

The Decade of Action

INNOVATION & SUSTAINABILITY

2030

www.itonics-innovation.com



A man with a beard and tattoos is holding a large globe of the Earth above his head with both hands. He is looking up at the globe with a smile. He is wearing a black t-shirt with a pink flamingo logo on the left chest. The background shows a cityscape with buildings and a body of water under a clear sky.

RETHINK. ACT. TRANSFORM.

With just ten years to reduce emissions, it is no surprise to see greater demand and a committed response from the private sector in the transition to a more sustainable future.

We are at the start of the “decade of action,” in which innovation and sustainability are inextricable from business strategy and shared value in the pursuit of continual success.

In the last decade, much progress has been made in prioritizing the sustainable business agenda. Though the transition has been slow, there has been a remarkable shift in mindset.

Most forward-looking businesses have come to realize that the traditional trade-off between sustainability and profitability no longer holds water. Meanwhile, consumers are increasingly calling for greater sustainability and transparency from brands, leveraging their buying power to demand responsible corporate citizenship.

At the same time, returns on sustainable technologies are growing, strengthening their business case. The fundamental tenets of good entrepreneurship – identifying the changing needs and demands of society, and responding with innovative business models – support business’s mandate to thrive and grow while simultaneously solving some of the world’s biggest challenges.

This report unpacks what a positive transition to 2030 might look like, exploring relevant trends and inspiring future scenarios to uncover innovation opportunities and increase climate action through advocated business response.

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HOW WE DO IT

*The complexity of the 21st Century calls for a holistic approach to **end2end innovation management**. Linking trends, technologies, and weak signals to innovation roadmaps, ITONICS supports strategic planning for cross-sectoral product, technology and resource management.*

By combining profound industry know-how and scientific expertise, the ITONICS trend management methodology provides the foundation to the development of disruptive innovations. Based on an 'outside-in' analysis, our research takes the impact of global social, technological, environmental, economic and political factors (STEEP) into account.

Through the rigorous contextualized **environmental scanning** and **IT-driven trend scouting** made accessible through our modular software suite, we explore key trends linked to sustainability that are impacting the current business landscape.

Looking forward to 2030, we synthesize our extensive research and trend content to consider new frontiers – extending our imagination to the future. In doing so we benchmark industry

knowledge with **strategic foresight** to examine the interplay of not-so-distant realities. Building on existing scenarios developed by international teams of climate scientists, economists and energy systems modelers, we consider a range of academically sound and widely-adopted plausible futures.

Frequently referred to as "business as usual", **the high-emissions 'RCP8.5' global warming scenario** demonstrates a single worst-case scenario of unchecked warming. In contrast, the "**Shared Socioeconomic Pathways**" (SSPs) employ a more dynamic view of the future to envision alternative pathways for the future.

While researchers have been more inclined to reference RCP8.5 to extrapolate the urgency for climate change action,

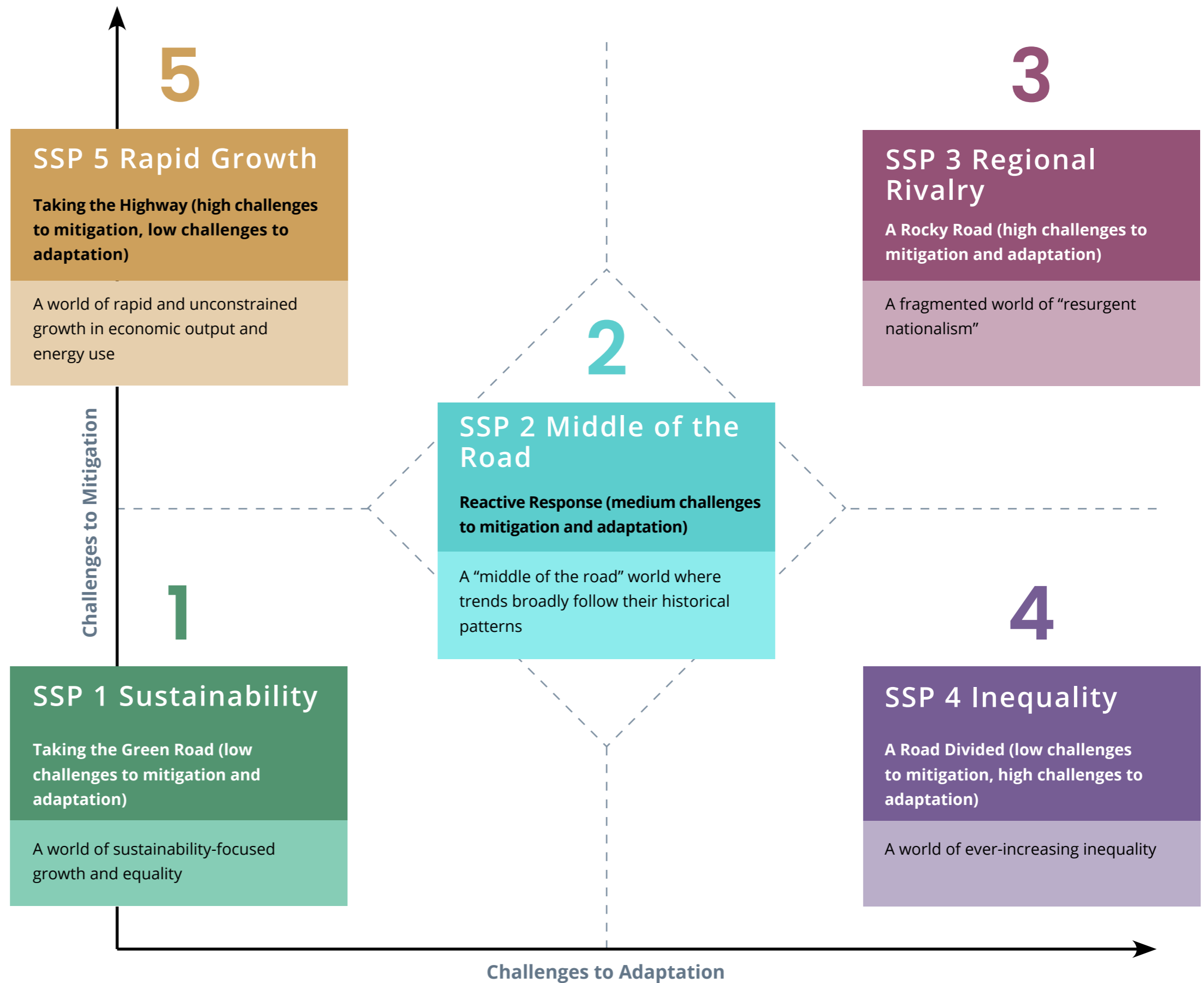
the multiple scenarios presented by the SSPs offer a more realistic range of baseline worlds.

Presented with the most potential for a positive future, we consider what the world might look like if we were to take **The Green Road** forward and uncover how these connections will influence business.

Adopting an 'inside-out' approach, we detail the implications for innovation. Evaluating the impact of these different scenarios on sector-wide strategies, we identify potential whitespaces that will help innovators engage in authentic dialogue with consumers and realize winning strategies. To leverage these insights, we provide a number of practical recommendations and highlight the changes incumbents could make to avoid risks and maximize opportunities.

THE “SHARED SOCIOECONOMIC PATHWAYS”

The narratives of the “Shared Socioeconomic Pathways” (SSPs) scenarios explore how societal choices and climate change interplay inextricably and therefore, represent how ambitions of the Paris Agreement could be met. They present baselines of what the world might look like in the absence of climate policy, and allow innovators to explore barriers and opportunities for climate mitigation and adaptation in each possible future world when combined with mitigation targets.



HOW TO READ THE REPORT

1.

Evaluate the current state of the industry

Setting the scene, we provide an overview of the **change in the world** with a specific lens on sustainability. We look to disruptive forces impacting industry and geographies while considering key **impact areas**.

Consider your organization's status in the context of current events. What are the immediate implications for change?

2.

Explore the changing world from the consumer's perspective

Highlighting key trends at play, we explore distinct themes as **forces shaping the future**. We reference pertinent examples where industry players have successfully responded to tangibly demonstrate the maturity of the respective trends. By exploring these shifts from a new perspective, we demonstrate how business expectations might evolve.

Use all [blue hyperlinks](#) throughout the document to better navigate through the report. Those highlighted pink provide additional external sources and lead you to the [ITONICS Cloud Innovation Platform](#); illustrating a view of [where to play, how to win and how to execute](#).

3.

Consider promising innovation spaces

Providing a **snapshot of the future**, we elaborate on plausible outcomes trends and technologies will have as they develop and mature in-market through various scenarios. We uncover some of the potential challenges and possible alternatives presented by this new world.

What does your organization look like in the context of this future? What opportunities might you leverage to deliver differentiated value?

4.

Apply recommendations to shape the future of your business

Contextualizing the future, we provide **implications for innovation** specific to sustainability, indicating strategies incumbents can adopt to remain relevant. With this in mind, we advocate various methodologies and practices to take **The Green Road** forward.

Using the framework provided, tailor the recommendations to your specific scope, strategic intent, and distinctive capabilities. Boldly innovate to shape the future!

FOREWORD

Over the past decade, the role of business in society has evolved. We have seen several trends both drive and accelerate this foundational shift. As these trends gain momentum, companies will be forced to reconsider strategy—and by virtue, innovation—through a new lens.

Investors, customers, employees, policy-makers, and society collectively have come to demand greater shared value; pressurizing business to align performance to sustainable and ethical business practices. Advances in technology have allowed organizations to actively play a part in addressing critical challenges such as inclusion and resource scarcity at scale and, without sacrificing profits. At the same time, great strides have been made in standardizing financially material ESG (Environmental, social and corporate governance) topics and performance data is becoming more available and reliable for transparent and accurate assessment of success.

Stakeholders now expect companies to express an authentic purpose and deliver triple bottom line growth by prioritizing profit, people, and the planet.

There is ample evidence of this transition with governments, businesses, and communities collectively uniting to confront the public health crisis the coronavirus pandemic has ensued. And yet, another threat to lives and livelihoods is still looming—climate change.

Having witnessed the devastating effects COVID-19 has had on the global economy, the urgency to act is amplified. With few people left unaffected by the pandemic, hitting pause has done more than compromise the global economy. It has brought long-term environmental, social, and economic sustainability concerns to the fore.

Though the task at hand is complex, it can no longer be ignored. Business leaders, strategists, and innovators are now confronted with a defining moment to act. Those that do so decisively have the opportunity to mitigate risk, build resilience, capture the true value of the sustainability imperative, and establish competitive advantage for their business models for the long term.

Survival, success, and sustainability in the next decade will be determined by the capacity to innovate, power to mobilize the required resources for action, and ability to communicate with full transparency.

At ITONICS we believe that a more sustainable future is possible. This report is aimed to inspire industry leaders to view strategy through a new lens and act decisively with the courageous leadership required to incite real change.

We invite you to engage in this dialogue with us and look forward to helping you shape the future.

Dr. Michael Durst

Founder and General Manager
ITONICS



EXECUTIVE SUMMARY

January 2020 marked the start of the Decade of Action: ten years to meet the goals outlined in the [UN 2030 Agenda for Sustainable Development](#) in a desperate endeavor to mitigate the impact of climate change.

As extreme climate events, soaring temperatures, rampant wildfires, and changing rainfall patterns become the order of the day, businesses and governments alike are awakening to the risk a world in climate crisis poses to their economic activity. The UN Development Program estimates that one out of every three dollars spent on development over the past 30 years has been lost to climate events, amounting to a loss of some [\\$3.8 trillion](#).

Against the backdrop of a global pandemic and a U.S. election that represents a

tipping point for global climate mitigation initiatives, the need to innovate toward a greener world and sustainable future has never been more urgent.

In this report, we examine three [impact areas](#) where deliberate action can make a difference, and dive deep into thirteen core themes or [forces shaping the sustainability landscape](#) categorized into three broad change areas. We then provide [a snapshot of the future](#), discuss the [implications for innovation](#), and provide [recommendations for action](#).



IMPACT AREAS

The path to sustainability is a journey that begins with awareness and rethinking individual actions, and then gradually takes steps towards an overall positive impact.

Climate Change Mitigation

Current global greenhouse gas emissions are in the region of **50 billion tons**, with the aim to halve emissions and limit global warming to 1.5°C in the next ten years. Current trajectories show us overshooting this mark and reaching 3-4°C temperature rises within this century.

Conserving Biodiversity

Human activity is contributing to record mass extinction rates, with more than 1 million species currently facing extinction. Businesses and governments are beginning to recognize the crucial role that intact natural ecosystems play in food security and economic sustainability.

Sustainable Development Goals (SDGs)

The UN Sustainable Development Goals serve as a roadmap for developing and developed countries – as well as private organizations – to implement measures to protect the planet while uplifting its people both now and in the future. The SDGs demonstrate the interconnectedness of the goals of promoting economic development, eradicating poverty, reducing inequality, preserving the natural environment, and mitigating climate change.

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FORCES SHAPING THE FUTURE

A number of global trends are shaping the global sustainability landscape, driving rise to innovative responses from businesses and new sustainability targets and regulations from governments.

I. The Conscious Consumer

As more information about the environmental impact of consumerism comes to light, consumers are becoming more mindful of the choices they make and placing increasing pressure on companies to make their operations and offerings more sustainable.

Sustainable Packaging

In recent years, single-use plastic has entered the spotlight as consumers have called on businesses to reduce packaging and make the packaging they do use biodegradable, reusable, or recyclable.

Sustainable Diets

As consumers seek to “vote with their dollars,” sustainable food options such as plant-based meat and dairy alternatives, alternative protein sources, and localized supply chains are gaining traction.

Sustainable Travel

In part due to the attention Greta Thunberg has brought to the concept of Flygskam or “flight shame” in recent months, there is a growing awareness of the emissions impact of travel and air travel in particular. Moreover, with the global travel slowdown precipitated by the coronavirus pandemic, many businesses are re-evaluating the necessity of business travel and consumers are increasingly turning their attention to local travel markets.

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II. Tech and R&D for SDGs

Technologies like advances in battery storage capabilities, next-generation mobile internet, data analytics, artificial intelligence, blockchain, the Internet of Things, and many others are giving rise to new ways to manage resource efficiency, promote supply chain transparency, and reduce emissions.

Electromobility

As governments around the world pass regulations governing the sale of combustion engine cars, electric vehicles are poised to significantly reduce emissions stemming from transport.

Revisiting Plastics

Around the world, governments and businesses alike are reconsidering their relationship with plastic, setting targets to reduce plastic use and increase recycling. Bioplastics offer a potential solution, but it's far from a clear-cut issue, as bioplastics come with their own set of challenges.

Sustainable Building Practices

Adopting architecture and construction strategies that reduce waste and improve resource efficiency can be an effective means of reducing the emissions resulting from buildings and non-renewable building materials.

Automating a Greener World

Using IoT sensors paired with AI can help businesses reduce emissions and waste by improving operational resource efficiency, not to mention prolonging the lifespan of machinery through predictive maintenance. Simple digitalization and workflow automation initiatives can also significantly reduce waste.

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III. Systems-Level Response

It's becoming increasingly clear that an integrated, high-level approach is needed to effect real change if we are to have any hope of meeting our sustainability targets.

Supply Chain Changes

Rethinking supply chains from the bottom up – from sourcing responsibly, to shortening the route to market, to improving transparency through tracking technologies – is needed to bring businesses into alignment with the Sustainable Development Goals.

Circular Solutions

It's becoming increasingly clear that integrating circular design into the ways we produce, consume, reuse, and recycle goods is vital to meeting our emissions reduction goals and building sustainable social, economic, and natural capital.

Resource-Efficient Solutions

Companies are facing regulatory and consumer pressure to make their operations more resource-efficient beyond carbon offsets by adopting measures that improve energy efficiency, promote responsible water use, and reduce emissions across the board.

Investing in Human Capital

Around the world, businesses are wising up to the fact that their employees are their most valuable assets and implementing measures to promote employee wellbeing.

Land-Use and Management

Agriculture, resource extraction, and other land-use changes are responsible for large-scale deforestation, wetland destruction, and land degradation, leading to significant increases in emissions. As such, there's a profound need to develop more sustainable land use and management strategies.

Sustainable Finance & ESG Investing

Environmental, social, and governance (ESG) criteria are becoming increasingly important considerations for investors and financial services providers, in part due to the heightened risk assessment potential these metrics offer.

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A SNAPSHOT OF THE FUTURE

Taking the Green Road

In this scenario, we explore a future world in which the UN SDGs are actively pursued and conscious consumerism becomes mainstream in a post-pandemic context.

Implications for Innovation

The risks associated with climate change can no longer be denied, which makes innovation not a luxury but an urgent necessity and opportunity.

Confronting Climate Risk Goes Beyond Compliance

Simply tracking ESG metrics for the sake of compliance is not enough. Businesses that holistically integrate ESG efforts into their business strategy and innovation efforts, going over and beyond the benchmarked goals, will gain a competitive advantage by being ahead of the curve.

Sustainability Issues are Inherently Systemic

Applying outdated deterministic mental models to the inherently complex and multifarious issue of sustainability is insufficient. For real progress, businesses will need to change their mindsets, processes, operating models, and the tools they use to embed systems-thinking into their decision-making processes.

Next-Practice Platforms will Pave the Way Forward

In order to realise significant change business must question standard operating procedures and the status-quo. "Next practices" are practices that seek to bring about systemic paradigm shifts by introducing better ways of doing things, triggering an individual and collective re-evaluation of the old way of doing things.

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RECOMMENDATIONS

1

Benchmark current capabilities and initiatives with emerging compliance & regulations

2

Understand physical climate risks across geographies and industries

3

Align strategic goals to coincide with international imperatives

4

Reevaluate and optimize the value chain and full lifecycle

5

Embed good stewardship into product and service design

6

Monitor and manage new measures of performance

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SETTING THE SCENE



We're witnessing climate tipping points around the world: whole continents fighting massive wildfires, the rapid loss of the Arctic and Antarctic ice sheets, coral reef die-offs, increased hurricane activity, flooding, droughts, and heatwaves – all exacerbated by rising global temperature averages. Scientists predict that this is the new normal, at best. At worst, it's going to get much, *much* worse.

As these extreme weather events become more frequent and more data about their impact on communities and economies become available, businesses will face growing consumer and regulatory pressure to play their part to mitigate the escalating climate crisis. Climate-resilience will become a crucial consideration throughout operations and value chains and investors will increasingly expect climate

risk assessments as the climate becomes a more urgent concern. The United Nations Development Program estimates that over the last 30 years, one out of every three dollars spent on development has been lost to extreme climate events – a total loss of **\$3.8 trillion**.

This new decade will decide the future of life on this planet, not only for humans but for all life on earth. We have ten years to transform the way we do business, the way we eat, the way we shop, the way we use energy and get around – in short, every aspect of our lives needs to change to be more sustainable if we are to have any hope of slowing the effects of climate change.

Below, we'll discuss some of the major events and forces currently shaping the conversation around sustainability.

Climate change is no longer in question. Around the world, we are witnessing and feeling its very real effects. The focus now is on how businesses and government will respond to this new reality in the next ten years – the Decade of Action.

Historically High Temperatures



California's Death Valley recorded [130° F](#) (54,4° C) temperatures in August – the highest temperatures ever recorded on the planet. Heatwaves killed dozens of people in [Arizona](#) when it too recorded [record high temperatures](#). As heatwaves around the world become more severe, we can expect to see more [fatalities](#) in the coming years if adequate measures are not taken. Projections show that even if we cut emissions drastically, [one-seventh](#) of the world population will suffer life-threatening heatwaves on occasion. Failure to do so doubles or triples that number.

U.S. Election

The Trump Administration has caused major setbacks to climate action progress, with a long [list](#) of regulatory rollbacks on policies aimed at reducing the emissions and environmental impact of industry. In his early months in the White House, President Trump announced plans to withdraw from the [Paris Accord](#). As he has not been reelected, most likely the White House will commit to its original policies before the Trump administration.



COVID-19

The widespread lockdowns and resulting curtailment of economic activity and mobility around the world in the first quarter of 2020 caused an energy demand reduction of **3.8%** compared to the first quarter of 2019. Global carbon emissions were likewise 5% lower in Q1 2020 than Q1 2019, and **satellites** orbiting the Earth documented a visible decrease in emissions. While inspiring, these reductions were short-lived and won't make much difference in the long run. **Scientists** say that large-scale, systemic interventions are required to make a significant impact on the world's current climate trajectory.



Rampant Wildfires



Catastrophic wildfires cause drastic increases in carbon emissions. For instance, Australia's fires in 2020 caused the country's annual carbon dioxide emissions to effectively **double**. As temperatures rise and rainfall and wind patterns change, these massively destructive fires are expected to become **more frequent and more severe**. Projections show that a 1°C temperature rise could increase the median burned area by up to **600%** in the Western U.S.

IMPACT AREAS

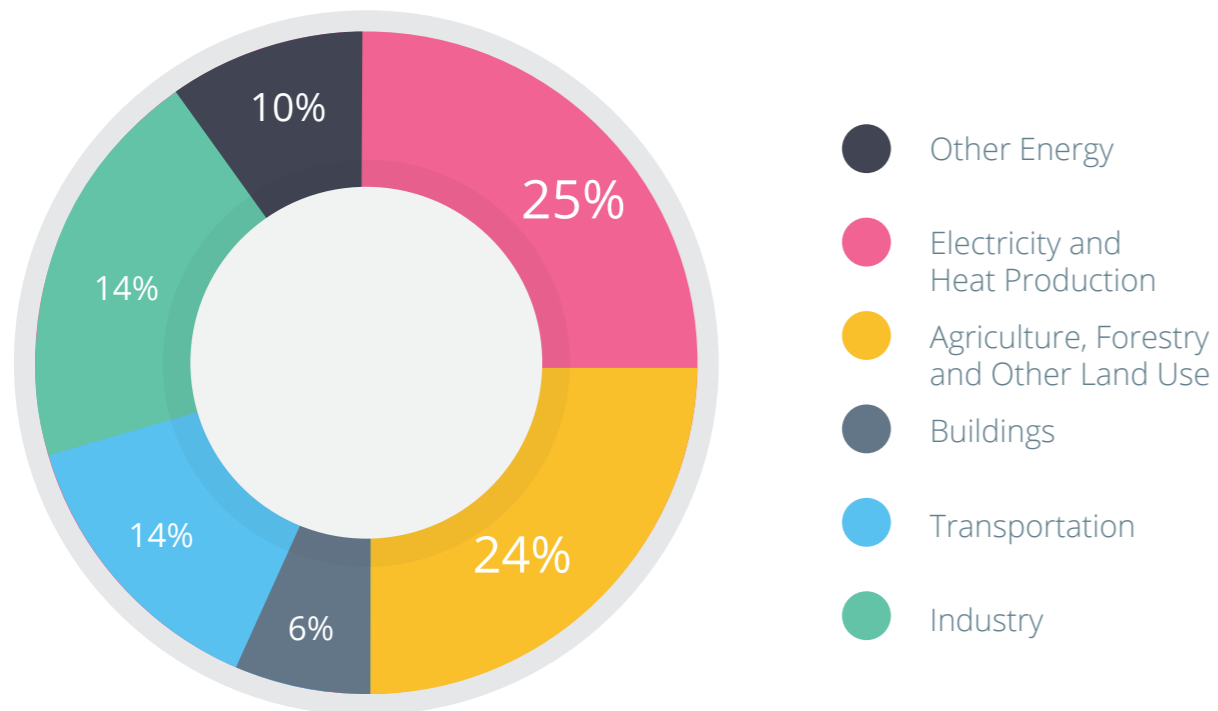
CLIMATE CHANGE MITIGATION

In order to prevent catastrophic climate change that would disrupt every aspect of life on earth, we need to collectively reduce global greenhouse gas (GHG) emissions. The world currently emits some 50 billion [tonnes of greenhouse gases annually](#). A small number of countries are responsible for the bulk of GHG emissions. The top ten emitters are responsible for more than two-thirds of annual emissions. The world's largest polluters remain China ([26%](#)) and

the U.S. (13%) and four broad industries are responsible for the bulk of GHG emissions: Transport, electricity & heating, agriculture & forestry, and manufacturing & construction.

The current aim is to halve global greenhouse gas emissions and maintain global warming at 1.5°C within the next 10 years. However, current trajectories put us on track to overshoot this target, hitting 3-4°C increases in this century.

Global Greenhouse Gas Emissions by Economic Sector



Source: Global Greenhouse Gas Emissions by Economic Sector, IPCC



Signs Of Change

- Microsoft has launched a \$1 billion [Climate Innovation Fund](#) and aims to be [carbon negative](#) by 2030, without resorting to carbon offsets.
- Brazil and India have reached an [agreement](#) to work together on bioenergy production using surplus crops.
- According to a recent IMF [report](#), coal, oil, and gas currently receive pre-tax and post-tax subsidies worth more than \$5.2 trillion per year. According to the [International Institute for Sustainable Development](#), reallocating just \$100 billion of these existing subsidies to clean energy initiatives would double subsidies for renewable energy.

CONSERVING BIODIVERSITY

Plant and animal species are facing record mass extinction rates due to human activity. A recent UN report found that close to a [million](#) species – or one in six – currently face the threat of extinction. Many governments have failed to deliver on biodiversity targets set in Japan in [2010](#), such as declaring 17% of land as protected areas.

It's important to recognize that intact natural ecosystems play a crucial role in economic sustainability.

Biodiversity and functioning complex ecosystems are not a “nice to have” – they’re essential to economic activity, and indeed, the continuity of human life on this planet.

The private sector is just now starting to recognize the devastating impact loss of biodiversity will have on the global economy. In combination with robust climate change mitigation efforts, holistic, collaborative approaches are needed to improve the way we manage and use natural resources to limit ecosystem collapse.



Biodiversity conservation initiatives are often underfunded because traditional financial analysis models rarely take environmental, social, and health impact into account. This is a mistake. Using the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) framework – Nature’s Contribution to People ([NCP](#)) – the WWF’s [Living Planet Index](#) estimates the economic value of nature at some \$125 trillion per year.

Knowing the value of natural assets in financial terms may help drive conservation efforts, particularly by businesses in tourism-adjacent industries.

In 2021, China will hold The 15th meeting of the Conference of the Parties ([COP 15](#)) to review the delivery on the [Convention on Biological Diversity](#) (CBD)’s Strategic Plan for Biodiversity 2011-2020 and create the biodiversity framework for years to come. It is anticipated that topics of discussion will include capacity building and resource mobilization.

The hope is that COP 15 will be a catalyst for heightened global efforts to improve conservation efforts, slow ecosystem destruction, and mitigate the impact of rising temperatures.

With rising temperatures and changing rainfall patterns, fire-prone areas are more vulnerable than ever to destructive wildfires that pose a huge risk to biodiversity. The fires in Australia alone killed more than [three billion](#) animals, many of them rare and endangered species not found elsewhere on Earth.

[Rising ocean temperatures](#) pose a risk to marine ecosystems and biodiversity – as well as human food security. Warmer oceans result in acidification and coral bleaching, and loss of breeding habitat for fish and marine mammal species. Limiting the global average temperature increase to below 2°C and establishing more marine protected areas to prevent [overfishing](#) is vital to preventing the devastating impact ocean warming will have on marine biodiversity.

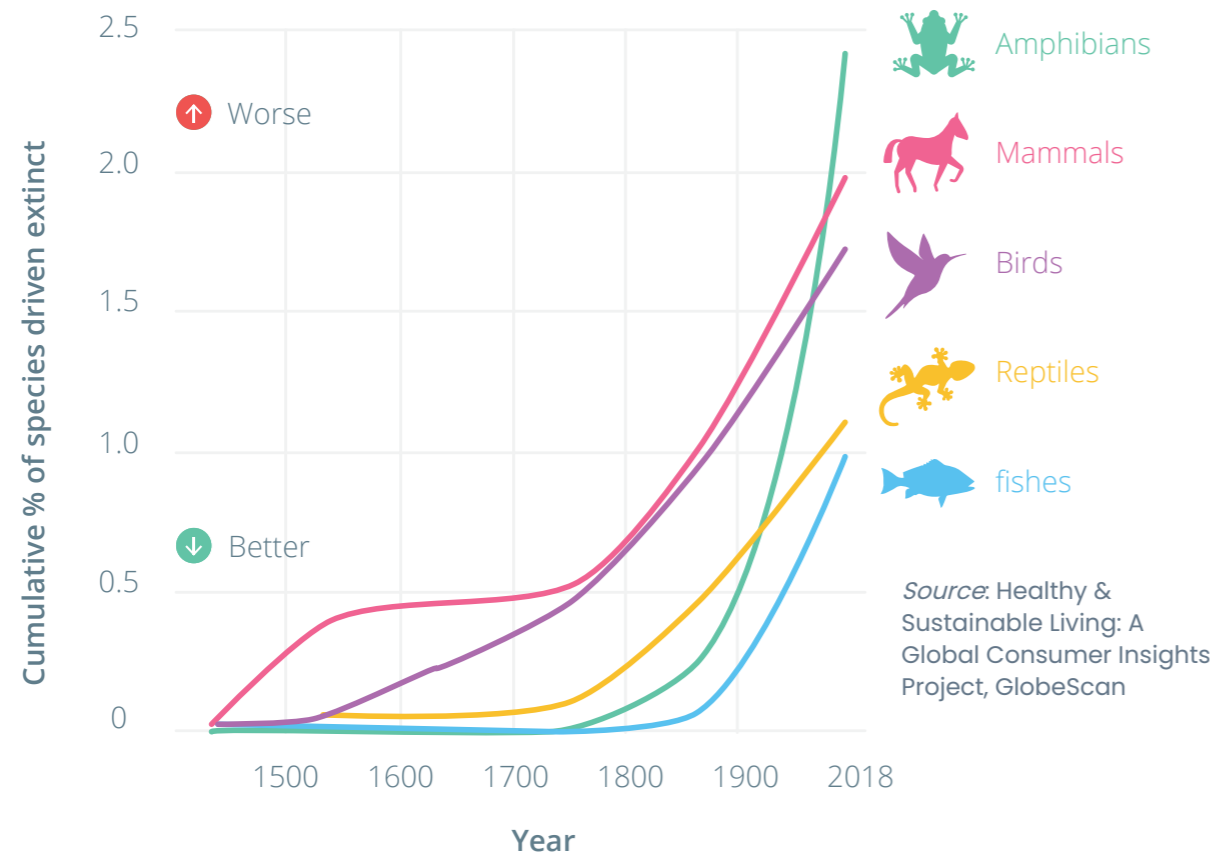
Pollinator decline due to pesticide use, habitat loss, invasive species, and diseases pose a threat not only to [bee populations](#) but to our survival as a species. It’s not just bees, either.

A recent study estimates that up to [40%](#) of the world’s insect species are at risk. Indigenous species struggle to compete with invasive [aliens](#), resulting in dramatic losses to biodiversity when colonizing species monopolize formerly complex ecosystems.

Signs Of Change

- US Airline [JetBlue](#) recently partnered with [The Nature Conservancy](#) to put a number on the economic impact of Caribbean coral reefs through tourism. The number? [\\$7.9 billion](#) (or 11 million tourists) per year.
- For some time, mining company [Rio Tinto](#) has been collaborating with the World Business Council For Sustainable Development ([WBCSD](#)) to manage biodiversity conservation efforts. Together, they've launched a biodiversity [strategy](#) aiming for a net positive impact on biodiversity, working with scientists and indigenous communities to minimize the impact of the company's mining activities.
- In 2019, in the lead-up to Climate Week New York, [230](#) institutional investors (representing some \$16.2 trillion in assets under management) urgently called on companies to tackle deforestation.
- Investors including [BNP Paribas](#), HSBC, Rabobank, and Credit Suisse have implemented detailed policies to address deforestation.
- [Apple](#) partnered with [Conservation International](#) to conserve and restore [27,000 acres](#) of mangroves in Colombia. In addition to reducing the impact of tropical storms and providing a habitat for local fish stocks, mangroves sequester large quantities of CO2 – around 1 million metric tonnes, in this case.

Cumulative % of species based on background rate of 0.1-2 extinctions per million species per year



SUSTAINABLE DEVELOPMENT GOALS

The United Nations' Sustainability Goals form the core tenets of the [2030 Agenda for Sustainable Development](#), adopted by the Member States of the UN in 2015. It provides a blueprint and call to action for developed and developing countries alike to implement measures that promote peace and prosperity for people and the planet – both now and in the future.

The SDGs acknowledge that facilitating economic prosperity and ending poverty goes hand-in-hand with strategies that reduce inequality, improve health and education, and drive economic growth – while taking action against climate change and endeavoring to preserve the natural environment.



FORCES SHAPING THE FUTURE



I THE CONSCIOUS CONSUMER

- Sustainable Packaging
- Sustainable Travel
- Sustainable Diets



II TECH AND R&D FOR SDGS

- Electromobility
- Revisiting Plastics
- Automating a Greener World
- Sustainable Building Practices



III SYSTEMS-LEVEL RESPONSE

- Land-Use and Management
- Circular Solutions
- Supply Chain Changes
- Resource-Efficient Solutions
- Investing in Human Capital
- Sustainable Finance & ESG Investing





THE CONSCIOUS CONSUMER



Consumers who are concerned about climate change and ecosystem collapse – particularly Millennials and Gen Z – are increasingly “voting with their wallets”, supporting brands and products that embody sustainability principles.

However, intentions and outcomes don’t always align. A recent GlobeScan study found that while more than 54% of respondents (25,000 consumers across 25 countries) feel that it’s important to live in a way that’s good for the environment, themselves, and others, only 37% reported currently living this way.

Assessment of One’s Lifestyle

Average of 25 Countries, 2019

Major or large priority of living in a way that is healthy and sustainable

54

Currently mostly or completely living in a way that is healthy and sustainable

37

↕ Intention-behavior gap (17 points)

Source: GlobeScan (2019)

Unfortunately, eco-friendly products are often more expensive than the alternatives, which means that many consumers who would like to choose the environmentally-responsible option end up falling short. In short, sustainable living is currently aspirational and not always accessible.

In order to close this intention-behavior gap, there’s a need for greater systemic support to make sustainable choices affordable. Time, effort, and impact awareness are other issues that impact consumers’ ability to live up to their health and sustainability aspirations.

As conscious consumers put more pressure on businesses to align their values and practices with their own, a growing number of companies are making changes to their sourcing, distribution, packaging, operations, and offerings.

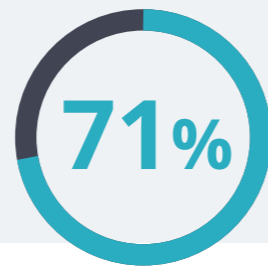
This type of systemic change is not without its challenges. For instance, companies seeking to increase their recycling efforts may not have easy access to used products. Getting products back from consumers to reclaim usable materials can be difficult, whether they be plastic bottles or old iPhones. Closing the recycling loop will require new approaches to collaboration and incentivization.



New York University's Stern Center for Sustainable Business [found](#) that 50% of consumer packaged goods (CPG) in the U.S.'s growth between 2013 and 2018 stemmed from sustainably-marketed products.



Pinterest [reported](#) a massive surge in searches relating to sustainability in 2019, with "sustainable living" growing by 69% and "sustainable living for beginners" surging by 265%.



71% of UK respondents [surveyed](#) by ING said that slower economic growth is a price worth paying if it protects the environment.

THREDUP
YCLOSET

US-based [thredUP](#) and Chinese [YCloset](#) offer consumers and retailers alike a way to upcycle their clothes and fight back against the environmental scourge of fast fashion.

Related Trends



Sustainable Packaging

Consumers are becoming more mindful of the impact of their consumerism and more critical of product packaging, carefully considering which materials were used and whether they can be disposed of in a safe and environmentally responsible manner.

Increasingly, consumers expect packaging that is made from sustainable resources, or that can be reused, recycled, or composted. They are also placing enormous pressure on brands to use less packaging material altogether through highly publicized boycotts and protests. In this consumer landscape, retailers that have placed health and sustainability at the core of their business model are thriving.

In January 2018, UK-based supermarket chain [Iceland](#) pledged to go plastic-free on its own-label range, and [Pret A Manger](#) doubled its discount for customers bringing reusable cups to 50p. More than 120 companies – including Tesco, Lidl, Marks and Spencer, Waitrose, J Sainsbury, Unilever, Procter & Gamble, and Coca-Cola – governments and local authorities have signed the [UK Plastics Pact](#) to ditch unnecessary and problematic single-use packaging by 2025.

ULTA
BEAUTY

Cosmetics company [Ulta Beauty](#) has launched an overarching sustainability initiative dubbed [Conscious Beauty](#) which aims to achieve 50% recycled, refillable or bioplastic cosmetics containers by 2025.

LUSH FRESH
HANDMADE
COSMETICS

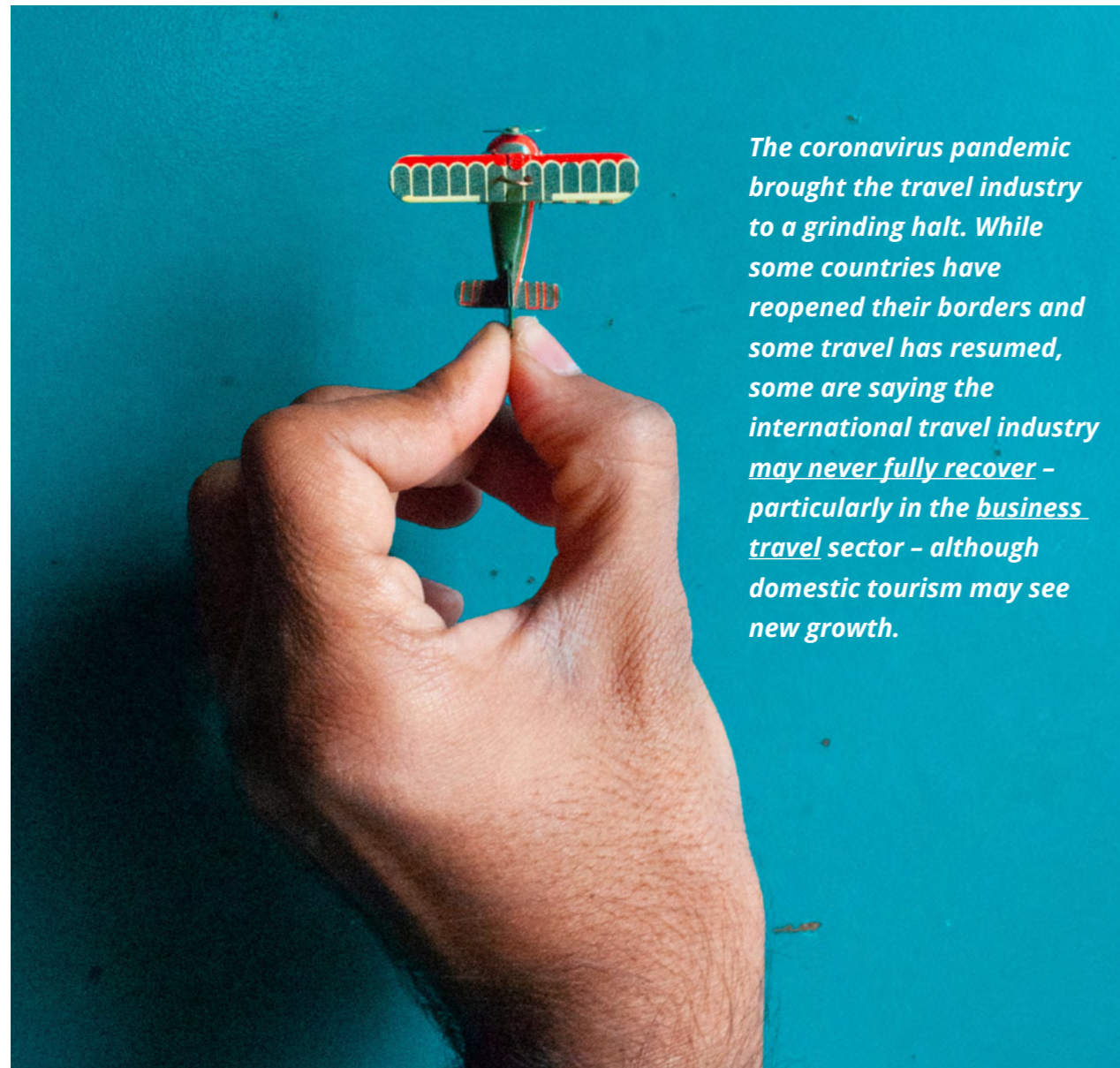
UK cosmetics company [Lush](#) has been championing packaging-free cosmetics and hygiene products through its [Naked](#) range for several years.

IKEA

In 2019, furniture giant [IKEA](#) introduced compostable [fungus-based packaging](#), replacing non-recyclable styrofoam packaging materials.

Loop

[Loop](#) is an online store with a twist: all the packaging is returnable. Customers pay a fully-refundable deposit on the packaging, which [Loop](#) collects, cleans, and reuses.



The coronavirus pandemic brought the travel industry to a grinding halt. While some countries have reopened their borders and some travel has resumed, some are saying the international travel industry may never fully recover – particularly in the business travel sector – although domestic tourism may see new growth.

Sustainable Travel

For more than six decades, international tourism has seen sustained growth, resulting in a \$2.3 trillion contribution to global GDP in 2019. The downside? The tourism industry's carbon footprint accounts for about 8% of global greenhouse gas emissions, largely driven by high-income countries while placing undue strain on lower-income countries.

Before the travel restrictions resulting from COVID, travelers were beginning to take action to reduce the impact of their travels, in part due to the widely publicized efforts of activists like Greta Thunberg and Extinction Rebellion. Flygskam or “flight shame” reportedly contributed to a 4% drop in commercial passengers flying in Sweden in 2019.



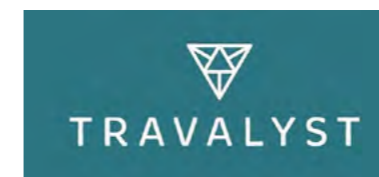
Dutch airline KLM launched a “Fly Responsibly” campaign in 2019 asking people to fly less.



Budget airline EasyJet is aiming to become the first major airline to pledge to operate net-zero emissions flights.



The EU is reportedly considering following France's lead of implementing an eco-tax on aviation to curb emissions. It seems likely that sustainable aviation initiatives will see massive growth in the coming years as airlines strive to cut carbon emissions and appeal to sustainability-minded travelers.



Travalyst is a new venture that seeks to promote “travel as a catalyst for good”. Led by the Duke of Sussex, Travalyst combines the powers of Booking.com, Skyscanner, Trip.com, Tripadvisor, and Visa with the aim to find ways to change the impact of travel to a positive one.



Google Flights now allows travellers to filter flight search results by CO2 emissions.



As awareness of the impact of livestock agriculture grows, consumers are increasingly embracing more sustainable diets, opting for plant-based foods.

Sustainable Diets

Plant-based proteins and meat alternatives are seeing significant investment, giving rise to abundant product development. It's expected that the U.S. market for plant-based meat alternatives like Beyond Meat and the Impossible Burger will grow to **\$85 billion** by 2030, with plant-based dairy alternatives projected to rise to \$37.5 billion by 2025.

In response to the increased demand for plant-based alternatives, **fast food chains** like Burger King and KFC have started offering these options as part of their core menus.

Despite the recent explosion of plant-based proteins, global meat consumption continues to grow. It's no secret that the animal products industry is an ecological disaster, with global livestock accounting for **14.5%** of all greenhouse gas emissions resulting from human activity. In order to effect real change, players in the food industry will need to take a broader approach and implement mitigating solutions throughout their existing meat and dairy supply chains.

Localized supply chains are another way retailers and restaurants can make their food offerings more sustainable, particularly by supporting small-scale farmers that use environment- and soil-friendly growing techniques like permaculture and organic farming practices.

*Nestlé has unveiled a new vegan tuna range dubbed **Vuna** made primarily from pea protein, after revealing that plant-based alternatives sales reached £168 million (\$214 million) in 2019.*



*Alternative protein sources like **algae** and **insects** are steadily gaining mainstream traction.*



*In what could be a major breakthrough for the lab-grown meat industry, **KFC Russia** has succeeded in using 3D bioprinting technology to create real chicken meat from cell cultures.*



*According to the Good Food Institute, **11.9%** of U.S. households buy plant-based meat alternatives, up from last year's 10.5%. North American sales of meat replacements grew by **37%** between 2017 and 2019.*



*Utah start-up **Grogrub's** app enables health-conscious consumers purchase or lease a 12x12ft plot of land and design their own fruit and vegetable garden, which is planted and managed by staff at the farm.*





TECH AND R&D FOR SDGs



Advances in technologies – such as next-generation mobile internet, artificial intelligence, automation, data analytics, the Internet of Things, blockchain, and alternative energy production and storage – hold the power to address and alleviate some of our most pressing and complex environmental and social problems, bringing us closer to achieving the Sustainable Development Goals.

For instance, [CrossBoundary](#) has proposed a mini-grid solution to the fact that more than 600 million people in Africa alone lack access to electricity. The proposed solution could supply at least 100 million people with affordable renewable energy at a cost of \$11 billion using solar energy, blockchain, AI, and advanced energy storage technologies.

In further support of the SDGs, closing the digital gap and raising internet penetration in every developing country to 75% of the population would create in excess of 140 million jobs and contribute as much as \$2 trillion to their GDP, according to [World Bank](#) estimates.

By investing in creative solutions and technologies that help to reduce emissions and promote resource efficiency, the business sector has the opportunity to advance the UN sustainable development goals in 2021 and beyond.

In more than 23 sub-Saharan countries, [drones](#) are being used to advance the agriculture, mining, and healthcare industries through the remote delivery of goods, surveillance and infrastructure maintenance.

AI applications in the agriculture, transport, water, and energy industries have the potential to reduce global GHG emissions by 4%, increase global GDP by \$3 trillion, and create 38 million jobs by 2030, according to a recent [PwC study](#).

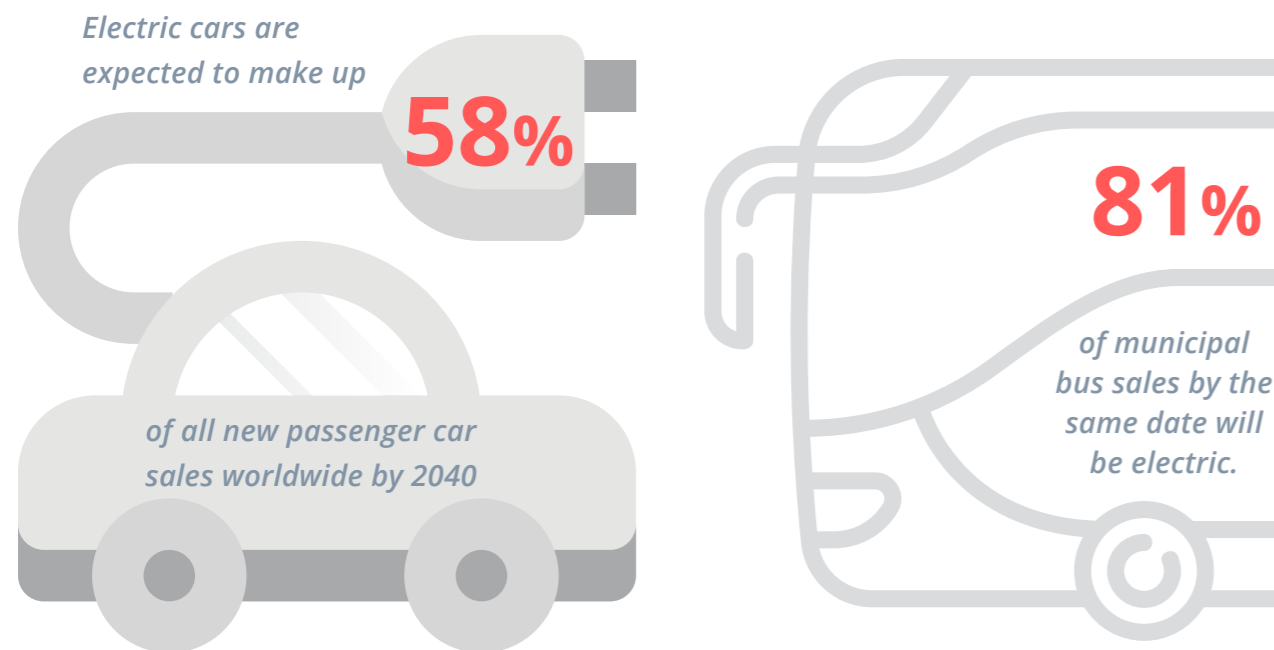
Since 2018, Walmart has been testing the use of [blockchain](#) to increase supply chain transparency for fresh produce to reduce the risk of food-borne diseases.

Indonesian startup [HARA](#) is using blockchain and data analysis to help local farmers become more resource-efficient and productive by collecting and analyzing data relating to soil health, fertilizer and pesticide use, weather patterns, and crop yields. In the future, HARA plans to harness IoT capabilities and use satellite data to further improve its capabilities.

Related Trends

Electromobility

Electric vehicles (EVs) will play a crucial role in curbing greenhouse gas emissions and meeting international climate change mitigation targets. Globally, transport is responsible for approximately a [quarter](#) of CO2 emissions.



Sources: Chilling trend: A longer, deadlier pandemic, Axios; Electric Models To Dominate Car Sales By 2040, Wiping Out 13m Barrels A Day Of Oil Demand, Forbes

We have entered the age of the electric car. Around the world, manufacturers are embracing electric drivetrains across all types of vehicles, driven by both the need for carbon footprint reduction and technological advances including improved – and more affordable – battery life and charging capabilities.

This change is in part driven by regulatory changes that seek to lower emissions. A growing list of countries and jurisdictions have begun implementing bans on sales of new internal combustion engine (ICE) vehicles. The State of [California](#) recently announced a ban on the sale of new ICE vehicles as of 2035, joining the likes of Canada, the Netherlands, Germany, the United Kingdom, Singapore, and [many others](#).

Simultaneously, more and more countries are offering [tax incentives](#) for EVs, which has boosted sales and competition, although these subsidies are often tied to price, range or specific sales quotas.



At a time when few other major automakers were active in the highway-legal EV space, [Tesla](#) released its completely electric Roadster. In 2017, Tesla became the most valuable car company in the U.S. Whereas the EVs that came before had suffered from perceptions of lacking power and not being particularly sexy, Tesla succeeded in making electric vehicles popular by creating an EV with the horsepower and luxury appeal of a sports car. Tesla now has plans for a \$25,000 EV in the pipeline.

Investor appetite for EV companies is off the charts. Relatively unknown SPI Energy recently announced the launch of an EV unit, causing its shares to jump by some [4,000%](#).

Nissan's Leaf hatchback's emissions have been calculated to be as much as three times lower than those of a traditional car, and a new Nissan Leaf repays the emissions arising from its battery production [within two years](#).

Vaya Africa, a ride-hail mobility venture, has launched an [electric taxi service](#) and charging network in Zimbabwe with plans to expand across the continent. The South Africa headquartered company has acquired a fleet of Nissan Leaf EVs and developed its own solar-powered charging stations.

Revisiting Plastics

One million plastic bottles are bought every minute or about **20,000** per second - around the globe.

Of the **5,800** million tons of plastic waste produced between 1950 and 2015, **only 9%** was recycled.

The growing global population and on-the-go consumer lifestyles, which generate vast quantities of disposable packaging, are resulting in sky-high plastic pollution levels, threatening both land and sea life. The widespread use of plastics has surpassed that of all other man-made materials except cement and steel. Globally, manufacturers produced **359 million** metric tonnes of plastic in 2018, compared to 1.5 million tonnes in 1950. In Europe, only around **30%** of plastic waste gets recycled. Single-use plastic is projected to increase by **40%** over the next decade, and more than **1.3 billion tonnes** of plastic waste will enter the world's oceans and landfills in the coming two decades unless large-scale interventions take place.

Brand owners and retailers are facing mounting consumer pressure to reduce their environmental impact and embrace more sustainable packaging solutions. Single-use plastics in particular (straws, packaging, eating utensils, etc.) have increasingly come under fire, becoming the subject of brands' corporate citizenship goals and government regulations alike.

As more environmental research emerges, the trade-offs inherent in manufacturing choices are becoming more apparent. This raises difficult questions around how to respond when emerging evidence casts doubt on processes and products previously considered environmentally sustainable. Iconic outdoor-wear brand **Patagonia** faces this dilemma. With its brand identity rooted

in environmental activism, the brand led the use of recycled plastic bottles in its fleeces. Now it - along with other apparel makers - faces evidence that tiny synthetic fibers, shed in the wash, are polluting the oceans and entering the food chain as microplastics.



Since the outset of commercial plastic production in early **1907**, the uncontrolled disposal of plastic waste has been causing environmental and health problems worldwide. As global awareness of the dangers posed by plastic pollution grows, many municipal, regional, and national governments are starting to take action.

In July 2017, the global recycling industry was completely disrupted when the Chinese government announced that it would phase out and **ban imports of recycling waste**. China began importing secondary raw materials in the **1980s** to supply its surging demand for raw materials for manufacturing. It soon grew to become the world's largest importer of recyclables, buying around 60% of plastic waste exported by G7 countries by mid-2017.

Following the announcement, imports had dropped to 10% by the end of 2017; and at the start of 2018, the country implemented an **import ban** on 24 types of recyclable materials, including plastics, as part of an environmental reform movement dubbed 'National Sword' designed to deal with the country's own growing waste problems. Prior to the ban, some 95% of the plastics collected for recycling in the European Union and 70% from the U.S. were sold and shipped to Chinese processors for recycling.

On the heels of China's ban, recyclable waste found its way to smaller markets in Southeast Asia. In the first half of 2018, imports of plastic trash increased by 56% in Indonesia, doubled in Vietnam, and rose in Thailand by **1,370%**, while Malaysia became the world's biggest importer of plastic scrap. Its import volume is now double that of China and Hong Kong, according to an **analysis** of trade data by the Financial Times.

Sources:

1: A million bottles a minute: world's plastic binge 'as dangerous as climate change', The Guardian

2: A whopping 91% of plastic isn't recycled, National Geographic

These countries currently lack the capacity to deal with this influx of waste. As a result, they are already considering implementing their own restrictions. Meanwhile, most of the waste management that stepped in to handle the extra plastic waste have already reached their legal limits.

There is an urgent need for investment in plastic recycling infrastructure and plastic reduction measures around the world. Unfortunately, it will take time to establish such infrastructure, and in the meantime, much plastic waste is being incinerated or ending up in landfills and waterways.



The [World Economic Forum](#) and the [Ellen MacArthur Foundation](#) predict that without critical action, there will be more plastic than fish in the ocean by 2050, threatening marine biodiversity and posing a risk to human health.

According to the [‘Future Agenda 2025’](#) report, plastic waste has been found in the digestive systems of at least 267 different species of water animals, and 80% of marine pollution comes from land-based activities.

A 2015 [study](#) by a team of researchers from the University of California, Davis, and Hasanuddin University, found man-made debris in 25% of seafood market fish, and 67% of all species sampled in the U.S. Part of the problem is that about 40% of the planet’s surface is ocean that belongs to no country in particular and is mostly unregulated, with few countries willing to step in and take responsibility.

Unfortunately, the COVID-19 pandemic has only [made matters worse](#). Aside from the massive amounts of personal protective equipment like masks, gloves, and coveralls used daily, safety concerns have led many people to turn away from reusable products and caused a spike in single-use plastics. Rampant online shopping and grocery deliveries have also resulted in larger amounts of packaging waste across the board. Meanwhile, waste management systems have also suffered disruptions and [cut prices](#) for recyclates.



Forward-thinking brands are responding to this pressure by embracing environmentally-friendly alternatives such as packaging-free solutions, refillable packaging solutions, bioplastics and ramping up recycling schemes and circular economies. Meanwhile, less scrupulous brands are resorting to ‘greenwashing’ tactics that attempt to win eco-conscious consumers’ loyalty through minor changes and effective marketing, without making real improvements to the sustainability of their practices.

According to a comprehensive sector [survey](#) by Greenpeace International in late 2018, FMCG corporations are the predominant driving force behind the throwaway economic model fuelling the plastic pollution crisis. While a growing number of FMCG companies worldwide are committing to ‘100% recyclable packaging’ goals, watchdogs like Greenpeace remain sceptical, saying that this is not enough, and that these companies must do more to ensure that their product packaging actually gets recycled. This global issue requires brands to actively reduce plastic waste and pollution, incorporating reclamation initiatives and recycling into the production process, and transitioning to circular business models.





CIRCULATE CAPITAL

DANONE
ONE PLANET. ONE HEALTH

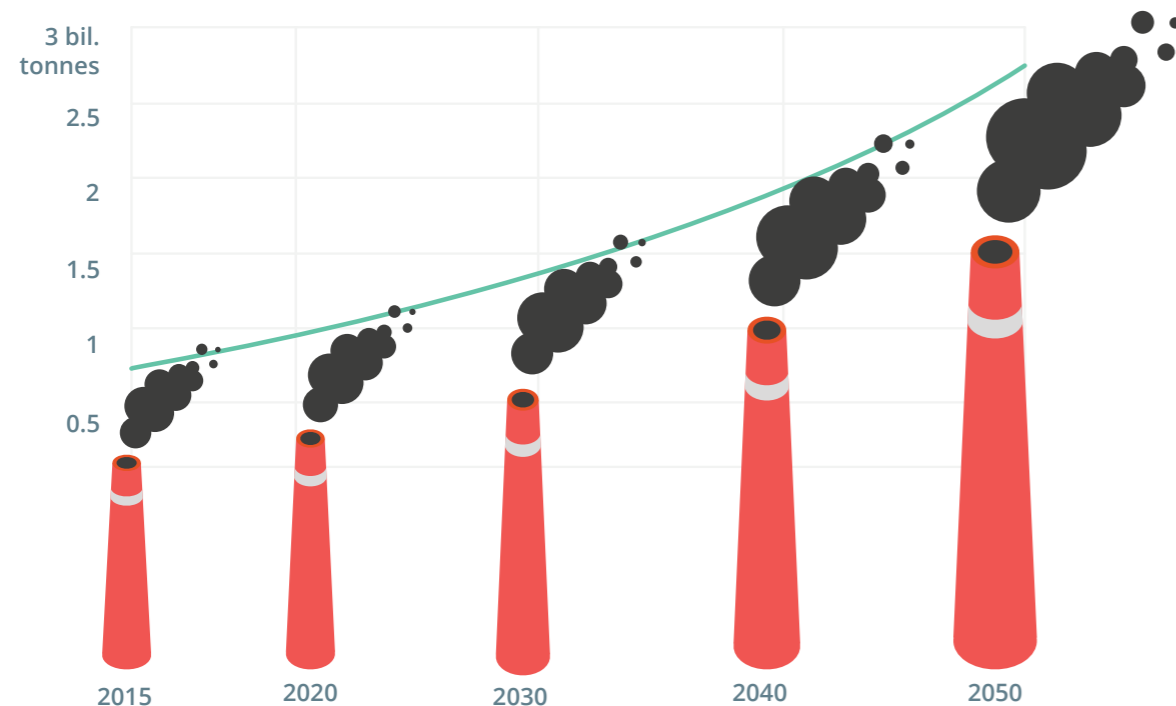
The recently launched \$106 million *Circulate Capital Ocean Fund* is dedicated to preventing ocean plastic waste in South and Southeast Asian waters, providing equity and debt financing for waste management and circular economy initiatives.

Danone has launched an *Ecosystem Fund* in the markets where it found its products to have the lowest recycling rates (Argentina, Mexico, Brazil, Ghana, and Indonesia) to facilitate the collection, sorting, and selling of plastics to recycling plants.

Carlsberg made waves with its glued-together *snap pack*, which uses small dots of glue to hold its six packs together instead of plastic rings or shrink wrap, preventing approximately 1,200 tonnes of plastic waste per year.

In 2018, Nestlé opened the *Institute of Packaging Sciences* in Switzerland to drive R&D to help achieve its goal of making 100% of its product packaging recyclable by 2025.

Annual CO₂ emissions from the production and incineration of plastic



Source: Annual CO₂ emissions from plastic could grow to more than 2.75 billion tonnes by 2050, [Guardian](#)

Bioplastics

Bioplastics are made by obtaining natural polymers from renewable biomass sources, such as vegetable fats and oils, corn starch, sugar cane waste, straw, sawdust, recycled food waste, and more, as opposed to petroleum-based plastics.

Bioplastics can biodegrade, are carbon-neutral, and can offer energy savings in production. Some are even compostable, making them easy to dispose of.

However, many bioplastics require specific conditions – such as moisture and temperature levels – to properly biodegrade, and these conditions are usually not met in landfills, where the majority of bioplastics still end up. Another drawback is, if not disposed of correctly, bioplastics can ‘contaminate’ recycling batches of other plastic, leading to the entire batch ending up in a landfill.

While bioplastics are certainly better for the environment, they are not a silver bullet and their use requires a number of supporting measures to ensure optimal effectiveness.

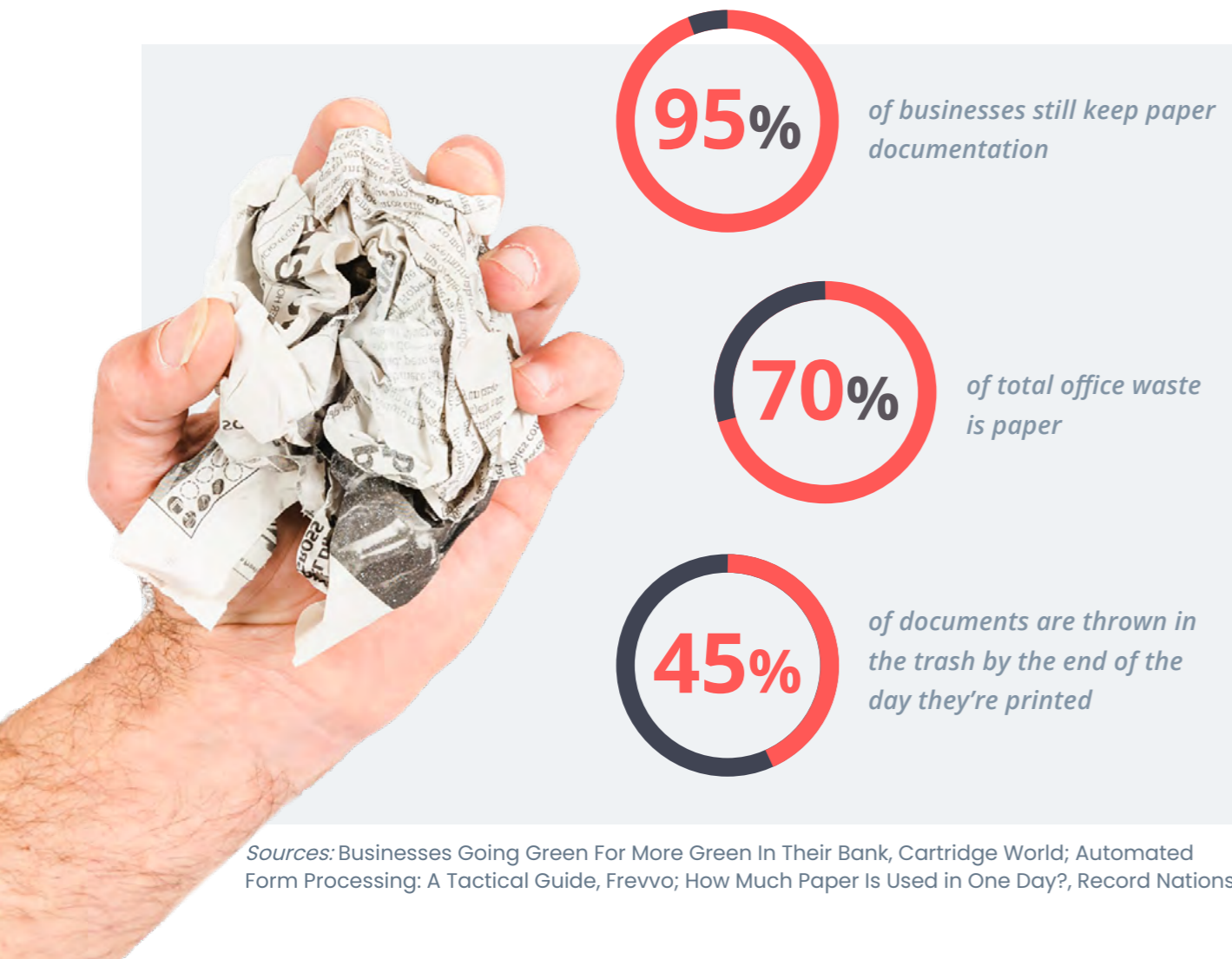


Automating a Greener World

Automation has a plethora of applications that can help to improve resource efficiency and reduce waste to help meet global targets. For instance, AI can be used to monitor and optimize the use of resources like energy and water by automatically adjusting heating or cooling, automating the closure of doors that allow cold or heat to escape, adapting agricultural irrigation to weather conditions in real-time, and much more.

Combined with sensors connected to the Internet of Things, AI can also be used to perform predictive maintenance, prolonging the lifetime of machinery and preventing catastrophic breakdowns. PwC estimates that applying AI to environmental use cases could add some [\\$5.2 trillion](#) to the global economy by 2030.

Automation doesn't have to involve AI. Something as simple as digitizing operations and going paperless can have a significant impact. Automating internal workflows such as approval workflows with digital forms and automatic routing and electronic signature capabilities reduces the need to print, sign, scan, and discard countless pages.



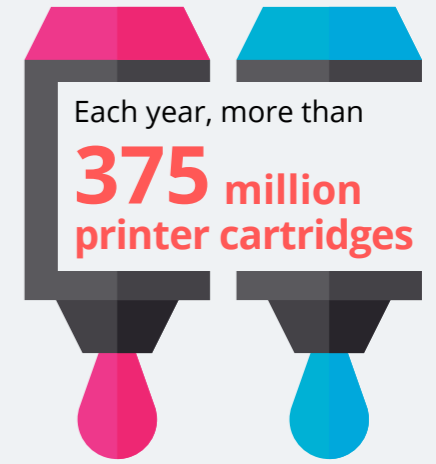
Sources: Businesses Going Green For More Green In Their Bank, Cartridge World; Automated Form Processing: A Tactical Guide, Frevvo; How Much Paper Is Used in One Day?, Record Nations

That's a big deal when you consider that about



worth of paper is discarded in the U.S. alone per year.

Reducing printing output has another advantage



end up in landfills, not to mention the e-waste that comes from old printers themselves.

Sources: Paper Recycling Facts, University of Southern Indiana



Walmart has adopted a number of **digital solutions** like IoT sensors that help to reduce wastage and energy use while improving supply chain transparency and integrity.



Patagonia uses a central AI controller to intelligently monitor and adjust systems ranging from air conditioning and indoor environment to outdoor water use to automatically improve resource efficiency.



In the UK, water company **United Utilities** integrated AI into its systems in 2018. In the first 12 weeks, it reported energy savings of **22%** and is now ramping up AI applications in its operations.



Shell has implemented **predictive maintenance** to identify and repair aging infrastructure to help prevent oil spills.



HydroPoint's cloud-based water management systems leverage IoT technology to manage and improve water usage remotely.



Google uses AI to **manage the cooling systems** in its data centers, resulting in **40%** energy savings. Data centers contribute 2% of global GHG emissions (the same as air travel).

Sustainable Building Practices

Sustainable architecture and building practices seek to mitigate the negative impact buildings have on the environment, both during construction and throughout the life of the building. One aspect of sustainable building practices is designing structures to be more resource-efficient and climate-resilient, for instance by working with the position of the sun to optimize temperature regulation and lighting, selecting eco-friendly construction materials, utilizing resource-efficient lighting and plumbing fixtures, incorporating renewable energy systems into the design, choosing responsible contractors and suppliers, reducing construction waste, and aiming to reduce the environmental impact of the construction process.

There are a plethora of ways to reduce a building's impact throughout the course of its life. For instance, improved insulation lessens heat dissipation, reducing the need for heating. Increased ventilation, on the other hand, can reduce reliance on air conditioning to circulate air. Including renewable energy generation and storage systems can significantly reduce a building's carbon footprint, and adding rainwater harvesting systems and greywater processing can save large amounts of water.

The buildings and construction sector is responsible for nearly

40%

of all energy-related greenhouse gas emissions

according to the UN's 2019 Global Status Report for Buildings and Construction.

The production of construction materials contributes some

11%

of all global greenhouse gas emissions



The high-temperature processes involved in manufacturing these materials (and incinerating or recycling them at their end-of-life) are largely responsible for the bulk of these emissions.

Sources: Low carbon aluminium for construction: building back better, Construction; Heavy industry and the net-zero economy, Energy & Climate Intelligence Unit

Substituting high-emission construction materials with more sustainable building materials such as **recycled materials** (such as building materials reclaimed from demolition sites) and renewable plant materials like fast-growing **bamboo** have significant potential for making buildings more sustainable, compared to using traditional materials. **Phase-change materials** (PCMs) that are capable of storing and gradually releasing heat show huge potential for the green building sector and have been shown to reduce internal temperatures by up to 5° Celsius, which can reduce cooling energy consumption by **30%**

Most green building materials are certified by the Forest Stewardship Council (**FSC**) or Leadership in Energy and Environmental Design (**LEED**). LEED is a green building certification system that offers independent verification that a building was designed and built using methods to improve energy savings, promote water efficiency, reduce CO2 emissions, improve indoor air environmental quality, and practice resource stewardship.

HEIDELBERGCEMENT

HeidelbergCement is the first building and construction company to commit to a goal of carbon-neutral concrete by 2050.

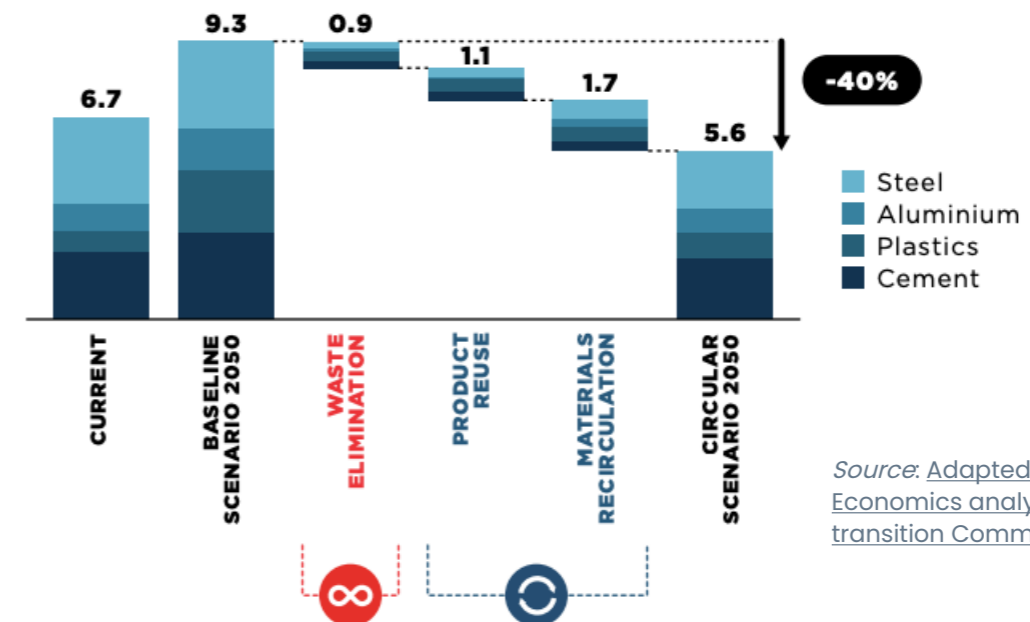


Home improvement multinational Kingfisher has committed to being "forest positive" – planting more trees than its business consumes – by 2025.



Copenhagen-based housing development Upcycle Studios, designed by Lendager Group, was built using recycled concrete, flooring and double glazing.

Global CO₂ emissions from four key materials production
Billion tonnes of CO₂ per year



Source: Adapted from Material Economics analysis for the Energy transition Commission (2018)



SYSTEMS-LEVEL RESPONSE

In order to effect real change and meet our climate change mitigation targets, a systems-level approach is needed. While the efforts of the individual certainly can and do make a difference, it pales in comparison to the impact large corporations, investors, and policymakers can have when sustainability goals inform their decision-making, investments and operations.

Related Trends

Land-Use and Management

Climate action conversations tend to focus on industry, energy, and transport, but [land-use](#) is no less critical a concern, both as a source of emissions and as a means of mitigating climate change. In spite of escalating [deforestation](#), mineral extraction, and other land-use changes, land [removes more emissions than it emits](#). However, land degradation, deforestation, and the destruction of peat-rich wetlands steadily erode this powerful carbon sink.



Agricultural land-use accounts for **45%** of food emissions



70% of global freshwater withdrawals, and half of the world's habitable land is currently used for agriculture.



Deforestation accounts for some **20%** of greenhouse gas emissions



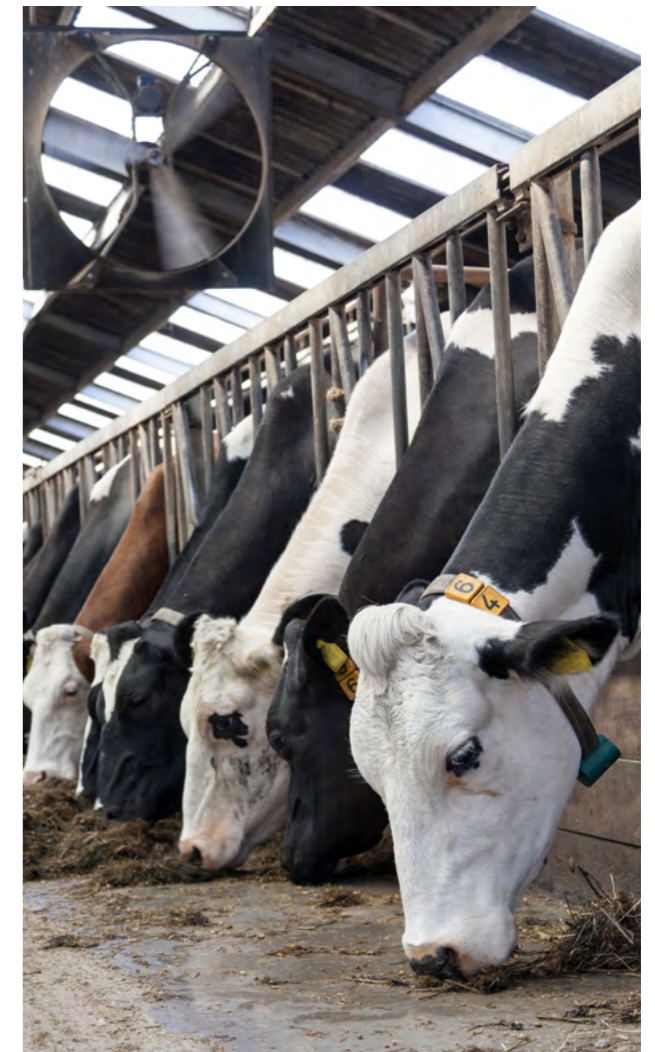
around **70%** of deforestation stems from commercial agriculture.



Sources: Food production is responsible for one-quarter of the world's greenhouse gas emissions, OPur World in Data; Measuring Carbon Emissions from Tropical Deforestation: An Overview, Environmental Defense Fund; FAO: Commercial agriculture accounted for almost 70 percent of deforestation in Latin America, Food and Agricultural Organization of the United Nations

As the human population grows, these numbers will only increase, unless we find solutions that allow for more efficient agriculture. Agricultural expansion causes forests, wetlands, grasslands, and other [carbon sinks](#) to be transformed into farmland, resulting in increased carbon emissions. Land used to raise livestock is responsible for [twice](#) as many emissions as land used for cultivating crops for human consumption.

The destruction of [peatlands](#), which are also massive carbon sinks, releases methane and vast amounts of CO₂ into the atmosphere. Because they're uninhabitable, peatlands are often drained to plant crops like oil palms and pulp and paper plantations. Once drained, peatlands become extremely vulnerable to wildfires that can [burn underground](#) for months or even years, releasing the equivalent of 15% of anthropogenic GHG per year.



Because peatlands sequester 30-70kg of carbon per cubic meter, they're an excellent prospect on the carbon offset market. The [Katingan Project](#) in Borneo is the world's largest [Verified Carbon Standard](#) (VCS) project, covering 157,875 hectares (390,000 acres) of peatland containing a gigatonne of carbon. To protect the peatland, the Katingan Project continuously engages with local farmers to help shift practices away from slash-and-burn farming methods.

Like agriculture, [mineral extraction](#) is responsible for a significant amount of GHG emissions as well as ecosystem degradation. As demand for metal ores used to manufacture technologies like EV batteries increases, so too does the need to find more sustainable means of extracting these finite resources.

It's becoming imperative to improve land use and management through climate-smart agriculture techniques, reforestation, more sustainable mining practices, better forest management to reduce the impact of wildfires, as well as dietary changes and food waste and agricultural waste reduction initiatives.



The **BioCarbon Fund Initiative for Sustainable Forest Landscapes (ISFL)** is a fund aimed at promoting the reduction of GHG emissions in the land sector, in part through initiatives to reduce deforestation and degradation, improve land management, promote climate-smart agriculture, and support eco-friendly land-use planning and policymaking.



The global **Bonn Challenge**, launched by the German government in 2011, aims to restore 150 million hectares of degraded and deforested land by 2020 and 350 million hectares by 2030.



In 2017, **General Mills** made a three-year \$2 million commitment to support the development of digital tools to help farmers, supply chain leaders, and landowners adopt practices that promote soil health and curb overreliance on fertilizers and pesticides



In Australia, livestock farmers are attempting to offset GHG emissions through large-scale tree planting initiatives that will later serve as **timber plantations**.

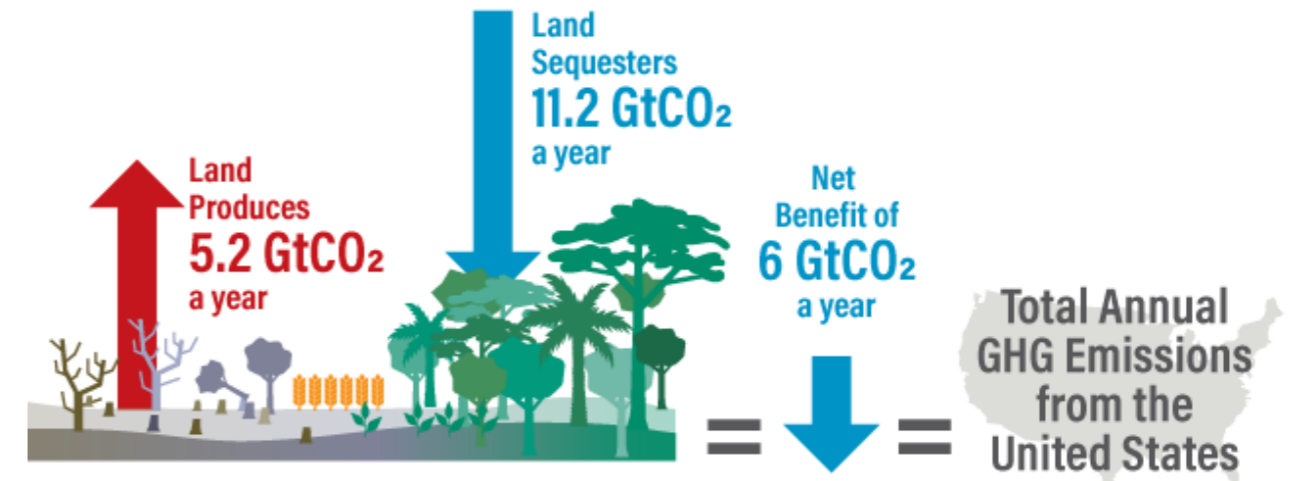


McDonald's is **collaborating** with the WWF to cut deforestation in its supply chain by partnering with its beef, palm oil, and soy suppliers in at-risk areas to find smart agriculture solutions.



Unilever has a **Sustainable Agriculture Code** that mandates that its suppliers work with smallholder farmers to promote soil management strategies that improve carbon sequestration and water retention while increasing agricultural production.

Land is Both a Powerful Sink and Emitter of Carbon Dioxide Emissions



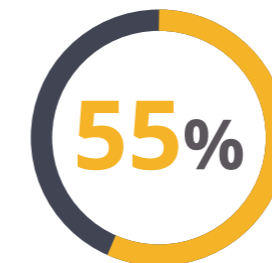
Note: Values are an average over 2007-2016

Source: World Resources Institute (2018)

Circular Solutions

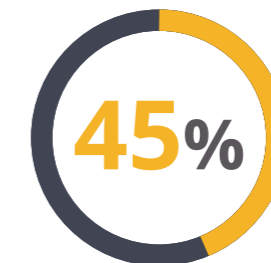
Circular solutions or circular economies take a systems-level approach to sustainability and economic development, aiming to reduce waste and the consumption of finite resources.

While adopting renewable energy sources can address around

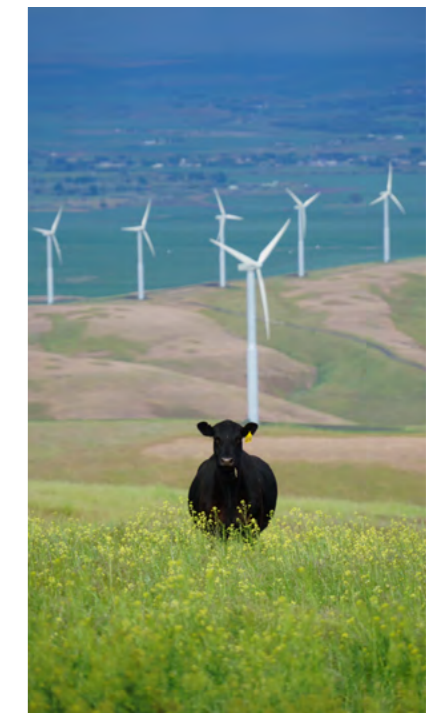


of greenhouse gases

the other



of emissions stem from economic processes ranging from land management to construction, the production of the food, clothing, electronics, and goods we use from day-to-day.



Incorporating circular approaches into the way we design, produce, consume, and reuse goods is essential to reducing emissions and building lasting social, economic, and natural capital.

A growing number of consumer goods companies are implementing circular strategies, partly in response to changing consumer preferences and increased regulatory pressures, such as the European Commission's [Circular Economy Action Plan](#). These changes include designing circular value chains, launching waste reduction schemes, reducing material and energy use, substituting more eco-friendly materials, and transforming business models, for instance by moving to product-as-a-service models.

Sustainable Supply Chains

Transforming supply chains is a complex challenge. From responsible sourcing using small-scale eco-friendly suppliers to localizing operations to shorten the route to market, to enforcing transparency measures – each endeavor to make a business's supply chain more sustainable comes with its own complications.

Perhaps this is why so few large corporations – particularly in the FMCG sector – have succeeded in meeting their targets. For instance, nearly 20 years ago, the biggest chocolate companies in the world [pledged](#) to eradicate child labor in their supply chains. However, according to a recent Fair Labor Association [report](#), none of the signatories have been 100% successful.



Similarly, the Consumer Goods Forum, comprising some [400 companies](#) in some of the commodity supply chains to blame for the vast majority of the world's deforestation – beef, palm oil, soy, paper & pulp – resolved to achieve zero net deforestation by 2020. Today, a mere [21](#) of the signatory companies have reported quantifiable progress.

Progress on greening supply chains has been painfully slow, and the companies that have made progress in this respect tend to be the exception rather than the norm. It has become increasingly clear that high-level systemic change is needed if we're to reach climate targets. Wide-scale collaboration and innovative application of technologies like AI, blockchain, drones, satellite imaging, and the Internet of Things are needed to truly transform supply chains and have a meaningful impact.

Unlocking – and rapidly scaling – the possible applications of these technologies will require cross-industry collaboration ranging from agriculture and food, to mining, to finance, to consumer goods, technology, and more.

The naked truth is that if we don't mitigate climate change, supply chains are at risk of disruptions and losses.

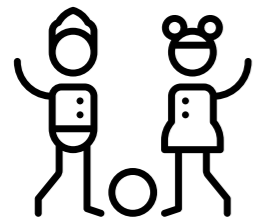


[CDP](#) analysis of data submitted by 215 of the world's 500 largest corporations gave rise to early projections that these companies face potential losses amounting to [\\$1 trillion](#) stemming from climate change. Infrastructure damage and interruptions of supply and distribution arising from [extreme weather](#), water shortages, heat stress, fires, and other climate-related issues can cause billions of dollars of losses.

Meanwhile, companies that proactively invest in building resilience now will be better prepared for the impact of the changing climate and better positioned to mitigate rising costs. Moreover, companies that demonstrate responsible practices through supply chain transparency are likely to win favor among consumers.



43% of CDP Supply Chain program members say they deselect current suppliers based on their environmental track record.



Regulations have been proposed in Europe to help protect child workers from exploitative practices by requiring European cocoa importers to map their cocoa supply chains and disclose human rights violations including forced labor and the use of the labor of underage children. Under recently passed legislation in the Netherlands, executives may face criminal prosecution if repeat incidences of child labor are discovered in their operations.



Shipping companies like Maersk are embracing digital transformation to improve efficiency, allowing customers to book container space through a digital platform.



IBM's Food Trust will help companies like Kroger, Carrefour, and Nestlé to achieve end-to-end visibility and transparency throughout their food product supply chains.



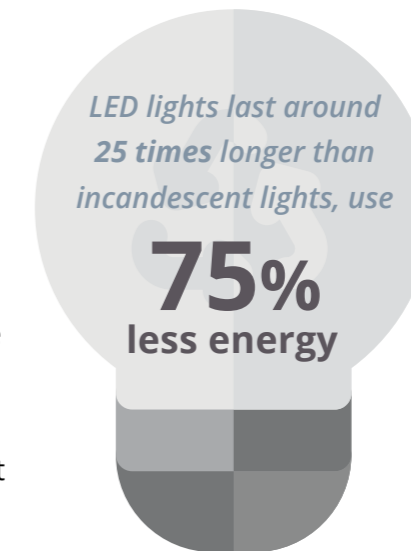
Microsoft has pledged to be carbon negative by 2030, and its plan includes making carbon reduction a key element of its procurement practices.



Spanish global oil company Repsol has set a goal of becoming carbon neutral by 2050, making it the first large oil and gas company to do so.

Resource-Efficient Solutions

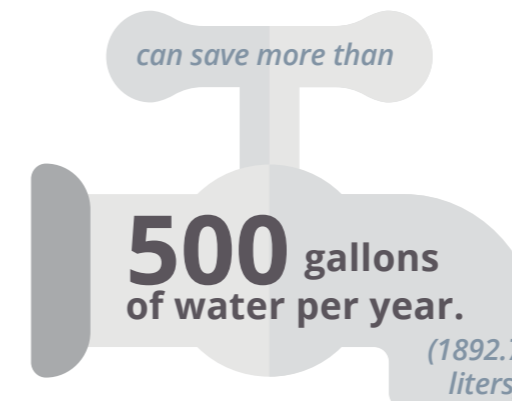
There are a number of steps companies can take to make their operations more resource-efficient and reduce their emissions. For instance, replacing traditional lights with LEDs can bear significant efficiency returns.



They're also more resistant to breakage, generate very little heat, and don't contain harmful ingredients like mercury.

It turns out, clean solar panels = clean energy. Google analyzed the impact of cleaning solar panels after they had been in use for 15 months and found that energy output doubled overnight. Repeating the experiment after eight months boosted electricity production by 36%.

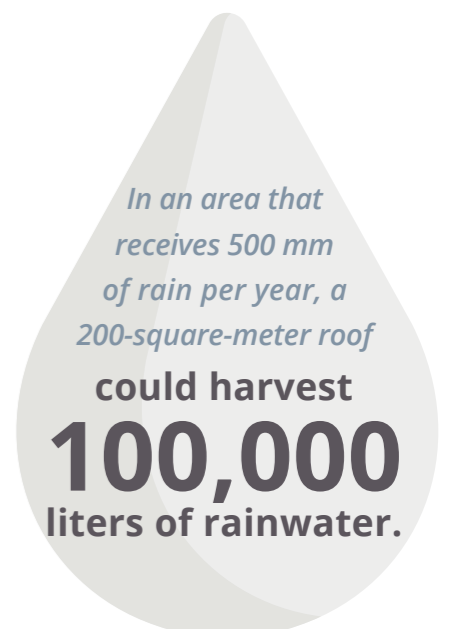
Water efficiency is another important way businesses can make their operations more sustainable. Simple faucet aerators that reduce water flow by 4%

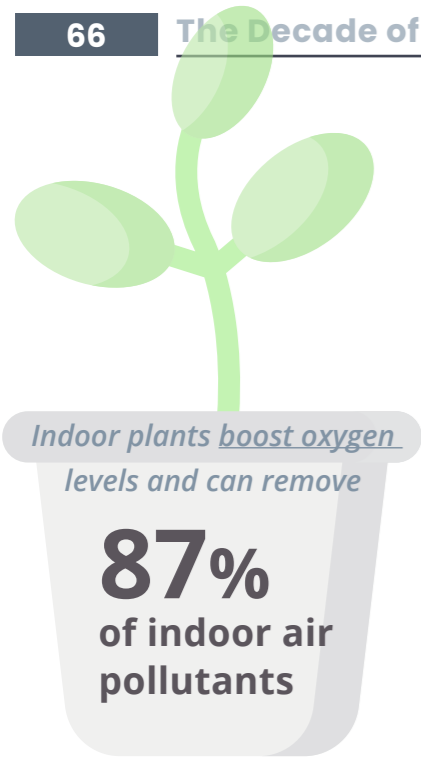


Harvesting and saving rainwater can help businesses and homeowners become more water-efficient, offsetting water utilities, and making gardens and operations more sustainable.

In drier parts of the world, capturing and storing rainwater is becoming increasingly commonplace even among urban homeowners. The drought that nearly saw the city of Cape Town run out of water caused rainwater storage tank sales to soar.

Considering factors like temperature control when designing plants not only improves resource efficiency with regards to atmosphere control but can prevent heat from causing equipment failures and prolong the operating life of electronics.





including formaldehyde and carbon dioxide – within 24 hours, according to NASA research.

Holding meetings, conferences, exhibitions, and training virtually is another way for businesses to significantly reduce their carbon emissions by reducing the amount of air travel and transport involved.

Blue Pillar uses IoT technology to provide companies with energy management services, giving businesses greater insight into their energy usage to improve efficiency.



Coca-Cola has set a global water goal to replenish the water used in its products and production and return it to the local communities in which it operates. In pursuit of this goal, the company has rolled out wastewater treatment facilities within nearly all of its plants.



Walmart made a simple change of turning off the lights in its employee vending machines, reportedly saving **\$1 million** per year in energy costs.



Apple has built a number of **solar and wind farms** to improve the sustainability of its operations.



The circular economy represents a multi-trillion dollar economic opportunity.

In spite of this, it's estimated that only



of global operations are currently circular, which means there is much to be done in terms of designing waste out of the system and ultimately redefining growth.

Circular solutions in sectors such as mobility and construction have the potential to reduce CO2 emissions from **steel, cement, plastic, and aluminum** by



or some 3.7 billion tonnes by 2050, which would account for nearly half of their zero emissions target.

These four materials are responsible for



of industry's global CO2 emissions which in turn account for 21% of overall global emissions.

The circular economy is inextricably linked to carbon-reduction initiatives and plays an integral role in reducing habitat and biodiversity loss, resource scarcity, and pollution. By adopting a systems-thinking approach to sustainability, businesses can build climate resilience considerations into every stage of their value chain.

Applying Circular Economy Principles



Design out waste and pollution to reduce GHG emissions across the value chain

Keep products and materials in use to retain the embodied energy in products and materials

Regenerate natural systems to sequester carbon in soil and products

Source: Ellen MacArthur Foundation (2019)



Starbucks recently announced a goal to become a “resource-positive” company, eliminating waste, storing more carbon than it emits, and using less fresh water than it provides.



In the automotive industry, a strategic partnership between Audi and materials company Umicore recently completed a successful *pilot* recovering more than 90% of the cobalt and nickel from high-voltage Audi e-tron batteries.



Department store chain John Lewis has started offering *furniture rentals* in an attempt to offer customers more sustainable options through the sharing economy. Products are cleaned – and refurbished if necessary – between rentals.



A new *partnership* between McDonald's and Ford will create car parts from coffee bean waste.



In addition to famously *reusing old rocket parts*, SpaceX is developing a fully reusable rocket called *Starship*.



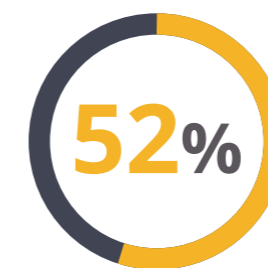
Adidas, which has also launched shoes made from ocean waste and 3D-printed soles, has designed the first performance running shoe that fits within a circular life cycle. 100% of the *Futurecraft Loop* shoe can be recycled, thereby providing material for the production of new shoes.

Investing in Human Capital

The Social and Human Capital Coalition (SHCC), which forms part of the *Capitals Coalition* has published a framework called the *SHCC Protocol*, which aims to set the standard for measuring the value and impact of human capital. This protocol gives companies the tools to evaluate the way they manage internal human capital and how this impacts the employees and the business, as well as investigate the effect their value chain has on communities and broader society.

Using this framework, Nestlé *studied* the relationship between wage compensation and employee wellbeing relative to regional living expenses. It found a distinct correlation between employees being paid a living wage (as opposed to the legally-mandated minimum wage) and improved health and general quality of life.

Intangible assets like human capital and company culture comprise an estimated



of the average company's market value.

Meanwhile, unaddressed depression and anxiety are the cause of an estimated **\$1 trillion** in productivity losses globally, according to the World Health Organization.



Awareness of the business impact of human capital is growing, causing investors to take a greater interest in this topic.

In turn, it can be expected that more and more companies will accept employee wellness as integral to their operational efficiency and adopt new, holistic approaches to promoting employees' mental and physical wellbeing.



Having fostered a culture of inclusivity and employee engagement, IBM shared a [Work from Home Pledge](#) that evolved from a grassroots initiative to a company-wide commitment to provide meaningful support to one another, stay socially connected, and prioritize work-life balance and mental wellbeing – as well as to respect those “not camera ready” times.



Johnson & Johnson’s [Employee Assistance Program](#) aims to promote employee wellbeing by providing mental health resources through a combination of internal social support and clinical treatment. In addition to improving overall emotional wellbeing, this intervention has shown improvements to productivity, reduced absenteeism, and reduced costs associated with healthcare.

JPMORGAN CHASE & CO.

After analyzing internal health data, JPMorgan Chase launched a holistic [mental health support](#) initiative that includes training managers to recognize mental health disorders like depression and anxiety and respond with sensitivity and empathy, referring employees to its employee assistance program for early intervention and support.



Researchers at Australia’s Deakin University have created a [smart cube that monitors workers’ wellbeing](#). Cube Comfort Monitors contain sensors that measure conditions in the workplace like light intensity, air quality, and sound levels. The data is then transmitted to a cloud-based server in real time, which office managers can access to address problematic concerns.

Sustainable Finance & ESG Investing

Investor behavior has undergone a sea change in recent years where ethical investing is concerned. Once associated with average or poor investment performance and limited to specific niches, responsible investment is now rapidly becoming par for the course. With some [\\$40.5 trillion](#) in assets under management (AUM) currently sustainably invested globally, the trend of putting one’s money where one’s morals are is likely to continue to gain traction as millennial investors come into their own.

Referring to environmental, social, and governance (ESG) criteria in investing, the term ESG was popularized by a 2005 conference report titled [Who Cares Wins](#) authored by Ivo Knoepfel and produced by the [International Finance Corporation](#) (IFC) following a 2004 conference held under the auspices of the [UN Global Compact](#), the IFC, and the Government of Switzerland. The late Kofi Annan, who was UN Secretary-General at the time, invited the CEOs of more than 50 key financial institutions to participate in the discussions, with the aim of integrating ESG goals into mainstream capital markets. The report made the case that embedding ESG considerations into capital markets not only leads to more sustainable markets and better societal outcomes but also makes sound business sense from a financial perspective.



In the same year (2005), the [UN Environment Programme Finance Initiative](#) (UNEP/FI) published a legal framework for the integration of environmental, social, and governance issues into institutional investment, better known as the [Freshfields Report](#) due to the law firm [Freshfields Bruckhaus Deringer](#)’s involvement in producing it. The report aimed to investigate whether the fiduciary duties of a portfolio manager were legally limited to pursuing profit maximization, as was widely held at the time, or if acting in their clients’ interests could (and should) encompass other objectives, such as protecting the environment or contributing to improved societal conditions.

Freshfields’ report found that in all the jurisdictions studied, institutional decision-makers have the latitude to apply a broad range of diversified investment strategies, provided that their investment decisions are “rational and economically defensible.” As such, there is no

reason ESG factors should not be taken under review as part of the process of assessing an investment's expected impact on a client's portfolio. More to the point, all of the potential effects of ESG considerations on the investment strategy should be analyzed, including factors such as the general socio-political and economic context, projected tax consequences, projected risk and returns, and the role of each investment within the larger portfolio.

The two reports mentioned above became the basis of the [Principles for Responsible Investment](#) (PRI) unveiled at the New York Stock Exchange in April 2006, followed by the introduction of the [Sustainable Stock Exchange Initiative](#) (SSEI) in 2007. The UN-backed PRI is now a flourishing global operation with more than [2,300](#) corporate signatories in 135 countries and more than [\\$97 trillion AUM](#) in 2020, making it the world's largest voluntary sustainability initiative. Signatories commit to six voluntary principles, the first of which is the incorporation of ESG issues into investment analysis and decision-making. The PRI aims to support ESG criteria integration into finance and risk analysis by creating tools and offering guidance and engagement.



PRINCIPLES FOR RESPONSIBLE INVESTING

- We will incorporate ESG issues into investment analysis and decision-making processes
- We will be active owners and incorporate ESG issues into our ownership policies and practices
- We will seek appropriate disclosure on ESG issues by the entities in which we invest
- We will promote acceptance and implementation of the principles within the investment industry
- We will work together to enhance our effectiveness in implementing the principles
- We will each report on our activities and progress towards implementing the principles

ESG is hardly a new concept but rather a permutation of earlier responsible or ethical investment concepts. In the [1960s](#), the socially responsible investing (SRI) movement began to gain traction, with investors applying negative screening and avoiding certain stocks or whole industries based on moral and ethical considerations. These include not investing in businesses with negative environmental ratings and poor track records regarding human rights or the treatment of employees and/or firms that work with products such as tobacco, alcohol, and firearms or those that are involved in gambling practices. However, whereas ethical investing processes formerly avoided certain markets altogether, ESG investing creates an opportunity to collaborate with businesses to foster better practices that offset the negative impact of their industries.



Corporate social responsibility and corporate social investment initiatives, which paved the way for ESG, represent corporations' efforts to effect positive change for their employees, consumers, the environment, and community at large.

A broad range of considerations that did not previously factor into the financial analysis are now being taken into account not out of philanthropy but because they have financial relevance. These issues include corporations' environmental sustainability initiatives such as [emissions offsets](#) and water management, social responsibility endeavors such as how they treat their employees and health and safety compliance, and corporate governance, supply chain management, privacy and data security, company culture, and approach to innovation.

While the term is often used interchangeably with ESG, [impact investing](#) differs from ESG in that it targets investments that seek to solve specific social or environmental issues. Impact investing is thus a subset of the broader responsible investing movement. According to a recent report by the [Global Impact Investing Network](#) (GIIN), the current size of the global impact investing market is [\\$502 billion](#).

These initiatives, while admirable, are typically self-regulated. ESG criteria, however, require [metrics](#), which means that businesses that wish to be rated as ESG-compliant must be able to quantify their efforts, demonstrating, for example, how many tonnes of carbon emissions, gallons of water, or kilowatts of electricity they save year on year.

With growing global awareness of the real-world implications of climate change, people are beginning to see it as a real threat and becoming more motivated to promote sustainability, including by supporting companies that do the same.

Demographic shifts and increased dialogue around issues such as human rights, social justice, diversity, and inclusion are changing the way people relate to one another – and to brands.



Simultaneously, increased regulatory pressures, coupled with fierce competition for talent in key industries, are placing enormous pressure on corporations to implement good corporate governance. Simply put, the world is changing, and business is changing with it.

Investors are changing too. More than ever before, consumers are taking companies to task for unsustainable, unethical, or unconsidered practices, often in successful, widely publicized campaigns. With constant exposure to such stories – or participation in such activities – it's hardly surprising that investors are beginning to apply the same principles to their financial decisions as to their consumerism.

At the same time, advances in data gathering and analytics capabilities are allowing for larger quantities of higher quality data. As a consequence, we are seeing new and more effective means of quantifying and qualifying ESG performance and correlating these criteria to financial performance. As more research comes to light, the case for ESG investing becomes more robust.

ESG initially met with significant resistance due to the widespread belief among investors that their fiduciary duty ended at maximizing profit, regardless of ESG issues. However, as more evidence has emerged demonstrating that ESG factors have far-reaching financial repercussions, this stance has declined.

ESG activity is now regarded as essential to understanding corporate purpose, strategy, and management quality. ESG criteria have the practical application of signaling risk. When companies' practices do not align with ESG goals, it can be a clear signal of mismanagement, a dearth of innovation and insight into the zeitgeist, or even blatant disregard for government regulations, which may lead to significant future losses. Academics have published work showing the key role that ESG information can play in [analyzing corporate risk and performance](#), while Morgan Stanley Capital International (MSCI) researchers found that higher ESG ratings are associated with [higher profitability, lower tail risk](#), and lower systemic risk than low ESG-rated companies.

Institutional investors are increasingly establishing ESG mutual funds and exchange-traded funds to appeal to younger investors in particular, as they prefer investing in corporations with strong ESG credentials.

We're likely to see an intergenerational wealth transfer of some **\$30 trillion** from baby boomers to millennials over the next 30 to 40 years.



Given that millennials are far more likely to rank ethical investing as "fairly important" or "important" than baby boomers (according to investment platform [AJ Bell](#)), this transfer is expected to have a significant impact on the landscape of responsible investing.

As yet, there is no standard metric for ESG analysis; however, a growing number of third-party companies including Bloomberg, Morningstar, MSCI, Fitch, and Thomson International are providing ESG ratings, which has given rise to a budding industry of ESG specialists and consultants. In a testament to the recent surge of interest in responsible investing, the [Chartered Financial Analyst Society of the UK](#) has launched an [ESG analysis qualification](#).

THE NEW CLIMATE ECONOMY

USISIF

The Forum for Sustainable and Responsible Investment

Vanguard

BlackRock

CREDIT SUISSE

LOMBARD ODIER
LOMBARD ODIER DARIER HENTSCH



The Global Commission on the Economy and Climate estimates that **\$90 trillion** in investment over the next 15 years is needed to meet climate and sustainable development targets.

\$380 billion is the current average annual value of the sustainable finance market.

In 2018, carbon and climate change were the top ESG concerns for financial managers representing \$3 trillion in AUM, and the third biggest concern for institutional investors representing a collective \$2.24 trillion, according to the [US SIF Foundation](#).

ESG is currently top of mind for senior executives at 43 of the top institutional investment firms including BlackRock, State Street, and Vanguard, according to a recent [study](#) conducted by the Harvard Business Review. This is important given the fact that BlackRock and Vanguard control the **biggest blocks** of shares in almost every publicly-traded company in the US. In recent years, they've faced criticism over their failure to support crucial climate proposals when put to a vote. However, BlackRock recently announced that it won't invest in companies whose revenue from thermal coal account for more than 25% of their earnings.

Credit Suisse has [partnered](#) with Lombard Odier to create a fund to invest in businesses that focus on driving sustainable production and consumption models, in alignment with SDG 12.

In October 2019, the green bond market passed the **\$200 billion** total issuance milestone.

Nigeria has issued the country's first certified [African Climate Bond](#). 80% of the proceeds will go toward flood defenses to mitigate rising sea levels and protect coastal communities.

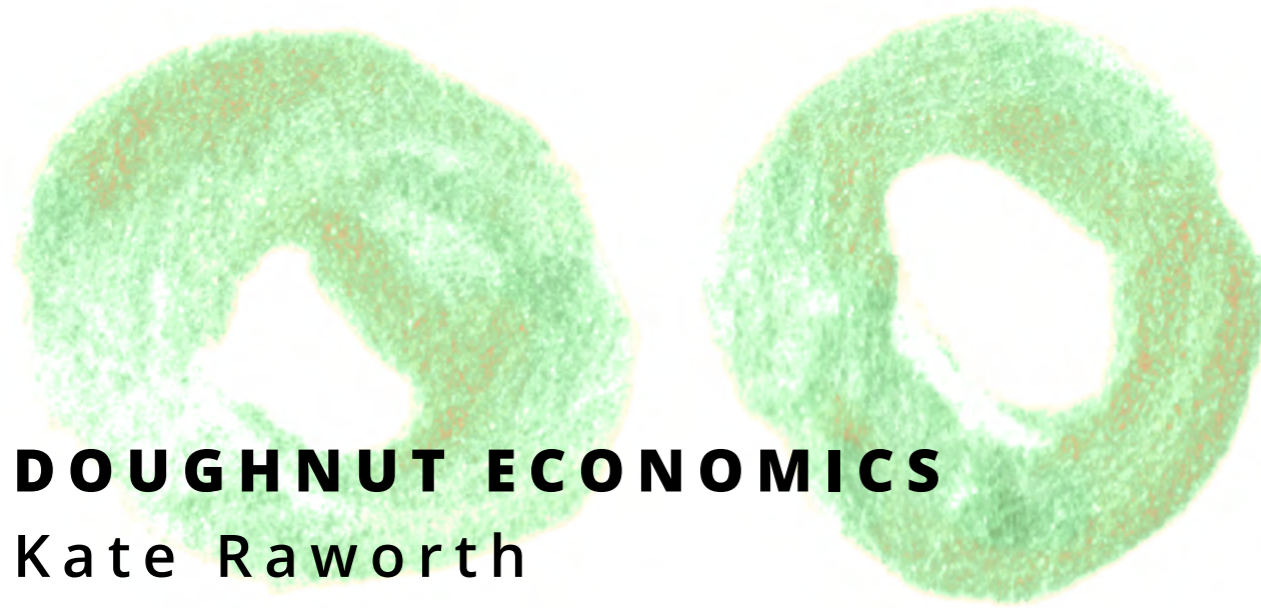


A SNAPSHOT OF THE FUTURE

Taking the Green Road

This scenario explores what the world looks like if we collectively “take the green road” and actively pursue the targets outlined in the UN 2030 Agenda for Sustainable Development in a post-pandemic landscape.

Discover the **trends, technologies and risks** mentioned in this section with **free access to the [ITONICS Sustainability Radar](#)**. We invite you to explore and identify those most relevant to your organization, and uncover opportunities for sustainable innovation. [»»](#)

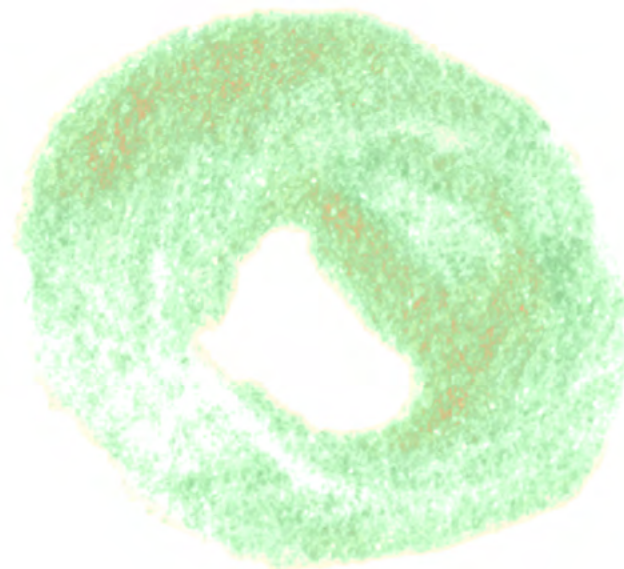


DOUGHNUT ECONOMICS

Kate Raworth



A future that espouses Taking the Green Road requires us to reconsider current structures, redesign the economic model and establish a new narrative. Famed economist Kate Raworth suggests that the new generation of economists look to a revised framework for economics, recognizing the various feedback loops that influence economic stability. The premise of Raworth's work considers how we might picture the economy as a doughnut, where sustainability remains between two boundaries: our social foundation of human needs and the environmental ceiling of the earth's ecological limits. Envisioning what prosperity might look like, Raworth recognizes the flaws of neoclassical equilibrium thinking, abandons old academic assumptions and poses a new script for the system to be restructured:



The world transitions gradually, but pervasively, toward a more sustainable path. True global coordination and cooperation leverage the \$10 trillion post-pandemic stimulus to align economic and environmental priorities. **Responding to scarcity**, all actors – civil society, governments, companies, and individuals – take decisive action for the development of an integrated low-carbon response that respects environmental boundaries.



Dislocated and desynchronized as a result of widespread lockdown restrictions, society adjusts to a new normal. Reliable, scheduled community moments have disappeared and left individuals on variable and scattered time-space paths.

Loss of daily interactions and lack of consistent human interaction leaves communities fractured, exacerbating loneliness.

This contrast shifts society to a connected decade enabled by advancing technologies like 5G, Edge Computing, and Augmented Interactive Reality. Society draws closer by reconciling distance and difference, embracing shared experiences in support of collective progress.

In the context of uncertainty, economic instability, and misrepresentation, there is a disillusionment with formal institutions and skepticism of old ways of thinking. With a new awareness, communities reform to address the social and economic disparities we had previously come to accept. Around the world, resilient countermovements gain steam, unabated by COVID-19 as activists continue to strive for total **systemic revolution**. Amid the shift from top-down corporate dominance to post-ownership models, individuals and groups take a stand on social issues in their capacity as private citizens – some from the comfort of their homes while many protest in the streets. Generation Z continues to lead the charge.



Continued questioning of **identity politics** demands intersectional representation that is inclusive of all people regardless of gender, sexuality, race, or economic status. Challenging societal structures like finance, education, and policing, disillusioned citizens actively oppose political delays and demand **radical transparency**, restructured **global governance**, and informed state-owned recovery programs. New demand for action invites governments to join the **war for talent** – attracting and retaining top talent to build the capabilities needed to assess economic policies and think beyond the coronavirus crisis to accelerate the transformation.

While **global trade protectionism** and economic nationalism prioritize immediate domestic interests over foreign trade to boost domestic production, competitive international trade is crippled. Greater inflationary pressures call for existing

subsidy regimes to be reconsidered. Significant portions of the resources deployed for economic recovery are devoted to climate-change mitigation and resilience.

Enhanced historical models facilitate climate stress-testing in funding programs while blended finance models support a broad range of sustainability initiatives to deliver returns that create jobs, drive capital formation, and foster economic resiliency. There is greater investment in building renewable-energy infrastructure, expanding the capacity of the power grid, retrofitting buildings to be more resource-efficient.

The cost implications of carbon tax and global emission trading incentivize the development and deployment of advanced technologies to decarbonize heavy industries.





The transition to **democracy 2.0** is accelerated by investments that prioritize education and health. The definition of economic success shifts toward a broader emphasis on human wellbeing. Good business is good business, so **impact investments** – designed to deliver measurable societal benefits together with financial returns – have gone mainstream. Reinforced national and international alignment of sustainability taxonomies focuses efforts. Global alignment and commitment to achieving development goals reduce inequality both among and within countries.

Management of the **global commons** – the resources we all share as a planet – slowly improves and **global access to Internet** invites greater open-source participation, collaboration, and co-creation. **AI aspirations**, coupled with **haptic feedback** and the **Internet of Things**, augment intelligent infrastructure planning, **smart public services**, and **cities**. Emerging mobility technologies offer environmentally-conscious options to get around. Energy storage has developed to support electromobility and other electrical ecosystems, offering batteries-as-a-service and accelerated charging options. Hyper-connected urban spaces improve the functionality of every square inch, enhancing quality of life.



Changing attitudes within a resource-scarce world have impacted what consumers choose to 'vote' for with their wallets, supporting local, ethically-produced, plastic-free, fair trade, and cruelty-free products.

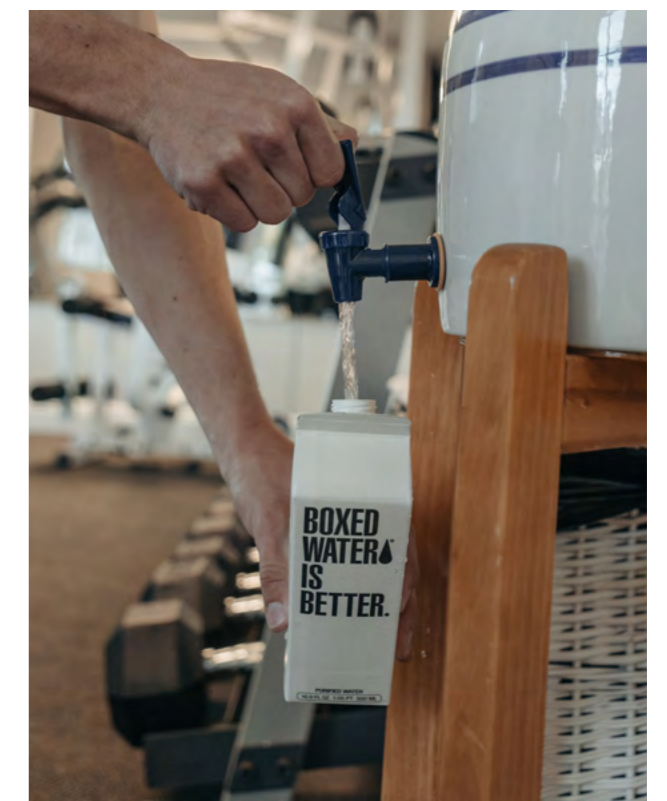
There is a growing movement of environmentally-conscious consumers who desire a more minimalist lifestyle and reject excessive consumption culture. These individuals aim to have as little impact as possible on the planet and try to align their behavior to this goal.

Pressured by the ongoing impact of the crisis, companies continue to experiment out of necessity and adopt successful measures. Businesses align immediate pandemic responses with the imperative of sustainability. Cost-efficiency exercises and digital transformation efforts evolve business models and drive differentiation. Proactive leadership teams emphasize the importance of meaningful **employee value propositions** to entice the next-generation

workforce and meet the growing demand for multi-disciplinary skill sets within the context of a hyper-competitive recruitment landscape. The **flexible workplace** is now ubiquitous. As brands prioritize **purposeful practices**, they grow their sustainability focus beyond compliance to deliver shared value and **triple-bottom-line** growth.

Organizations embrace **distributed manufacturing** to engage with local markets more closely, create stable solutions with shortened supply chains, and offer the efficiencies required for **on-demand delivery**. Economically marginal, carbon-intensive assets are retired to develop green supply chains. Enterprise Supply chain Development (ESD) is leveraged to strategically optimize systems for shorter-term performance and simultaneously ensure longer-term resiliency. By joining forces, brands and manufacturers produce eco-friendly alternatives with new materials, without sacrificing aesthetics or ease of use.

Corporates change their mindsets from 'value chain' to 'value cycle' – building a circular economy around their products and strengthening environmental ecosystems across markets. Consumers are included in the cycle with mechanisms to feed post-consumer materials back into production and manufacturing. **Behavior shaping** is adopted by brands to drive loyalty and incentivize consumers to participate, helping to close the loop and promote low-material growth and reduce resource and energy intensity.





LESS

Diets shift to meet ethical life choices, and with numerous options readily available, niche preferences are no longer limiting. **Community-level Stewardship** – when combined with Future Farming technologies and methods such as regenerative agriculture, vertical and urban farming, genetic modification, automation, and precision farming – create efficient, traceable ecosystems; maximize space; and generate nutrient-dense, better-for-the-planet food solutions.

As “mainstream environmentalists,” consumers take climate-positive steps to change their consumption habits and dependencies. Frustrated by the leisurely pace of change, they come to challenge corporates and social institutions

by taking transformation into their own hands. The rising demand for **ethical fashion brands** and **sustainable travel and tourism** drives entrepreneurship as new businesses emerge to address this need.

Consumers adopt sustainable solutions with fervor to ensure long-term, shared prosperity. Desiring a radical shift toward decentralized systems, individuals only continue to support those brands that seed conscious capitalism.

Empowered consumers become brand advocates and engage with businesses based on values rather than value. Only brands brave enough to hold true to a purpose beyond commercial success prevail.

IMPLICATIONS FOR INNOVATION

Local Express

Q

B

Looking to the future, a wide range of new “pathways” demonstrate that the array of economic, business, and social risks associated with the impending climate crisis can no longer be denied. A continued disconnect from the reality of the change presented by the next century is not only an urgent social priority but a wasted opportunity. We believe that renewed strategic priorities present a new frontier for differentiation. To fuse sustainability and a sustainable competitive advantage coherently, business leaders must consider the following Implications for Innovation:

CONFRONTING CLIMATE RISK GOES BEYOND COMPLIANCE

Over the last few decades, corporate agendas have prioritized shareholder returns with greater reliance on financial strategies, M&A, and relentless process optimization for efficiencies. Though such priorities create value in the near term, they often forego the opportunity to build a long-term sustainable advantage. This is further exacerbated by the fact that issues of sustainability and societal challenges are often treated as separate from core business operations.

Greater momentum in stakeholder capitalism, disclosure of progress on environmental, social, and governance (ESG) reporting and climate responses have helped to define metrics for benchmarking sustainability and given rise to increasingly relevant and high-quality data. This, in turn, supports the case for ESG reporting. Unfortunately, this has inadvertently created an overemphasis on compliance, often decoupling ESG efforts from strategy, innovation, and competitive advantage.

Current reporting standards rarely include the full business ecosystem, the industry, or the broader network of stakeholders – all of which play a role in constraining or enabling the strategic potential of sustainability initiatives.

In the future, leading organizations transition from disjointed corporate social responsibility (CSR) initiatives to integrated sustainability-focused innovation.

While corporations have been seen to make minor changes in core business models or value drivers through CSR, this does little for either competitiveness or societal benefits at scale. Mature integration includes driving compliance through incremental business process improvements and reactive response to meet market and stakeholder pressures. For impact at scale, sustainability must be integral to business model innovation to create holistic ecosystems that co-optimize for business and societal benefits.

SUSTAINABILITY ISSUES ARE INHERENTLY SYSTEMIC

Sustainability is an emergent property of our greater social dynamic. It has long been evident that the climate crisis is largely a crisis of how society produces and consumes energy. Yet, responses have remained largely technical. These approaches are reductionist, fragmented, and mechanistic. In contrast, sustainability solutions are inherently systemic and present a complex adaptive challenge.

In complex contexts, conventional deterministic models are of limited use. Similarly, incremental improvements in reactive technical solutions are not going to unlock change at the necessary pace and scale. There is a gap between the nature of current models that decision-makers use and the context in which these models are applied. As a result, it is essential to understand and be cautious of implicit biases and outdated mental models; methods of the past are no longer a reliable blueprint for the future.

Changes in mindset, operating models, processes, and tools will be needed to integrate systems-thinking into decision making.

A holistic approach is required to understand the complexities of climate risk and identify the full range of direct and indirect impacts that interventions may have. Innovators must adapt to understand and meet the realities of the inherent interrelatedness of the systems in which they work.

Anchored in appropriate methodologies, structures, capabilities, and decision-making frameworks, this renewed approach deploys capital and resources with a broader intent and context. By moving away from an incremental, siloed project-by-project mentality, teams transition to an integrated strategic paradigm where a new social fabric can be woven – not only from technological advances but also from cultural, political, social, and economic innovation.

“

The point here is not that emissions don't matter. It is a call for a shift in priorities. On the policy level, we need to shift toward protecting and healing ecosystems on every level, especially the local. On a cultural level, we need to reintegrate human life with the rest of life, and bring ecological principles to bear on social healing. On the level of strategy and thought, we need to shift the narrative toward life, love, place, and participation. Even if we abandoned the emissions narrative, if we do these things, emissions will surely fall as well.

”

Charles Eisenstein / *Climate: A New Story*



NEXT-PRACTICE PLATFORMS WILL PAVE THE WAY FORWARD

Innovation efforts must evolve to stimulate systems transformation in the places that matter for human prosperity. For true sustainability, more needs to change than the methods and technologies used to extract, convert, and allocate resources within our economy. To produce deep, structural changes within the system, paradigms must shift – on both the individual and collective levels – to create a more equitable balance of political, cultural, and institutional power in society.

Paradigms represent the culture of a community as the deepest and most commonly accepted beliefs and shared ideas in the minds of its members. As the foundations of a system – defining its goals, information flows, feedback loops, material stocks, and flows – paradigms have the greatest influence on a system’s behavior and are thus a powerful place for intervention.



*“Next-practices”
are those that
evolve existing
paradigms;
introducing better
ways to synthesize
and network
capabilities to
produce shared
value.*



[Next-practice platforms](#) rely on moving beyond benchmarked capabilities (i.e. beyond best practices) thereby enabling new ways to create value. Converged value propositions and ventures into seemingly-unrelated revenue streams enable organizations to serve people’s needs more holistically. Multisector coalitions advance shared-value efforts and derive new competitive advantages. To successfully design and develop innovations that lead to such next-practices, executives must look outside their domain to explore alternate possibilities at the fringes of what they know.

The imperative of next-practice platforms builds on questioning the implicit assumptions behind current practices. This provides an understanding of where issues of sustainability, risk, and stakeholder interests intersect with business imperatives and potential value drivers. To gain this perspective, leadership must expand the business context, foster a culture of curiosity for ongoing network-enabled R&D, and incorporate early involvement of stakeholders. Conducting a sustainability assessment of the planned innovation will help to embed feedback loops into technology development.

Recommendations

The question is no longer why the sustainability agenda holds strategic relevance or what action must be taken in order to achieve it, but rather how to do so.

1

Benchmark current capabilities and initiatives with emerging compliance & regulations

2

Understand physical climate risks across geographies and industries

3

Align strategic goals to coincide with international imperatives

4

Reevaluate and optimize the value chain and full lifecycle

5

Embed good stewardship into product and service design

6

Monitor and manage new measures of performance



1

BENCHMARK CURRENT CAPABILITIES AND INITIATIVES WITH EMERGING COMPLIANCE & REGULATIONS

Adhering to the lowest environmental standards may fulfill short-term business objectives. However, complying with regulations prior to their enforcement may set organizations several design cycles ahead of others and produce a first-mover advantage.



Before jumping on potential solutions, executives should look beyond the measurement of product and material flows to reveal the extent to which the organization has already integrated sustainability into company systems and operations, from idea generation through R&D to commercialization.

Suitable indicators such as the [Material Circularity Indicator](#) developed by the [Ellen MacArthur Foundation](#) measure how well a product or company performs in the context of set sustainability objectives, thereby allowing companies to estimate and track how advanced they are on their journey.

These indicators provide a view on existing strengths that can be underscored as differentiators and allow additional impacts and risks to be taken into account. Audits of this nature support decision-making on tradeoffs, improve R&D design briefs, and enable internal reporting. These audits also facilitate rating companies for the sake of Preferential Procurement (PP) and Enterprise and Supply chain Development (ESD).

2

UNDERSTAND PHYSICAL CLIMATE RISKS ACROSS GEOGRAPHIES AND INDUSTRIES



In order for companies to develop a long-term perspective, they will need to understand the evolution of risk as well as the associated adaptation costs and integrate the local voices of affected communities and industry leaders into their decision making.

The extensive damage that climate risk can inflict is already evident in past events that have resulted in significant disruption and negative socio-economic impacts. Heatwaves, drought, hurricanes, fires, flooding, and depletion of food supplies threaten certain geographies and industries.

For companies to mitigate these physical risks, executives must take climate considerations into account when reviewing location, capital allocation, raw materials sourcing, and supply-chain management. Investments, innovation initiatives, and operational projects must therefore be evaluated in a way that indicates the probability of climate hazards and potential losses of exposed assets.

Beyond black-and-white decision making, many stakeholders will have to find means to proactively adapt. Key innovation areas involve developing tactics to adequately protect people and assets, build resilience, reduce exposure, and ensure that appropriate emergency budgets and securities are in place.

3

ALIGN STRATEGIC GOALS TO COINCIDE WITH INTERNATIONAL IMPERATIVES

The sustainability agenda requires working collaboratively with all stakeholders – from suppliers and customers to employees, shareholders, and governments – to achieve the ambitious targets assessed and agreed upon by the scientific community and international governing bodies.



Presently, the [Paris Agreement](#) represents our best strategy to draw down carbon emissions and control the impacts of global warming. By these terms, if we, as global citizens, hope to stay within the carbon budget, we need a net reduction of emissions of at least 1 billion tonnes (a gigatonne) per year for the next 30 to 50 years. Not only does this level of emission abatement require aligned collective effort but a unified, regulated classification system for what economic activities are termed to be “green” and “sustainable.”

Tools such as the UN SDGs and investment taxonomies currently being developed, effectively guide organizations and are indispensable in making climate targets implementable in practice. While many national and regional taxonomies are still in development, the EU technical experts group on sustainable finance (TEG) has recently published its [report on EU taxonomy](#) – the world’s first-ever “green list”.

The development process of such tools requires that organizations weigh in with feedback to enrich the functionality and to ensure that their economic interests are taken into account throughout the iterative process. Once established, executives must align strategic goals to coincide with international imperatives using the [tools](#) provided to implement them in their own activities.

4

REEVALUATE AND OPTIMIZE THE VALUE CHAIN AND FULL LIFECYCLE

Many firms are now accustomed to collaborating with suppliers and partner networks in clarifying their vision and objectives. However, the sustainability agenda requires that executives broaden and deepen those links to extend to the entire value chain, taking ownership of impact even post-consumption.



Sustainability leadership must observe an expanded and augmented business landscape. To gain this new perspective, innovation teams must map out and assess the entire value chain – “from the cradle to the grave” of the product life cycle – including congruent business ecosystems, and all relevant stakeholders. This serves to highlight issues of sustainability and risks and indicates where stakeholder interests intersect with revenue models.

Considering the full systems and their parts, teams must reevaluate how the issues and intersections evolve over time. These insights should inform a company-specific **dynamic materiality** matrix; where one axis demonstrates how important an issue is to the company from a value creation perspective, while the other axis indicates how important this issue is to collective stakeholder values sentiment.

Optimization at key points holds the potential to move mindsets from “value chain” to “value cycle” – generating new value within the product lifecycle and strengthening environmental ecosystems across markets. At the same time, overlaps in interest represent leverage points that demonstrate synergistic innovation potential and shared value.

5

EMBED GOOD STEWARDSHIP INTO PRODUCT AND SERVICE DESIGN

In order to achieve ambitious sustainability targets, businesses must move from an extractive approach to support generative design. Sustainable business models deliver value propositions that create and leverage regenerative environmental and societal surplus, often carrying accumulative secondary value.

Innovation teams must embed good stewardship as a fundamental practice to product and service design to discover new avenues to create business value while being good for the environment and society. The

responsible management of such processes embraces human-centered design to validate needs, avoid unnecessary production, and promote conscious consumption. Good stewardship explores various design methodologies and different materials to meet consumer expectations while controlling cost, using fewer resources, and complying with environmental regulations.

To evolve and transition to more sustainable, regenerative product and service alternatives, innovation teams must emulate the following design principles:

Circular Design

Circular design moves away from the traditional take-make-waste model and continuously repurposes resources to achieve a closed loop. Circularity prioritizes the re-design of products and business models to promote the reduction, repair, re-use, re-distribution, and recycling of products.

Biomimicry

Biomimicry is an approach that involves searching for solutions to technical problems by studying those already found in nature. The theory promotes learning from and then emulating natural forms, processes, and ecosystems to create more sustainable and healthier human technologies and designs.

Lean Design

Lean principles prioritize cost- and time-efficient production, delivery, and consumption. Processes are continuously improved to make use of only the absolute minimum resources required. According to [The Lean Enterprise Institute \(LEI\)](#), founded by James P. Womack and Daniel T. Jones in 1997, there are five key lean principles: identify value, map the value stream, create flow, establish pull, and seek perfection.

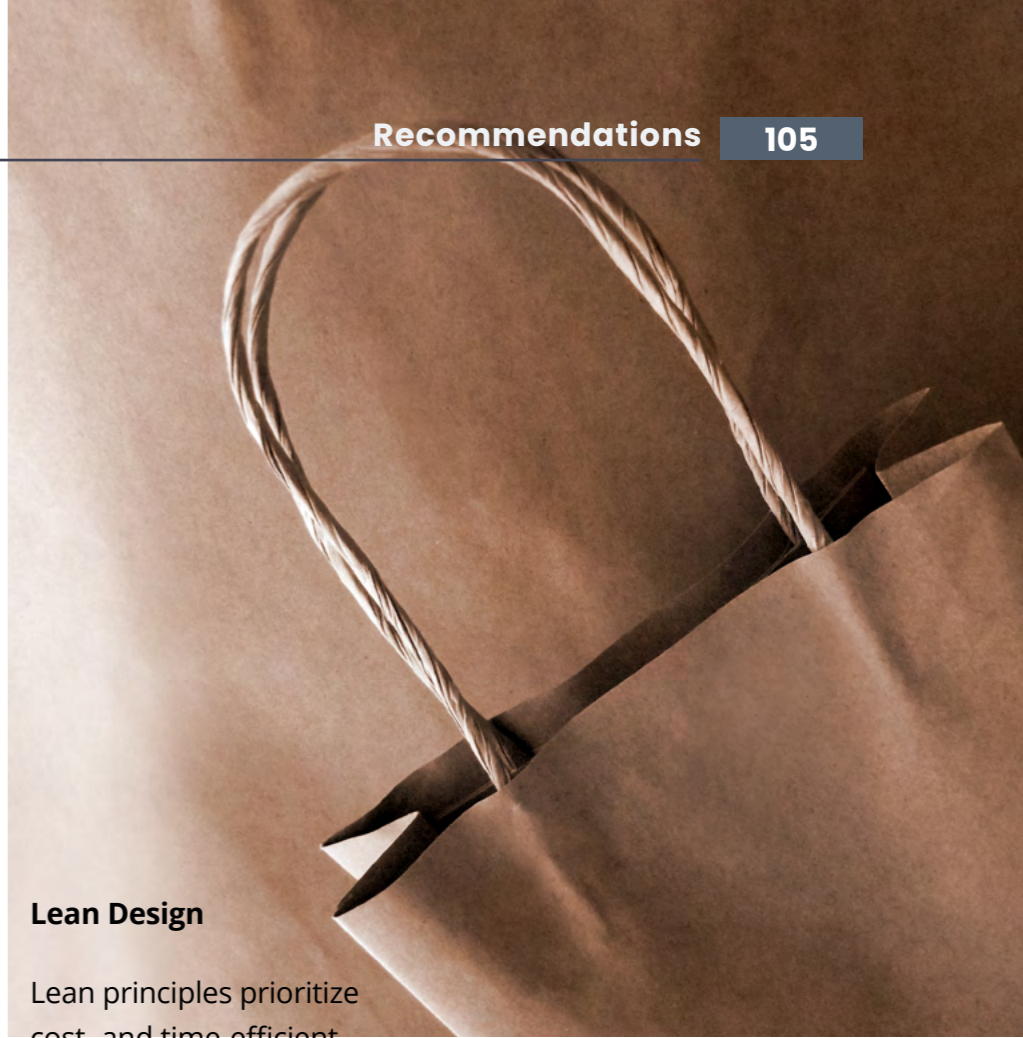
Inclusive Design

Inclusive design seeks to optimize the functionality of an environment, product, or service so that it can be accessed universally and

used by as many people as possible, regardless of age, gender, and level of ability.

Clean Design

Clean design works to prioritize energy efficiency, pollution control and sustainable resource-use systems, and negative emissions technologies. Working towards a net-zero emission future, clean design creates investable opportunities in response to demand for low-carbon products and infrastructure. The transition to a cleaner economy requires a move to lower emissions as well as a more sustainable relationship with nature.



6

MONITOR AND MANAGE NEW MEASURES OF PERFORMANCE

Triple Bottom line accounting and metrics used for the measurement of sustainability are still evolving. Yet insights on performance hold great importance in demonstrating progress and communicating value to interested stakeholders. It is critical for executives and innovators, alike to translate sustainability strategy into tangible KPIs and measurable targets that purposefully guide performance.



Sustainability involves the whole of the ecosystem and is intended to have a holistic approach. Therefore, measurements intend to involve data and knowledge from a number of academic backgrounds. In order to track and measure progress, organizations should adopt a number of metrics to assess the strength of each strategic initiative. In this way organizations must steer toward developing a wider dashboard of social and economic metrics to account for natural and social wealth stocks as well as monetized flows.

Further to this, the experimental nature of value proposition and business model design geared towards sustainability requires an iterative approach. Innovators must be sure to link critical value drivers, the performance of supply chains, and the strength of its business ecosystem to respective transformations, while also considering impact and alignment with societal actions. Due to the complex nature of the system of results, it is essential to be mindful of transparency, avoiding what might be considered as 'greenwashed' results.

This means that with each changing parameter, metrics may have to be recalibrated to measure the effectiveness of innovation efforts correctly: evaluating the fracture points in current models, the ability to scale with increasing returns and resultant impact under expansion scenarios. Once the new parameters have been identified, continuous assessment of success can be used to improve iterations of innovation initiatives to ultimately deliver the most potent combination of business, environmental and social benefits. In applying this as a continual process; consistently aligning and contributing to current-and-evolving best practices, innovation teams will be better equipped to communicate the true value and impact of their efforts to stakeholders.

THE WAY FORWARD

At ITONICS we believe that sustainability – as a transformational business megatrend – will force fundamental and persistent shifts in how companies compete. Comparable to the transitions made to meet the standards of similar movements of the past such as mass production, the IT revolution, and globalization, companies will soon gain momentum in what it means to synthesize strategy and sustainability.

In time – and, not without the hard lessons yet to be learned – best practices will emerge. Sustainability scorecards will allow companies to mitigate risks, closely monitor costs, and effectively evaluate value-creation initiatives. As technology advances to offer richer and more accurate environmental data, companies will correlate their impact in financial terms and advocate the differentiation of eco-premium products.

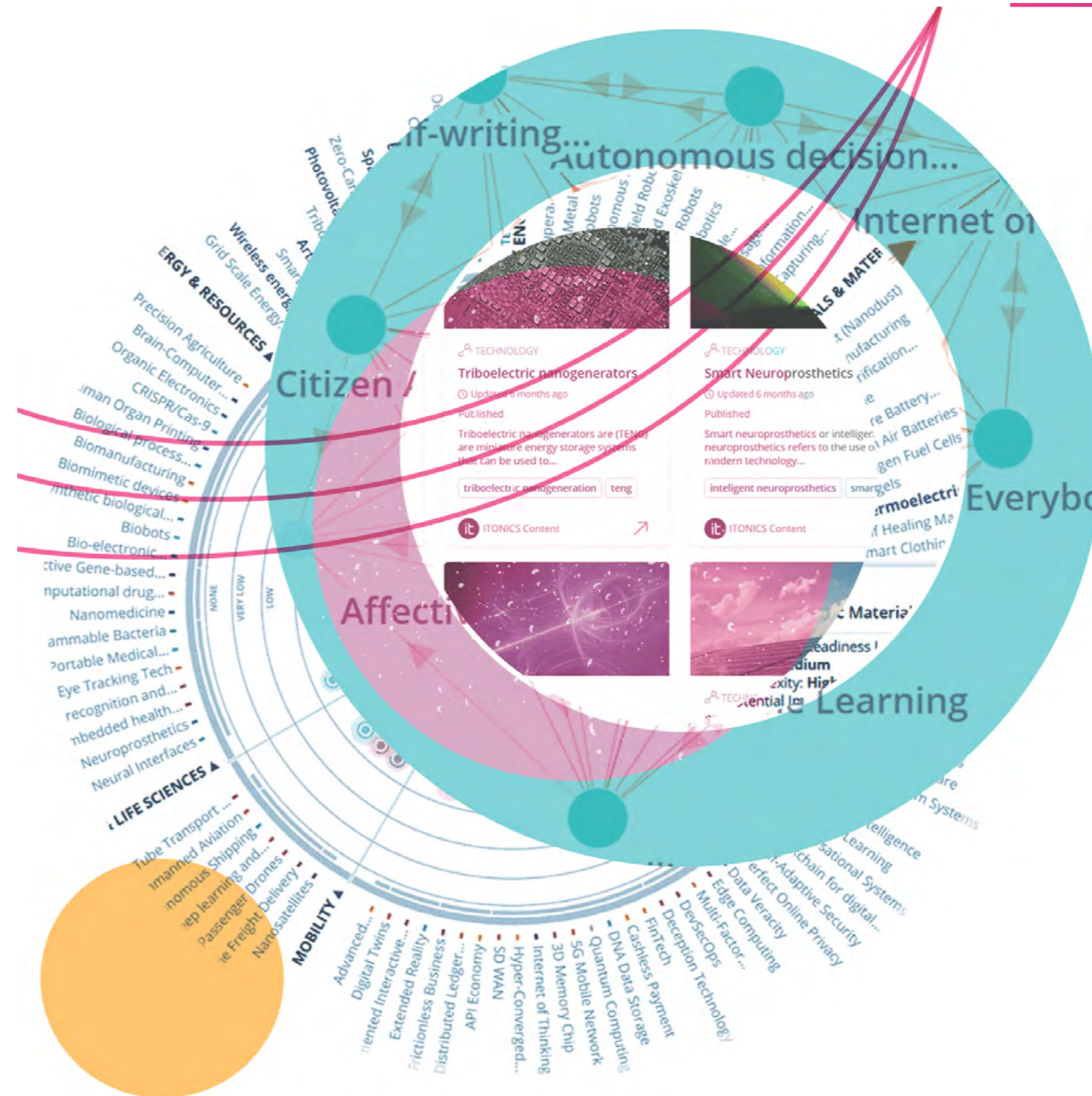
In this new world, sustainability is fully integrated and considered “business as usual” across all industries. Like megatrends of the past, the reverberations of the sustainability strategy imperative will resonate in every business function, for every employee. On the way to this future, it will be those who innovate with precision and transparency that will be best prepared with the execution capabilities to thrive. Those that fail to do so will be rendered obsolete.

A BETTER BIG PICTURE

Having the right tools to manage innovations, technologies, projects, and opportunities is vital to acting on your organization's sustainability strategy in an increasingly uncertain and dynamic world. After all, what you can't manage, you cannot change.

The systemic nature of sustainability issues and, by extension, solutions requires an integrated, holistic approach. Organizations aiming to align their efforts internally, as well as with sustainability indicators such as the Sustainable Development Goals and ESG criteria, need transparency and the vantage of the **big picture**. Teams need the ability to zoom in to specific innovation pipelines - extract insights, allocate resources, and plan timelines.

[ITONICS Innovation Cloud](#) supports the end-to-end innovation management process, from environmental scanning, and trend and technology management, to strategic foresight, innovation portfolio management and roadmapping.



Get started by exploring the [ITONICS Sustainability Radar](#) to identify the trends, technologies and risks that are relevant to your organization, customers and future development. Discover the opportunities for sustainable innovation that lie within future scenarios through the application of **strategic foresight**. The ITONICS Innovation Cloud allows you to build internal consensus and collaboration at all levels by connecting projects to an agile digital **roadmap** and therefore make better, informed decisions that support a more sustainable and prosperous future.

ABOUT ITONICS

We build AI-powered SaaS to innovate, grow, and disrupt.

Our data-driven software platform helps organizations around the globe to identify emerging technologies, trends and market potentials and to translate them into powerful growth strategies. Supported by artificial intelligence, companies can manage their entire innovation process in a modular software suite to efficiently achieve their

business goals and remain future-proof.

Working with global teams to innovate new products, services and business models, ITONICS professional services inspire, guide and accompany organizations on their innovation journey.

With more than 100 experts on 4 continents, we support innovation leaders such as adidas, Audi, CISCO, Intel, Johnson & Johnson and SAP.



As a strategic partner to key market players across all industries, we systematically advance the topics of innovation, strategy, and digitization.

WHAT'S NEXT?

Translate future trends into action

Your digital toolbox for game-changing innovation

- Industry-specific Trend and Technology Radars
- Strategic Roadmaps that guide you into the future
- Lean Portfolios to manage your innovations, technologies, projects, and opportunities

Free insights & content

- Access to 6 million+ signals to uncover insights at large scale
- 120+ trends, 100+ technologies, 2200+ curated inspirations in the platform
- Periodically updated market and technology trend insights

Innovation advisory services

- Tailor-made onboarding sessions with our consulting team
- Access to our international innovation community
- Free innovation maturity assessment

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START NOW