are making it easier to monitor potential violations of environmental and social norms across their supply chain. For consumers, radical transparency means that the public can hold companies to account for their claims – mitigating the risk of greenwashing and accelerating the sustainable transition.

> "The secondhand clothing market is expected to double in size over the next five years.

- **Resale, refurbishment & rental**
  In the UK alone, consumers have unworn clothes worth an estimated GBP 30 billion lying in their closets, as stated by WRAP. Second-hand markets extend the lifecycle of garments, reducing the total volume of clothing that eventually finds its way to a landfill. According to research by ThredUP (in conjunction with GlobalData), the secondhand clothing market is expected to double in size over the next five years and could reach a staggering USD 51 billion in the United States alone by 2024.

  Online resale companies are helping these brick-and-mortar shops find a wider audience online.

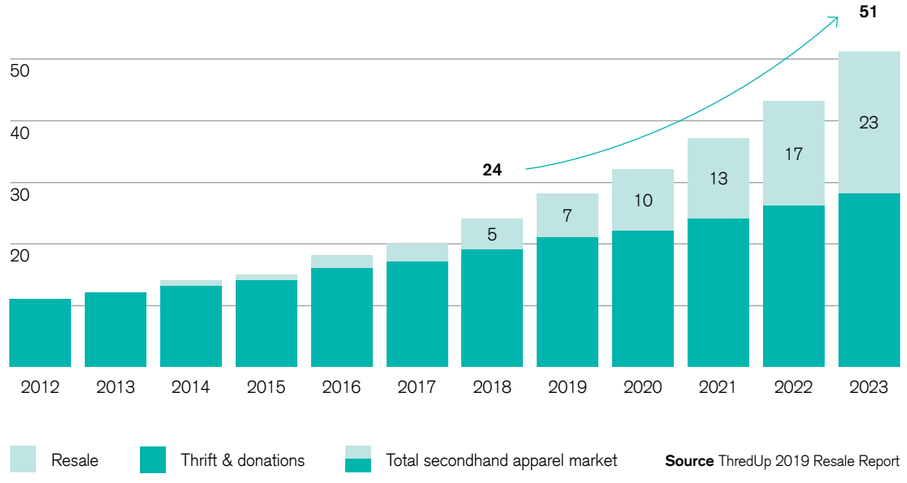
  Other examples of secondhand business models include clothing refurbishment and rental models – the latter of which caters to the human desire for "new things" without the associated waste. More than a quarter of consumers expect to increase their spending in fashion rental over the next five years, four times the number of consumers who say they will increase their spending in fast fashion.

  Whether resale, refurbishment, or rental, the rapid rise in secondhand business models has come at a direct cost to established brands.

- **Slow fashion**
  Growing consumer awareness concerning the environmental and human consequences of fast fashion has led to a new movement in fashion – slow fashion. The antithesis to fast fashion, slow fashion's emphasis is on "buying less, but better."

  Companies are catering to this new movement by rejecting mass production, instead emphasizing "fewer, better things." In 2011, for example, one outdoor sportswear brand published a provocative marketing campaign with the slogan "Don't buy this jacket," listing in detail the adverse environmental impacts associated with producing the jacket in question. Within a year, sales increased by nearly one-third. In an interview with the New York Times, the company's CEO explained that the brand's value proposition, putting "value in vogue," had struck a chord with a small but growing cohort of sustainably-conscious consumers.

Secondhand market will reach USD 51 billion in 5 years
Size of the United States secondhand apparel market in billion USD



Source ThredUp 2019 Resale Report

Consumer electronics

By 2025, the number of electronic devices connected to the internet is expected to surpass the number of people on the planet by a multiple of ten. The economic potential of these devices is staggering: In 2017, the global consumer electronics market was valued at an estimated USD 1.1 trillion. By 2024, Zion market research predicts that this number might exceed USD 1.7 trillion.

Unfortunately, the e-waste trash stream – from fridges and computers to smartphones and hair dryers – is expanding at the fastest rate, nearly doubling in volume over the past nine years. The yearly accumulation in 2018 alone was 49.8 million tons, according to the Partnership for Action on Computing Equipment (PACE). As pointed out in an article in the New York Times, this would be equivalent to more than a million 18-wheel trucks stretching from New York to Bangkok and back. The lion's share of this waste ends up in landfills or is improperly discarded in the informal economy.

Depending on how e-waste is handled, however, it could represent either an environmental burden or economic resource. Many of the same materials that make electronic devices so toxic and difficult to recycle are also increasingly scarce and economically valuable. For example, a recent study by the University of Plymouth found that a ton of smartphones contains 100 times more gold than a ton of gold ore. The World Economic Forum (WEF) states that the material value of our electronic waste could be an astounding USD 62.5 billion annually, more than the GDP of most countries.

Capturing this opportunity will mean reconsidering traditional business models. While the industry has been slow to respond, there are signs of change:

- **Dematerialization**
  Planned obsolescence refers to a strategy in which products are designed to artificially limit the number of years they will be used for. From the perspective of producers, planned obsolescence makes a lot of sense. The quicker a device needs replacement, the sooner a consumer will buy a new one, the higher the revenues incurred from sales.

  One solution could be to move away from business models based on the sale of physical products to ones based on a service – a process known as dematerialization. As a paper by WEF points out, dematerialization is already happening in many parts of the economy. In the Netherlands, for example, one company has started selling lighting as a service. Similarly, several companies are rolling out smartphone leasing programs around the world. Rather than shorten the lifetime of products, dematerialization incentivizes producers to prolong the life of the devices they sell – creating a synergy between corporate and environmental interests.

- **Modular devices**
  When a single component in an electronic device wears out, it is often cheaper and easier to replace the entire device than to repair the single component. As a result, the lifetime of the device is limited to the component with the shortest lifespan.

  One solution could be modular devices in which individual components can be taken apart and replaced when needed. A Dutch smartphone producer, for example, has carved out a niche for itself with pieces that can be inexpensively bought and replaced. There are signs that the model may be influencing larger market players, several of which have experimented with modular phones, with one market leader having published at least two new modular device patents in 2019.

- **Reuse & refurbish**
  Like in fashion, secondhand markets for electronics promise to keep electronics device in use longer. One British telecom company, for example, has announced a recycling program whereby the company buys old smartphones from customers and refurbishes them for resale, mostly in mainland Europe. According to the company, the program has reduced the equivalent of 10,000 tons of carbon emissions and saved over 26 million liters of water in just four years.

  Similarly, as pointed out in a report by the Ellen MacArthur Foundation, the "cascading of components" – the process of reusing functional components from higher-performance applications to lower ones – could help avoid negative environmental impacts and keep components in use for longer. While a lack of standardization has largely hindered the widespread adoption of this practice, some companies have started to experiment with cascading models.

- **Mining for electronic waste**
  As already noted, e-waste contains a treasure trove of high-value and increasingly scarce raw materials. The challenge, of course, is to extract these materials: A single smartphone may contain well over 1,000 different substances. Yet difficult does not mean impossible, and new technologies are making the extraction of these resources increasingly viable. According to the WEF, one recycler in China claims to recover more cobalt from recycled e-waste than the country mines in a year. As pressure mounts on producers of electronic devices to reduce environmental externalities, it is fair to assume that the market for recovered materials will grow.

Compared to the other industries in this report, the electronics industry has been slow to respond to consumer demand for more sustainable products. At least in part, this may be attributable to the high barriers to entry in the consumer electronics space, which make it difficult for incumbents to compete with larger market players. Ironically, an industry so bent on disruption is finding disruption incredibly difficult to achieve. Nevertheless, with consumer demand on the rise, the opportunity for solutions that fill this market gap could be significant.

> "The e-waste trash stream could fill up more than a million 18-wheel trucks stretching from New York to Bangkok and back.

Food & beverage

> “Agricultural output will need to increase by over 50% over coming decades to feed a growing population.

Agriculture accounts for over 70% of fresh water usage and 80% of tropical deforestation, according to the United Nations Food and Agriculture Organization (UN FAO). It is also one of the biggest contributors to ocean deoxygenation, soil degradation, and climate change. With the WRI estimating that agricultural output will need to increase by over 50% over coming decades to feed a growing population, it is becoming increasingly clear that the world will need to rethink what and how it eats.

The environmental and social payoff for doing so could be significant. Of the world's poor, 70% are smallholder farmers, most of them women, according to the World Bank. Transitioning to a more sustainable food system could ensure a more equitable distribution of profits – contributing to other sustainable development goals such as ending world hunger, reducing poverty, and improving gender equality. Some scientists believe that sustainable agricultural practices such as regenerative agriculture could reverse global warming completely while replenishing the soil of nutrients, bringing back old species of plants and animals, and enhancing the ability of soils to store water – thereby reducing agriculture's heavy water footprint and making crops more resilient to drought and heavy rainfall. Likewise, sustainable fishing practices could replenish depleted oceans – allowing fish stocks and other marine species to recover while improving the lives of the 950 million or so people who rely on the seas for their livelihoods.

There could also be a significant opportunity for investors. Consumer interest in sustainable food is on the rise. In a 2017 study conducted by Berkley, food products with sustainability and traceability claims exceeded all other new product themes, including portion control, flavor, nutritional value, or ease of preparation. In another recent survey, commissioned by the European Union Commission Directorate General for Trade, 98% of food retailers in Europe reported that sales of sustainable products had increased over the past five years, growing by close to 20% overall.

With over half of consumers saying they would prefer to buy foods that are produced in an environmentally sustainable way, the opportunity for investors could be meaningful.

Tech-savvy farms

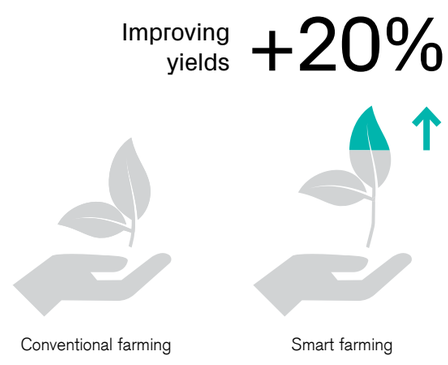
Water scarcity, climate change, population growth, and less arable land available per capita: the future of food will depend on agriculture's ability to do more with less. From drones to satellite images and indoor farms, farmers are increasingly making use of technological innovations to do just that.

Smart farming, a diverse set of tools and practices that use information communication technologies in agriculture, can measure crop and soil characteristics of fields to within several inches of accuracy, enabling farmers to better gauge exactly how and when different parts of a field need to be watered, fertilized, and harvested. This has the potential to drastically reduce resource use while improving yields by as much as 20%.

Other companies are focusing on applying engineering principles to biology, an emerging field known as synthetic biology. In agriculture, synthetic biology promises to redesign biological systems that are better adapted to a rapidly changing climate. Proponents claim that well-designed synthetic systems could even reverse some of the harmful effects of agriculture. One US-based startup, for example, produces microbes that can be directly applied to crops in order to produce nitrogen, eliminating the need for synthetic fertilizers altogether. Another company uses wastewater from breweries and beverage plants to cultivate bacteria that it then turns into protein meal for fish feed, eliminating the need to catch wild fish to feed farmed fish (one of the biggest critiques of aquaculture).

Smart farming

Reducing resources



- **Urban & indoor**
  With over three-quarters of the world's population expected to live in cities by the middle of the century, some food and beverage companies are focusing their efforts closer to home. Indoor & urban farms have been touted as a potential solution to feeding a growing population in the future. Alternative grow systems like hydroponic, aeroponic, or vertical farms can grow crops without soil, sunlight, or large amounts of water – reducing agriculture inputs such as water by 70% or more.

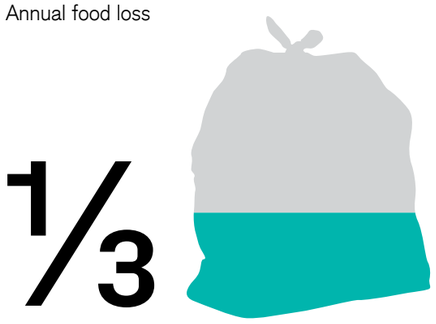
  If fully implemented in cities around the world, urban agriculture could produce as much as 180 million metric tons of food each year, according to a recent study published in the journal Earth's Future. This would amount to approximately 10% of the global output of legumes, root vegetables and vegetable crops. Taken together, the additional ecosystems services associated with urban agriculture, which include reducing the urban heat-island effect, avoiding storm water runoff, nitrogen fixation, and pest control, could be worth as much as USD 160 billion per year.

- **Regenerative & organic**
  Concerns about the adverse ecological and health effects of pesticides have led to a growing demand for organic foods. Organophosphorus – a compound commonly used in pesticides – has been linked to a number of developmental problems, including autism and Attention Deficit Hyperactivity Disorder (ADHD). There is also a growing consensus that the pesticides, fertilizers, and other chemicals used in industrial agriculture are wreaking ecological havoc on oceans, wildlife, and climate. With public opinion galvanized, sales of organic food have been on the rise. According to Ecovia Intelligence, worldwide organic food and drink sales surpassed USD 100 billion for the first time in 2018, a 6% increase from 2017.

  Some critics argue that, since organic agriculture requires more land for the same yield, organic foods may not be a viable solution to feed a growing planet. Regenerative farming could provide an alternative. The term refers to a system of farming practices (usually organic) that aim to capture carbon in the soil while increasing biodiversity, improving watersheds and enhancing ecosystem services. Unlike traditional sustainable farming practices that seek to reduce harm, regenerative agriculture promises to actively reverse damage to soil, water and air quality. With one-third of land once used for farming now abandoned, regenerative farming could prove key to reducing agricultural expansion in the future, according to a study by the University of Sheffield.

- **Minimizing food losses**
  Roughly one-third of the food produced for human consumption is lost or wasted annually. This is a massive problem, with the UN FAO estimating that costs to the global could be as high as USD 2.6 trillion per year.

What a waste
Annual food loss



of the food is lost or wasted annually.
This is costing USD 2.6 trillion per year.

A report by the Boston Consulting Group showed that reducing food loss through improvements in supply chain infrastructure and efficiency alone could save an estimated USD 270 billion per year. Examples include an invisible coating from plant-derived materials that can help postpone spoilage of fresh produce or software that can track where waste occurs. In one company, using waste-tracking software helped to reduce the amount of waste headed for landfills by as much as 65% within the first year.

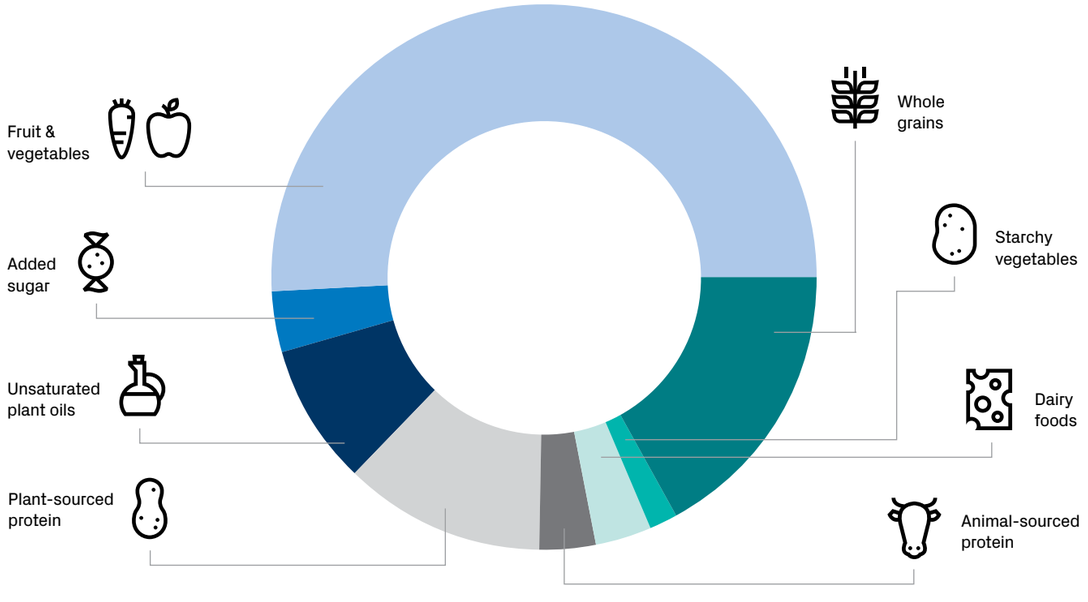
Other innovations focus on reducing food losses in developing countries, where approximately half of all food losses occur. While food waste in developing and industrialized countries is equally high, most of the food loss in developing countries occurs at post-harvest and processing levels. Some of the most basic fixes to food waste could therefore be at the bottom end of the food supply chain: metal grain silos have helped against fungus ruining grain stocks while replacing sacks with crates could reduce tomato spoilage. One public-private partnership in Kenya, for example, was able to more than double the amount of food purchased from smallholder farmers through "pay as you store" solar-powered refrigeration units.

Finally, some companies are focusing on innovative ways to upcycle food waste into food and other products. Examples include converting used coffee grains into logs and biomass pallets or upcycling food waste into new food products (such as snacks made from chicken breast trims, vegetable puree, and other leftover food products). As more and more initiatives like these emerge, what was once dismissed as waste could eventually become a valuable asset in its own right.

- **Plant-based diets**
  According to a new study led by researchers at the University of Oxford, if all humans were to convert to a plant-based diet, global farmland use could be reduced by more than 75% – an area equivalent to the US, China, the European Union, and Australia combined. Doing so, the researchers concluded, would significantly curb deforestation, biodiversity losses, and mass extinctions. Livestock uses 83% of the world's farmland, but provides just 18% of the world's calories. It is also responsible for 18% of global greenhouse gas emissions, more than all forms of transport put together. In addition, research by the American Heart Association has shown that a plant-forward diet (one in which at least 70% of meals do not contain meat) could lead to a significant reduction in deaths from heart attacks, stroke, and other cardiovascular diseases.

  Considering the environmental and health benefits, it is perhaps not surprising that consumers (in high-income countries at least) are expressing a greater interest in diversifying their diets, reducing meat consumption and eating more plant-based foods. According to research by Mintel, sales of meat-free foods in the UK alone increased by 22% between 2013 and 2018. This growth is expected to continue, with the value-sales of the meat-free market forecast to increase by another 44% by 2023.

A sustainable diet
The planetary health plate



In 2019, the EAT Lancet Commission quantitatively described a universal healthy reference diet, addressing the need to feed a growing global population while also defining sustainable food systems that will minimize damage to our planet. While a small amount of meat is still on the plate, the Commission's finding showed that developed countries would need to cut meat consumption by 80% and developing countries by 50%.

Source EAT Foundation

Mobility

As pointed out in an article by Elizabeth Kolbert in the New Yorker, the most popular mode of transport in most western cities in the mid-eighteen hundreds was the horse-drawn streetcar. By 1880, there were more than 150,000 horses living in New York City alone, each producing an average of 22 pounds of manure per day. Urban planners warned that, without urgent action, cities across the world would soon be "inundated with poop." Then, around the turn of the 19th century, almost without comment or deliberation, the crisis passed. By 1912, automobiles outnumbered horses in New York.

Today, the world's transportation systems are facing a new challenge: climate change. From airplanes to automobiles, what fuels global transportation is, for the most part, fossil fuels.

The global transportation sector is responsible for an estimated 14% of global greenhouse gas emissions. Without aggressive and sustained policies, the United Nations Framework Convention on Climate Change estimates that these emissions will double by 2050.

Added to this challenge is traffic congestion. The urban population has increased fourfold over the past 50 years. At the same time, the stock of passenger cars and motorbikes has increased sixfold. Nine out of ten people now live in places where air quality has fallen below healthy limits, according to the World Health Organization. As many as seven million people die each year as a result. Without urgent changes in how and what the world moves, global cities will, quite literally, become suffocating places to live.

Contrarian corner: Are electric vehicles sustainable?

Some critics have questioned whether EVs are more sustainable than conventional combustion engine-powered cars. Manufacturing EVs requires more aluminum (in order to offset the additional weight of batteries), more copper (to conduct electricity) and more lithium and rare earth minerals than non-electric alternatives. This means that more greenhouse gases are emitted during the production of EVs than of conventional (non-electric) alternatives.

To answer this question, the International Reference Center for the Life Cycle of Products, Processes and Services (CIRAIG) conducted an environmental life cycle assessment of EVs' inputs, outputs, and environmental impacts – from material extraction to end of life.

Perhaps unsurprisingly, the study found that an EV is only as clean as the power grid used to recharge it. Yet even with the cleanest grid mix, the distance an EV is driven relative to a conventional vehicle ultimately determines whether it is environmentally worth making the switch. In Quebec, for example, which derives 99% of its power from renewable energy sources, a car would need to drive more than 50,000 kilometers before it would outdo a traditional vehicle, at least in terms of greenhouse gases. By contrast, in Germany, where fossil fuels still comprise a large portion of the country's total energy mix, a car would need to drive at least 150,000 kilometers before it would become environmentally viable to make the leap.

> "The global transportation sector is responsible for an estimated 14% of global greenhouse gas emissions.

As with the horse-drawn streetcar just one century ago, however, technological innovations are disrupting the future of mobility. From electrification to the internet of things (IoT), numerous trends are converging to help ease the transition toward cleaner transportation:

- **Electrification**
  Think about the future of mobility and one word will likely come to mind: electric.

  From fully battery powered to hybrid vehicles, electric mobility is expanding at a rapid pace. In 2018, according to the International Energy Agency, there were more than five million electric cars on the road, up from just two million the previous year. In terms of sales, the number of new electric cars sold across the world nearly doubled.

Electrification is driven by a combination of policy initiatives and technological innovations. In an effort to curb pollution, China introduced subsidies for EVs in 2010 and made it more difficult for consumers to get license plates for combustion engines. It is now the world's largest market for electric cars. Similarly, in 2018, the European Union approved several significant policy instruments to support growth in the EV market, including new fuel economy standards, incentives to support the rollout of EV chargers, and public procurement of electric buses. Major European cities like Paris, Madrid, Oslo, Brussels, Berlin, Hamburg, and Stuttgart plan to ban all vehicles except electric ones from their city centers by 2030.

Another key driver of growth in the EV market is innovation. Since 2010, the average cost of lithium-ion batteries has fallen by 85% and is expected to drop even further in the coming decade, driven by scale, improvements in battery chemistry, and better battery management systems. By 2022, Bloomberg New Energy Finance estimates that the cost of electric cars will fall below that of internal combustion vehicles.

- **Shared mobility**
  From Shanghai to New York, consumers around the world are giving up their personal vehicles in favor of shared mobility. According to a 2016 McKinsey report, new business models based on shared mobility could lead to an additional USD 1.5 trillion in market value by 2030.

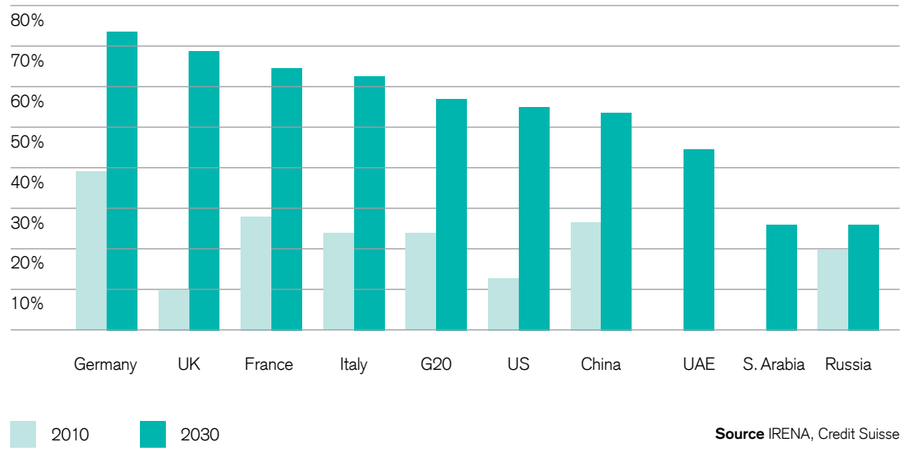
  This is not just good news for investors in shared mobility. Shared mobility could also bring significant environmental gains. By reducing the amount of time a vehicle sits idle in parking, car sharing promises to significantly reduce the total number of new cars purchased – thus curbing environmental challenges associated with the production and disposal of vehicles. In addition, mobility sharing can serve as a supplement to public transportation, allowing commuters to fill gaps in the public transportation network where needed.

  Micromobility in particular could increase access to public transportation, reduce the number of cars on the road and lower the environmental footprint of personal commuting. The term refers to a diverse set of shared modes of transportation provided by very light vehicles such as electric scooters, skateboards, or bicycles. According to analysis by Wired Magazine, one-kilowatt hour of energy could get a gasoline-powered car to travel 0.8 miles, an electric car 4.1 miles and an electric scooter 82.8 miles. For the price of a single Tesla Model 3 (USD 53,000), a city could purchase more than 100 high quality electric scooters – making it a more affordable option for some fast growing mega-cities in emerging markets.

- **Infrastructure**
  Finally, the transition toward sustainable mobility will require significant investments in infrastructure. If all cars were to become electric, demand for electricity would rise by an estimated 20% to 30%. Unless this new energy supply is renewable, EVs could increase, not reduce, traffic-related greenhouse gas emissions.

  Similarly, none of the personal mobility solutions mentioned in this paper can replace the need for better public transportation. While innovations like EVs and shared mobility can ease some of the burden, public transportation, particularly if it is electrically powered, remains the most sustainable method of transportation in urban and peri-urban areas.

Time to shift
Renewable energy as a share of total power generation capacity



Source IRENA, Credit Suisse

Household & personal products

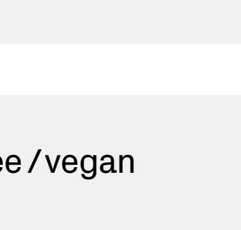
For decades, the household and personal care products industries have experienced relatively undisrupted growth. The mantras that bacteria is bad and that beauty is achievable through a myriad of products has been one of marketing's great success stories. The average US household now spends circa USD 600–800 annually on household cleaning products.

The irony is that in our quest to get clean, our environment has become ever dirtier. The chemicals used in household cleaning and personal care products leech into waterways, contaminate the air with micro-particles, and are toxic to biodiversity and wildlife, potentially entering the food chain. One recent study found that prolonged exposure to cleaning sprays had a commensurate impact on lung health as smoking a packet of cigarettes every day.

Green cleaning

Out of 2,000 cleaning products

53%



contain ingredients known to **irritate the lungs.**

Green cleaning products market:
Expected growth (in USD)

Natural & organic beauty

Examples of controversial ingredients in personal care products:

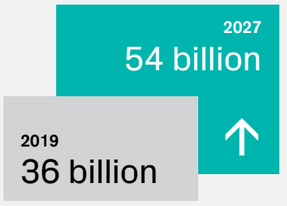
- Aluminum
- Coal tar
- Formaldehyde-releasing preservatives

4,000 tons

of sunscreen is **washed into the oceans** each year.*

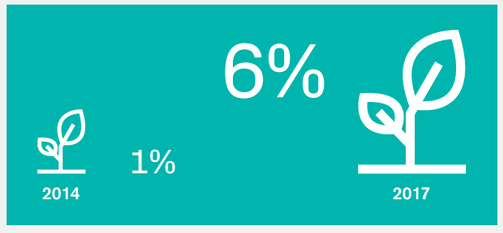
*Linked to serious environmental issues like green algal blooms, birth defects in wildlife, and coral bleaching.

Natural cosmetics market:
Expected growth (in USD)



Cruelty-free / vegan

US vegan population:



Expected cosmetics market growth:

6%
annually
(2019–2023)

Source see references on page 42

All that glitters is not gold (mica)
Mica, which refers to a group of 37 crystalline minerals, has long been the primary ingredient for making things shiny. However, there is a much more sinister side to this glittery substance. It is estimated that 25% of the world's production of mica is sourced from illegal mines, many of which rely on child labor under unsafe and often exploitative conditions.

The Responsible Mica Initiative was established with the aim to implement fair practices, increase traceability along supply chains, empower local communities, and build legal and livable conditions for those affected. Several large beauty brands have become members of the initiative, striving to achieve a 100% sustainable mica supply chain by 2022.

Investing in "The responsible consumer" theme

Interview with Lombard Odier

Interest in sustainable consumption is on the rise. Is it a passing fad or here to stay?
Today, the global economy faces challenges that urgently require sustainable solutions. Pressure points are everywhere, be it excessive food waste and plastic use or rising greenhouse gas emissions. These issues are pushing regulators, businesses, and consumers to change how we behave. These three actors are deeply interconnected.

> "Transition on this scale naturally creates a risk of disruption for companies that are unwilling or unable to change.

Developments in one area often support or create new initiatives in another, and are empowering change across sectors and value chains. This is not a fad. It is a structural shift that we believe will fuel an increasingly rapid transition to a more sustainable system.

Do you see this as a threat or an opportunity for business?
Transition on this scale naturally creates a risk of disruption for companies that are unwilling or unable to change. However, the transition will generate large-scale opportunities and profitable growth for companies that genuinely embed sustainability into their DNA and focus on challenges that are particularly material to their sector.

If we look at the food industry, for example, projections show that a USD 250 billion opportunity exists within precision farming, including real-time crop monitoring, on-demand delivery of irrigation and nutrients, automated vehicle steering, and custom seeding to improve yields. Supply chain optimization is an obvious and essential first goal and improving expiration dates, water usage, and food distribution will create a significant investment needs that we are already highlighting to investors.

Do you believe that financial institutions have a role to play in driving sustainability forward?
We believe sustainability will be the most significant driver of returns and should thus be central to any investment decision today. As the key drivers of change continue to gather pace, sustainable investment opportunities offer the potential for above-average growth and returns. At Lombard Odier, we believe it is essential to differentiate between the winners and losers in this transition to a more sustainable economy. Winners will be companies with solid financials, healthy business practices, and a business model designed to thrive over the long-term.

Within sustainable consumption, we see four key investable themes: Sustainable Food, Sustainable Supply Chains, Sustainable Lifestyle, and Sustainable Urban Systems. Importantly, we believe that the transition to a more sustainable consumer economy is a trans-sectoral challenge that will create opportunities beyond traditional consumer sectors.

Financial institutions, including Lombard Odier and Credit Suisse, are also agents for change. As more investors recognize the underlying financial risks associated with sustainability-related challenges, as well as the scale of opportunity presented by the transition to a sustainable economic model, they are increasingly holding companies and their boards to account.

Sustainable tourism

The last few decades have been pivotal in improving access and mobility for travelers. The increase in flight destinations coupled with a reduction in average flight prices has resulted in people getting quick and affordable access to the entire globe. 2018 marked the ninth consecutive year of continued growth in tourism. While tourism comes with many potential benefits to countries (economic boost, infrastructure development, and employment growth), it also poses considerable environmental and social challenges.

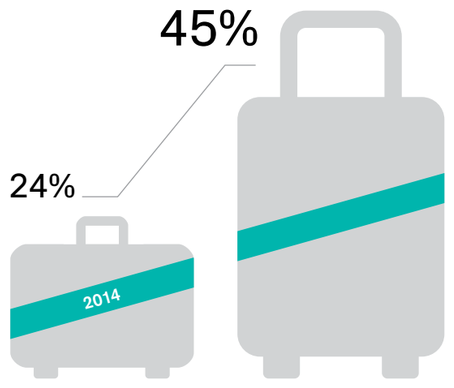
Over-tourism can have devastating effects on the environment. According to the United Nations, tourism is the fourth largest polluter in Europe and accounts for approximately 8% of global carbon emissions. Other environmental consequences include air pollution, deforestation, erosion, and damage to coral reefs, to name just a few.

The detrimental repercussions of mass tourism are not just limited to its environmental impact, however. Low wages and seasonal contracts in the industry mean that local communities may not receive a fair share of the dollar visitors spend. In some cases, tourism may also be associated with human rights violations, such as human trafficking, forced labor, or increased criminality.

Thankfully, new trends such as sustainable tourism are gaining momentum from visitors who wish to travel in a more responsible way. In April 2019, Booking.com surveyed more than 18,000 users and found that awareness and interest in responsible tourism has almost doubled in recent years. In 2014, only 24% of respondents considered sustainability an important aspect of their travel. By 2018, that number had risen to 45%. Consumers are now more mindful of the impact that their actions can have on the planet and its people.

Responsible tourism

Awareness has almost doubled in recent years



Despite its growing popularity, however, sustainable tourism still faces many challenges that could prevent it from becoming mainstream. Tourists are dependent on transportation. By default, this means that tourism is only ever as sustainable as the planes, trains, cars, and cruises used to transport tourists to their holiday destinations (see page 28). Likewise, studies have shown that just 4% of the travel industry offer responsible products and/or services. With nearly half of travelers expressing an interest in sustainable tourism, this represents a clear market gap.

The good news is that changes in the supply side of tourism are taking place and organizations have started to work on providing more transparency to customers. For example, the hospitality industry is also stepping up, with an increasing number of hotel chains announcing their goal to reduce food waste by 50% by 2025 while others have decided to remove miniature amenities in an effort to combat plastic waste.

Sustainable tourism is a term that can no longer be ignored. The devastating impact of over-tourism has confirmed that consumers, governments and companies need to shift toward sustainable practices.

Conclusion

In his 1968 best seller, The Population Bomb, Stanford biologist Paul R. Ehrlich predicted that overpopulation would soon cause a “doomsday apocalypse.” Within the decade, Ehrlich predicted, resource shortages would result in hundreds of millions of people starving worldwide. By 1985, crucial materials would near depletion, pushing prices out of reach. “Starvation among people would be accompanied by starvation of industries for the materials they require.”

At the time, Ehrlich’s predictions seemed reasonable enough. The human population was growing exponentially; resources were not.

Yet here we are, half a century later. The world population has continued to grow; hunger has not. In fact, the share of the world’s population living in absolute poverty has fallen by more than 50%. Far from the doomsday apocalypse that Ehrlich foreshadowed, we are now witnessing an “unprecedented era of global prosperity.”

So what has happened in the world since 1968 to render Ehrlich’s predictions so “comically bad,” in the words of one of his harsher critics? Quite simply, humanity managed to discover more and more ingenious ways of evading Ehrlich’s ticking population bomb. When Ehrlich predicted that food supplies would soon run out, the world discovered new ways to farm (increasing yields of some crops by as much as 100%). When Ehrlich predicted that economically recoverable reserves of petroleum stood stagnant, the world invented new methods of finding and recovering petroleum from untapped reserves (not to mention new sources of energy such as solar and geothermal). And when Ehrlich predicted that water scarcity would soon lead to a decrease in agricultural yields, the world invented new strands of water-efficient crops.

Yet the basic premise of Ehrlich’s prediction still holds true: if not managed responsibly, the Earth’s resources will eventually be depleted. Already, we are pushing the limits of what nature can reasonably sustain.

Decoupling refers to a theoretical future in which economic growth is maintained without the corresponding increase in environmental pressure. If we are to continue to prosper (and evade Ehrlich’s doomsday apocalypse), a rapid decoupling of consumption from the environmental depletion it has been associated with will be needed. The good news is: the world is once again rising to the challenge. From slow fashion to regenerative agriculture, the future of consumption is going to be sustainable.

Investors are important stakeholders in this transition. By providing growth and seed capital for sustainable innovation, they can directly finance the transition to a more sustainable economy. Likewise, by purchasing stocks in companies that are at the forefront of the transition, investors send an important signal to the market that sustainable production and consumption matter. Finally, investors who use their voice as shareholders play an important role in moving companies in a more sustainable direction.

This is not only good for the world. It is also good investing. From sustainable fashion to zero waste electronics, decoupling could unlock USD 4.5 trillion in potential opportunities per annum. With consumers expressing greater demand for sustainable products than ever before and regulators doubling down on transgressors, investors would do well to take note.

Imprint

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