SUSTAINALYTICS

THEMATIC RESEARCH

10 FOR 2020: CREATING IMPACT THROUGH THEMATIC INVESTING

January 2020

Doug Morrow
Director,
Portfolio Research

Martin Vezér
Manager,
Thematic Research

About Sustainalytics

Sustainalytics is a leading independent ESG and corporate governance research, ratings and analytics firm that supports investors around the world with the development and implementation of responsible investment strategies. For over 25 years, the firm has been at the forefront of developing high-quality, innovative solutions to meet the evolving needs of global investors. Today, Sustainalytics works with hundreds of the world's leading asset managers and pension funds who incorporate ESG and corporate governance information and assessments into their investment processes. With 16 offices globally, Sustainalytics has more than 600 staff members, including over 200 analysts with varied multidisciplinary expertise across more than 40 industry groups. For more information, visit www.sustainalytics.com.

Sustainalytics
contact@sustainalytics.com

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Creating impact through thematic investing

Authors:[1]

Doug Morrow
Director, Portfolio Research
doug.morrow@sustainalytics.com

Martin Vezér, PhD
Manager, Thematic Research
martin.vezer@sustainalytics.com

Key insights

Investment themes linked to the Sustainable Development Goals (SDGs)

- We assess 10 investment themes against the SDGs to show how investors could create positive impact by investing in public equities.

Scaling big tech (SDGs 8 and 9)

- 5G will create opportunities, from optimizing service delivery to enhancing the Internet of Things (IoT), unlocking USD 13tn in economic value by 2035.
- The digitalization of the mining industry offers the twin promise of cost reductions and ESG value capture, particularly in worker health and safety.
- Organizational productivity will get a boost from the supply of industrial robots, which is forecast to reach 630,000 by 2021, up over 10x from 2009.

Health and society (SDGs 3 and 12)

- Connected medical device producers may benefit from the burgeoning IoT healthcare market, which is projected to grow to USD 136bn by 2021.
- Slow fashion can capitalize on sustainability; a recent study found over 30% of Generation Z say they are willing to pay more for sustainable products.

Ecosystem stewardship (SDGs 14 and 15)

- The new global sulphur cap for fuel oil will cost the shipping industry about USD 40-70bn in 2020 due to higher fuel and technology expenses.
- Development and cooperative banks are beginning to develop biodiversity risk protocols and factor biodiversity risk into credit assessments.

Mitigating climate change (SDGs 7, 11 and 13)

- Utilities may enjoy a market upside with battery storage, which is set to grow 13x over the next six years, reaching a 158 GWh market by 2024.
- Growing concerns about the viability of high-carbon business models are leading some oil and gas majors to diversify into low-carbon products.
- Reinsurers are addressing climate risk by readjusting premiums and using AI in climate models, with industry leaders exploring resilience bonds.

Mapping investment themes to the SDGs

Positive impact

This year's installment in our *10 for* series presents 10 ESG-inspired investment themes to consider in 2020 and beyond. In recognition of the fundamental role that the Sustainable Development Goals (SDGs) have come to play in shaping investors' sustainability roadmaps, we assess each theme against the SDGs to show how investors can potentially create positive impact while pursuing upside opportunities in the global equity market.

Introduction

Ten ESG-inspired investment themes for 2020

Provocative insight and analysis

While the content and structure of Sustainalytics' *10 for* reports have varied widely over the years, the overarching aim of the series has remained constant: to provide investors with thoughtful analysis of key environmental, social and governance (ESG) trends taking place in the economy.

The series began in 2015

Since 2015, the themes in our *10 for* series have ranged from blockchain and cybersecurity to tax avoidance and healthy eating. We have tackled modern slavery, mining fatalities and the ubiquitous theme of data privacy. Following the adoption of the Paris Agreement in 2015, we devoted the entire *10 for 2016* report to climate change. Overall, we have sought to use the *10 for* series to deliver insightful analysis on topical ESG trends for Sustainalytics' clients, and the responsible investment industry more generally, to contemplate.

Ten themes that we see developing in 2020

10 for 2020 continues this legacy. Working closely with our analyst teams, we have scoured our coverage universe of 11,000 companies to come up with 10 ESG themes for investors to consider in 2020. As shown in Exhibit 1, the themes range from 5G and connected medical devices to slow fashion and energy storage. Some of these themes may be more provocative than others, but all are based on transformative changes taking place in specific industries.

Exhibit 1: 10 for 2020

Theme	Summary	SDG	Company
5G	The fifth generation wireless technology - 5G - promises theoretical peak speeds of 10 Gbps, which is 10 times faster than 4G's peak	9 - Industry, Innovation and Infrastructure	Cisco Systems Inc
Digitalization of mining	Digitalization, automation and electrification are reshaping the mining industry, and offering the twin promise of cost reductions and ESG improvements	8 - Decent Work and Economic Growth	Anglo American Plc
Industrial automation	Global competition, efficient resource utilisation and the need for improved productivity are driving increased automation in the machinery sector	8 - Decent Work and Economic Growth	CNH Industrial NV
Connected medical devices	Connected medical devices offer the potential to improve patient care while lowering costs	3 - Good Health and Well-Being	Royal Philips NV
Slow fashion	Some brands are pivoting towards slow fashion to gain a competitive advantage and mitigate environmental and social risks	12 - Responsible Consumption and Production	Kering SA
Cleaner shipping	Shipping firms face pressure to mitigate environmental impacts as the IMO has adopted a resolution to cut sulphur and other emissions	14 - Life Below Water	AP Møller - Mærsk AS
Banking on biodiversity	Leading banks are incorporating biodiversity assessments into their decision-making process for debt financing	15 - Life on Land	De Volksbank NV
Energy storage	Batteries can help electricity grids regulate frequency and help renewables compete with gas by facilitating capacity reserve	7 - Affordable and Clean Energy	Acciona SA
Big oil transition	Some oil and gas majors are investing in an array of low-carbon products, including alternative energy assets, to diversify revenue streams	13 - Climate Action	Total SA
Reinsuring climate change	Some reinsurers are already warning that climate change could render property insurance unaffordable for large segments of the population	11 - Sustainable Cities and Communities	Swiss Re Ltd

Source: Sustainalytics

SDGs

Themes that positively contribute to the SDGs

In a major innovation in our *10 for* series, this year we assess each theme against the SDGs. This move is a recognition of the central role that the SDGs have come to play in forming the sustainability roadmaps of many investors, governments and civil society groups. We make the case that firms exposed to the themes in question could positively contribute to the achievement of applicable SDGs. For example, we argue that utilities investing in battery storage technologies can contribute to SDG 7 – Affordable and Clean Energy, and that banks capturing biodiversity risk in their credit decision-making processes can contribute to SDG 15 – Life on Land.

Exhibit 2: The Sustainable Development Goals – 17 goals to transform our world

Source: United Nations

Falling short on the SDGs?

With the world recently crossing into 2020, the 10-year countdown to achieve the SDGs by the year 2030 has begun. While the 2030 Agenda for Sustainable Development has been adopted by all UN Member States, recent progress reports issued by the European Union (EU)[2] and the United Nations[3] suggest the world is falling short of meeting most of the 17 SDGs.[4]

SDGs and investment opportunity

The SDG analysis presented in *10 for 2020* joins the growing global narrative suggesting that, for investors, contributing to the SDGs is not at cross-purposes with achieving attractive rates of return. On the contrary, we contend that the SDGs encapsulate many of the most exciting upside opportunities in today's equity markets, and are closely linked with global economic growth and overall macroeconomic health.[5]

Value add

Creating value in multiple ways

We hope that *10 for 2020* creates value both for Sustainalytics' clients and the responsible investment industry in general. We see three main potential benefits.

First and foremost, the report could help investors identify investment thematics to investigate and explore in 2020. While some investors are likely to be intimately familiar with many of the themes discussed in the report, others may not be. *10 for 2020* can help investors develop new investment theses, or think through new measures of company performance to include in security selection.

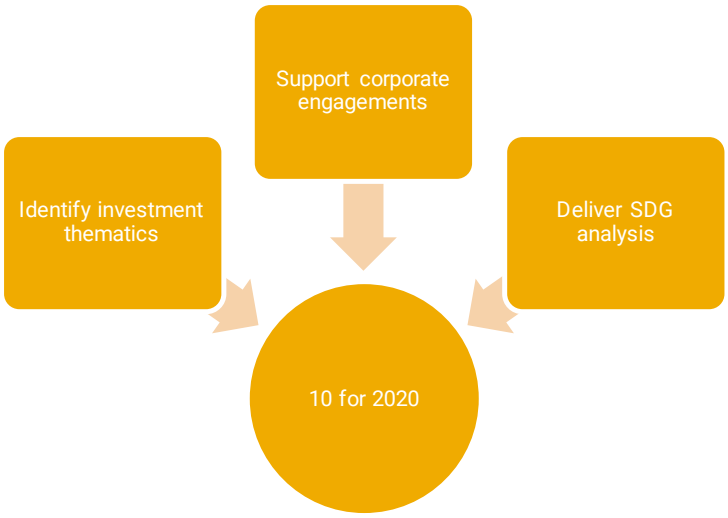
Supporting active ownership

Second, there is a clear connection between *10 for 2020* and active ownership. Investors planning to engage with their portfolio companies in 2020 on ESG risk can include the themes expounded upon in this report. Moreover, the company profiles contained at the end of each section showcase best practices that investors could use in their engagements to identity management gaps. Sustainalytics' Engagement Services, which offers engagements on two themes covered in *10 for 2020,*[6] is one way that investors can operationalize their leverage to encourage better awareness and risk management regarding these topics.

Inspiring investors

Finally, the SDG analysis presented in *10 for 2020* encourages investors to consider how their investments in portfolio companies that are exposed to specific investment themes might positively contribute to broad sustainability goals. This part of the report aims to inspire investors at the sidelines of the SDG conversation to think creatively about how SDG mandates can be fulfilled.

Exhibit 3: Value drivers of 10 for 2020



Source: Sustainalytics

ESG themes taking hold in 2020

Four broad categories

While each of the 10 themes covered in this report is unique, we group these 10 themes and articles into four overarching categories of analysis.

(1) Industries working to scale powerful technologies could create a seismic shift in how goods are manufactured and how services are delivered.

(2) Emerging trends in the production of medical devices and apparel have the potential to improve the health and well-being of people across developing and advanced economies.

(3) Industries with large environmental footprints are under increasing pressure to safeguard sensitive ecosystems, both on land and at sea.

(4) While carbon-intensive industries, including oil and gas and utilities, are hedging against transition risks by adding renewables and energy storage capacity to their inventory of assets, reinsurers are hedging against losses due to physical impacts by improving their risk analysis with advances in climate modelling.

Scaling big tech

5G, automation and mining tech

Major technological advances are reshaping the way companies do business. Multiple industries are preparing to scale a range of cutting-edge technology in 2020. Hardware and telecom firms with strong quality management and a talent for ensuring skillful execution of wireless infrastructure upgrades are well positioned to capitalize on their 5G rollouts. Human capital factors will also play a critical role in supporting the automation revolution among industrial companies, many of which will be required to upskill existing employees and onboard new, highly qualified personnel. Diversified metal miners are leveraging automation, digital twinning and virtual reality, in part to reduce fatality and injury rates and improve energy and water efficiency.

Health and society

Medical devices and apparel

Investors looking to prioritize social impact factors can consider emerging trends in sustainable production among companies in the health care and apparel industries. Connected medical device manufacturers that embed both cybersecurity and environmental factors into the design phase of their product line-ups will be well suited to tap into the growing market for connected devices, especially as the global population is aging and elder care becomes a priority in key markets. Opportunities are also emerging to invest in apparel companies that are working to create positive social impacts by implementing the principles of slow fashion and addressing issues such as fair living wages, safe working conditions and water pollution in the manufacturing process.

Ecosystem stewardship

Shipping and banking

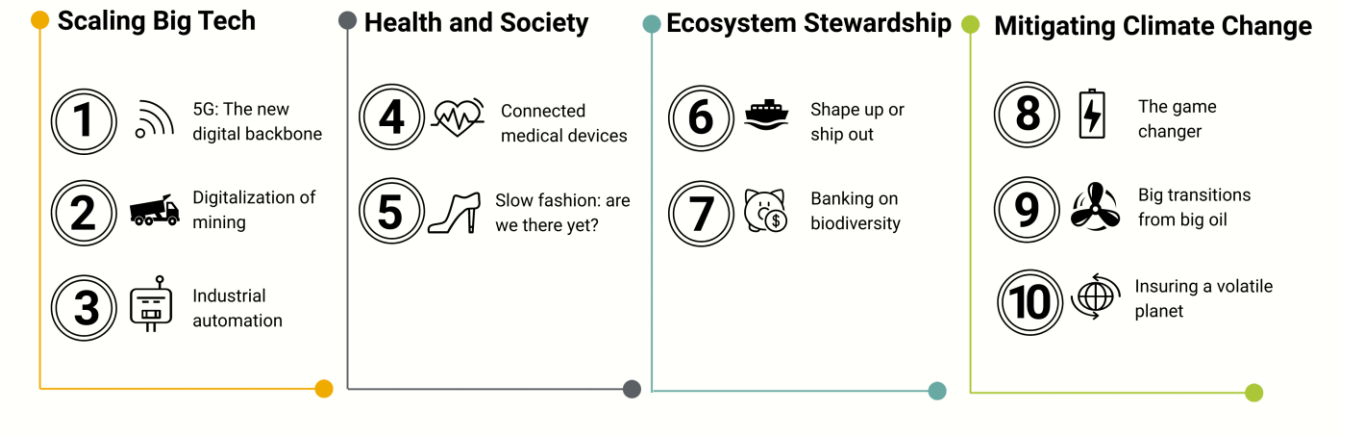
As concerns about life on land and at sea have been mounting since the 1970s, companies in high-impact industries are dialing up efforts to protect sensitive ecosystems and their reputation. Among the companies with a major environmental footprint on oceans and waterways are those in the shipping industry. The new global sulphur cap for fuel oil will require shipping companies to invest in cleaner fuels and technologies. While a wide range of human activities – from forestry to agriculture – is putting stress on terrestrial ecosystems, some banks are taking the lead in developing debt financing strategies that appreciate the importance of sustaining biodiversity.

Mitigating climate change

Oil & gas, utilities and reinsurance

The perennial topic of climate change will remain a subject for investors and corporates to tackle. Three industries stand out for renewing their efforts to address a swath of intensifying climate risks. Integrated oil and gas players are rethinking their high-carbon business models by investing in alternative energy, such as wind, solar and hydroelectric power. Utilities that are enhancing their energy storage capacity will improve their ability to address concerns about the intermittency of wind and solar power inputs. Meanwhile, reinsurance companies are taking actuarial science to the next level by doubling down on risk analysis techniques that draw on climate models, artificial intelligence (AI) and machine learning.

Exhibit 4: Four broad categories of analysis covered in 10 for 2020



Source: Sustainalytics

5G: The new digital backbone

Hype to reality

Analysts:

Moin Syed
Manager, Technology, Media and Telecommunications Research
syed.moinuddin@sustainalytics.com

Martin Vezér, PhD
Manager, Thematic Research
martin.vezer@sustainalytics.com

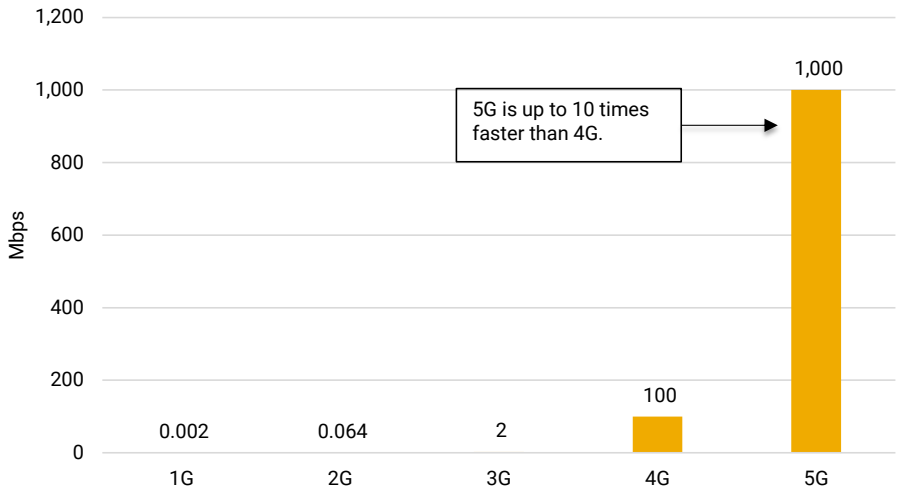
Much of the economic transformation in the 21st century has been driven by the seemingly infinite capacity to collect and process data wirelessly. However, to overcome limits of existing wireless technologies and enable capabilities required for scaling data-intensive enterprises, such as industrial automation and smart cities, the future will need a new digital backbone. The technology standard that is expected to meet society's increasingly ubiquitous computing needs is 5G.[7] While 5G has so far been available on a limited basis, 2020 will witness scaled rollouts across key markets, including the US and Europe.[8]

Used as an umbrella term for the fifth generation of wireless technologies, 5G promises theoretical peak speak speeds of 10 Gbps (compared to 1 Gbps for 4G, as shown in Exhibit 5), depending on the wireless spectrum that it runs on.[9] Another differentiator is the number of devices 5G can support: 1 million per square kilometre compared to about 100,000 per square kilometre for 4G.[10] Since it offers a lower latency rate (the delay between sending and receiving data), 5G is expected to accelerate the benefits of a wide range of other leading-edge technologies, such as the Internet of Things (IoT) and artificial intelligence (AI).[11] According to the World Economic Forum, 5G will create a range of financial opportunities by, for example, optimizing service delivery, enhancing the IoT and strengthening AI, unlocking USD 13tn in global economic value by 2035.[12]

A new digital infrastructure

Although 5G has the potential to enable efficiencies across a variety of industries, the success of firms with 5G offerings is not a given and will take time. Executing a 5G strategy demands technical talent and robust quality management as scaled rollouts will need network infrastructure upgrades.[13] In our view, hardware and telecom firms with strong human capital management and product governance will be better positioned to adapt to these challenges.

Exhibit 5: Wireless technology speed, megabits per second (Mbps)



Source: Sustainalytics

Contribution to SDGs – industry 4.0

Potential positive SDG contribution

SDG 9 – Industry, Innovation and Infrastructure – is a call to action to build resilient infrastructure and promote inclusive and sustainable industrialization. These efforts will require large volumes of real time data to be collected, transmitted and processed in real time – a capability that 5G can provide – to inform policy agendas, legislation and technical system specifications.

The improved data capacity of 5G may also help in identifying potential challenges that need to be addressed to ensure a smooth transition to the next phase of industrialization, known as "Industry 4.0." This new paradigm is driven by the integration of physical and digital systems through the IoT.[14] Specific use cases include using IoT to track physical assets in industrial environments, such as factories, to gain insights that can help identify areas of operational efficiency.[15] However, it will be up to companies to design and deliver 5G solutions with operational efficiency and sustainability as explicit value propositions.

Global efficiency gains

The speed, lower latency, reduced cost per gigabyte, and connection volume enabled by 5G networks will support several SDG 9 targets, as shown in Exhibit 6. For instance, 5G has the potential to facilitate infrastructure upgrades and industry retrofits to make them more sustainable with increased resource-use efficiency (target 9.4). It will also enhance scientific research and technological capabilities of industrial sectors in all countries, including developing ones (target 9.5).[16]

Complex with high expectations

To assess the degree to which a company's business strategy is aligned with SDG 9, investors can focus on whether it integrates circular and eco-design principles into product development strategies (target 9.4). Given the complexities and expectations associated with 5G, delivering 5G solutions that provide sustainability benefits across a value chain requires strong quality management and technical talent for ensuring skillful execution of infrastructure developments and upgrades.

Exhibit 6: SDG 9 – Target summaries

Target number	Target summary
9.1	Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all
9.2	Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and GDP, in line with national circumstances, and double its share in least developed countries
9.3	Increase the access of small-scale enterprises – particularly in developing countries – to financial services, including affordable credit, and their integration into value chains and markets
9.4	By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes
9.5	Enhance scientific research, upgrade technological capabilities of industrial sectors in all countries, in particular developing countries, encourage innovation and increase the number of research and development workers

Sources: Sustainable Development Goals Knowledge Platform,[17] Sustainalytics

Company analysis – the 5G ecosystem

Talent and quality governance are key

The Product Governance and Human Capital Material ESG Issues (MEIs) used in Sustainalytics' ESG Risk Ratings framework[18] capture many of the execution-related risks and opportunities that technology hardware and telecommunications companies face related to developing a 5G ecosystem.[19] The importance of these MEIs is driven in large part by the fact that customers are likely to prefer a strong support system, given that 5G is a nascent technology. As 5G integration accelerates, the quality of the deployment and embedded sustainability considerations will be important for ensuring widespread adoption.

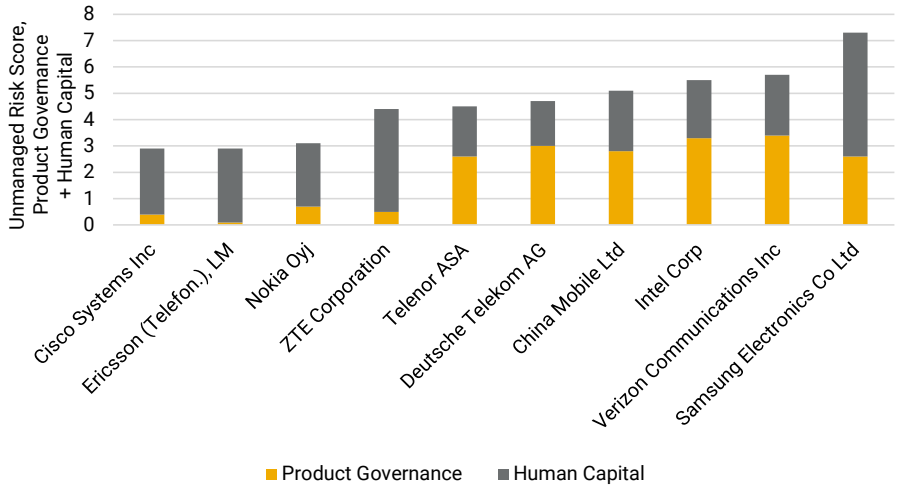
Pole position: Cisco, Nokia and Ericsson

Exhibit 7 shows the relative performance of a selection of firms within the 5G value chain. Leading the pack are Cisco, Ericsson and Nokia, companies that are well positioned to play a central role in developing the 5G ecosystem because of their well-established presence in the mobile network hardware and software space. In general, we believe these firms will be able to manage emerging 5G-driven quality risks and opportunities. All three of these firms have product development strategies that embed eco-design and externally certified quality management systems and comprehensive programmes for talent management.

Incidents signal execution risks

On the other side of the product governance and human capital risk spectrum, Intel, Verizon and Samsung face relatively higher unmanaged risk on these MEIs, which may affect their ability to capitalize on the upside associated with 5G. One factor that puts these three companies at higher risk is their track record with regard to incidents related to product or service quality in recent years. Given the complexities associated with any 5G strategy, we expect these companies to face relatively higher execution risks.

Exhibit 7: Unmanaged Risk Scores, Product Governance and Human Capital



Source: Sustainalytics

Cisco Systems

Eco-design and talent management approach supports 5G pole position

14.1 **Overall Unmanaged Risk Score**

Low Risk

1 out of 86 **Overall Unmanaged Risk Score, Subindustry Rank**

1st Percentile

2.9 **Unmanaged Risk Score, Product Governance + Human Capital**

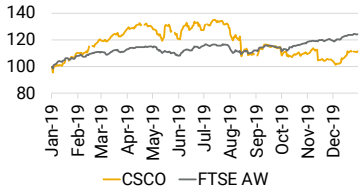
Country: United States
Industry: Technology Hardware
Subindustry: Communications Equipment
Ticker: CSCO (NASDAQ)
Mkt cap (USD mn): 203,459*
**as of 31 December 2019*

Key insights

- Cisco has a design system that integrates circular economy principles and a talent management strategy focused on continuous learning.
- The company's quality management system is ISO 9001 certified, signalling the integration of internationally accepted best practices.
- In terms of SDG 9 targets, focused on supporting developing nations, Cisco has a dedicated Country Digital Acceleration programme.

Overview

Stock price performance
CSCO vs FTSE All-World, 2019*



*Indexed 2 Jan 2019. **Source:** Bloomberg

Cisco Systems is a major player within the communications equipment and networking solutions sector. The company's product portfolio includes hardware and software for switching, routing, data centre, and wireless applications. Cisco benefits from being a partner to major 5G ecosystem actors, including other communications equipment and telecommunications companies. In 2018, the US and Australia banned their communication service providers (CSPs) from using China-based Huawei and ZTE equipment, two major global suppliers of 5G equipment and solutions, in buildouts for 5G.[20] Such a ban could potentially be implemented in other markets as reports have cited cases of the US pressuring other governments.[21] The inability for Huawei and ZTE to compete in key markets could potentially solidify Cisco's leading ecosystem position –in terms of gaining both direct consumer relationships and broader infrastructure partnerships to support SDG targets.[22]

Country Digital Acceleration

In December 2019, Cisco unveiled its Silicon One technology and strategy, the company's roadmap for the next decade of networking, focused on 5G reaching global scale.[23] Cisco has pledged USD 5bn over the next three years to support the acceleration of 5G deployments, which is complemented by a Country Digital Acceleration (CDA) programme that supports national digitization agendas.[24] Along with a formal Design for Environment (DfE) programme, Cisco has initiatives to support employees through ongoing skill upgrades and rewards programmes focused on retention, such as flexible hours and stock options.[25]

Outlook – positioned to capitalize on global 5G spending

Cisco in a promising position

Cisco has set a goal to have 100% of its new products incorporate circular design principles by 2025. The company is also a member of the Capital Equipment Coalition, a group of eight companies focused on circularity in capital equipment.[26] Alongside its comprehensive approach to human capital, Cisco is well positioned to capitalize on the forecast increase in global 5G spending.

Digitalization of mining

Out of sight, not out of mined

Analysts:

Michael Proulx
Director, Mining Research
michael.proulx@sustainalytics.com

Frances Fairhead
Associate, Mining Research
frances.fairhead@sustainalytics.com

Doug Morrow
Director, Portfolio Research
doug.morrow@sustainalytics.com

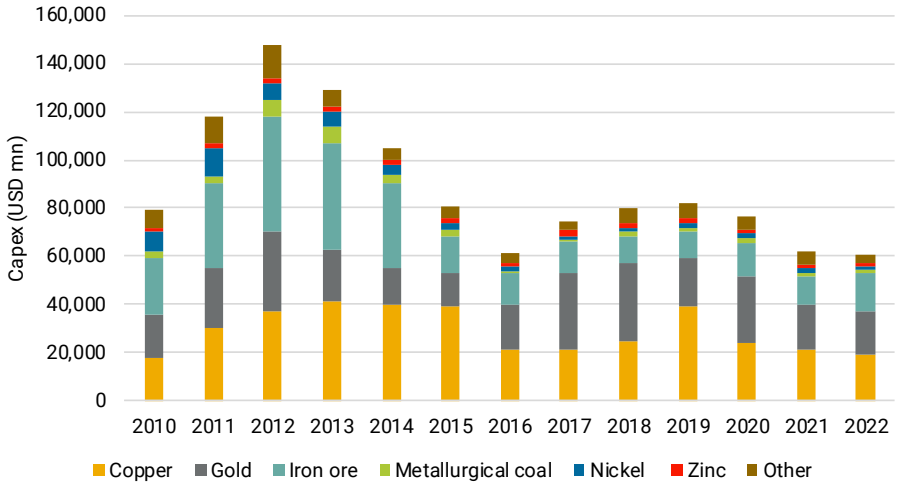
Technology in mining, as elsewhere, is disruptive. Yet the speed and scale of smarter, leaner, more flexible, more efficient and maybe even more sustainable mining is something to consider for 2020. Miners' control of the revenue side of their business is constrained by markets setting commodity prices. Therefore, to remain competitive, optimizing costs becomes compulsory. The three largest production costs for miners are wages, energy (fuel and electricity), and materials and supplies (including water). Automation, electrification and digitalization trends taking place across the industry offer not only the possibility of cost reductions but improved sustainability performance as well.

Focused investors are already thinking about technologies with near-term commercialization promise to disrupt existing value chains and business models: drones, big data, blockchain and AI-algorithms will continue to compress the distance between miners and their sustainable activities by raising awareness of how minerals are extracted and manufactured. Examples include augmented/virtual reality (AR/VR), digital twinning, and process and equipment autonomy, with sustainability benefits ranging from reduced fatalities and injury rates to improved energy efficiency and water usage.

Industry capex is forecast to decline

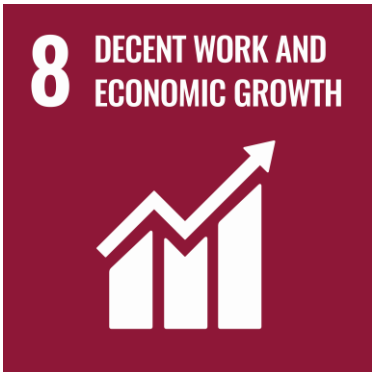
Mining firms' capex budgets are where investors looking to reap the ESG and fiscal rewards from the digitalization of mining should begin their search. Exhibit 8, which shows capex across a variety of mined commodities, anticipates a drop of USD 5.4bn, or 6.4%, from 2019 to 2020. Against this downward trend, large caps with healthy balance sheets that can draw upon large pools of financial resources are best positioned to invest in projects that harness automation, electrification and digitalization technologies. Indeed, our analysis has unearthed an emerging set of early adopters in the mining industry (see p. 16).

Exhibit 8: Forecast capex spending in the global mining industry



Sources: Sustainalytics, based on data from S&P Global Market Intelligence[27]

Potential positive SDG contribution



Contribution to SDGs – safety and technology gains

Mining companies making capital investments that digitalize, automate and electrify can contribute to multiple SDGs, though there is particular alignment with SDG 8. SDG 8 invites stakeholders to take actions to promote sustainable economic growth, while also achieving decent work and full employment for all. Examples in mining include underground electric vehicles (EVs), which reduce pollution and emissions and provide a safer and healthier working environment for machine operators (target 8.8). AR/VR technologies are a second example: remotely operated machines are increasingly removing human workers from the riskier mining activities like rock-cutting and blasting (target 8.8).

Miners are also harnessing AI to develop optimization models that boost value extraction across the mineral production chain. In some cases, miners are combining AI with blockchain technologies that qualify integrity for investors and consumers alike and promote the sustainable and responsible sourcing of minerals. In general, we believe that technology and innovation are spurs to improving both operating and sustainability performance in virtually all aspects of the mining business. Miners that digitalize, automate and electrify are more likely to operate their assets safely and sustainably to their full potential and contribute to SDG 8.

Exhibit 9: SDG 8 – Target summaries

Target number	Target summary
8.1	Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent annual GDP growth in the least developed countries
8.2	Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors
8.3	Promote development-oriented policies that support job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of enterprises, including through access to financial services
8.4	Improve progressively, through 2030, global resource efficiency and endeavour to decouple economic growth from environmental degradation with developed countries taking the lead
8.5	By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
8.6	By 2020, substantially reduce the proportion of youth not in employment, education or training
8.7	Take measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers
8.8	Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment
8.9	By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products
8.10	Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all

Sources: Sustainable Development Goals Knowledge Platform,[28] Sustainalytics

Company analysis – technology leaders

Early technology adopters

Exhibit 10 arranges a selection of mining companies from Sustainalytics' Precious Metals and Diversified Metals coverage universe that are currently piloting and implementing automation, digitalization and electrification projects in their mining assets. These firms constitute a basket of early technology adopters/leaders in the mining sector with the capex resources to adapt to, and benefit from, the increased deployment of technology in mining operations.

Crowd-sourcing platforms

Examples such as Newcrest Mining's automated crowd-sourcing platform have contributed to an improved Lost Time Injury Rate (LTIR) trend over the last three years. At Newcrest, these technological, strategic and operational tactics are founded on five pillars: safety and sustainability, valuing people, maximizing operating performance, embracing technology and innovation, and focusing on profit growth.

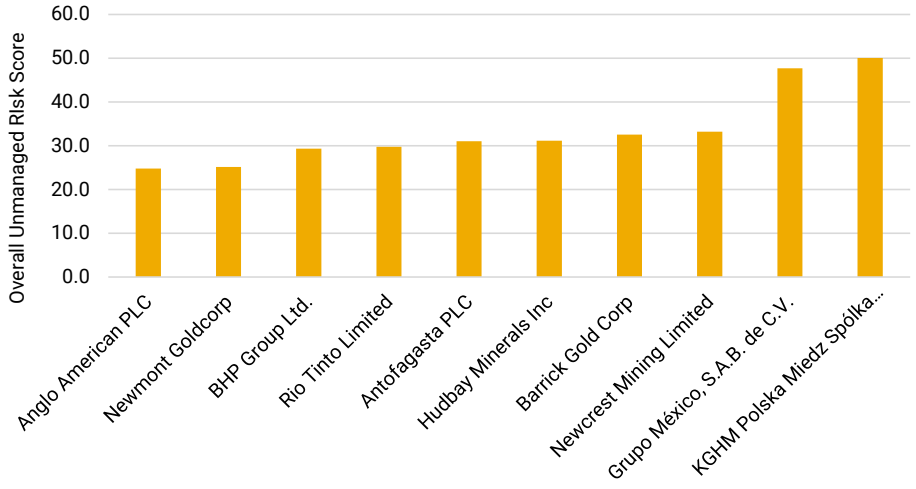
Intersection of technology and employment

A common vein through the mining companies listed in Exhibit 10 is company-wide initiatives around the intersection of technology and employment. Rio Tinto's continued adoption of Automated Haulage Systems (AHS) at three mines in Australia's Pilbara is illustrative. At a per vehicle cost of approximately USD 10,000, Rio Tinto's fleet of 74 autonomous large haul trucks consumed three quarters of a million in capex, with realized gains of 30% in fuel energy savings and lengthened maintenance schedules with reduced equipment wear and tear.

Anglo American is top

Among the early technology adopters displayed in Exhibit 10, Anglo American PLC is distinguished by its low unmanaged risk score of 24.1 (the company ranks third out of all 114 companies in the Diversified Metals industry). The company offers investors exposure to the automation, digitalization and electrification value proposition, coupled with generally effective management of ESG risks.

Exhibit 10: Unmanaged Risk Scores



Source: Sustainalytics

Anglo American PLC

Strong health and safety management supported by a proven track record

24.8 **Overall Unmanaged Risk Score**
Medium Risk

3 out of 144 **Overall Unmanaged Risk Score, Subindustry Rank**
2nd Percentile

4.2 **Unmanaged Risk Score, Occupational Health and Safety**
Medium Risk

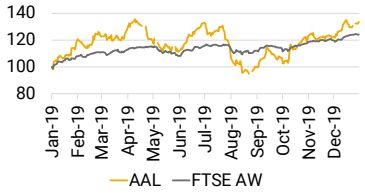
Country: United Kingdom
Industry: Diversified Metals
Subindustry: Diversified Metals Mining
Ticker: AAL (LDN)
Mkt cap (USD mn): 36,270*
**as of 31 December 2019*

Key insights

- Total production volume increases aided by the FutureSmart Mining approach to technology, digitalization and sustainability.
- The company's 2020 production forecast stands at +3%, with operational cost inflation offset by productivity and cost gains.
- Anglo American implemented an Elimination of Fatalities Taskforce in 2018 with the goal of understanding its greatest fatality risks.

Overview

Stock price performance
AAL vs FTSE All-World, 2019*



*Indexed 2 Jan 2019. **Source:** Bloomberg

Anglo American continues to advance its health and safety (H&S) record and illness costs. A comprehensive H&S management system is in place and is subject to independent OHSAS 18001 certification covering a majority of operations. Aligned with best practices, improvement targets are in place, with executive bonus pay deductions if targets are not met. The firm's worker fatality rate has improved recently, yet its reported 21 fatalities over the last three years is still considered high. Anglo American implemented an Elimination of Fatalities Taskforce in 2018, which has resulted in a nearly 50% year over year reduction in fatalities, from nine in 2017 to five in 2018.

Health and safety improvements

Anglo American's FutureSmart Mining promises to deliver innovative changes in technology and sustainability – enabling safer, more efficient, precise and sustainable mining that also boasts a reduced physical footprint. The technologies being developed and deployed are fixated on the following four areas: The concentrated, waterless, intelligent and modern mine. These areas address increased throughput volumes (+20%), water recovery rates (85%) and lowered operating costs by mining lower-grade ores, while removing equipment operators from harm's way.

Outlook – has digitalization mined the gap?

New prospects in 2019

Anglo American has pledged to invest USD 0.1-0.5bn of discretionary capital annually in its technology and innovation portfolios. The company's De Beer's unit is exploring the use of AI and blockchain technology investments that advance the goals of the Kimberly Process, which aims to reduce the flow of conflict diamonds, by constituting an ethical supply chain traceable from mine to finger. The digital transformation of mining requires significant investment in underground communications networks, the ROI and IRR of which can be seen in improved MEI scores, such as Occupational Health and Safety, and in SDG 8 contributions.

Industrial automation

Technology posing new human capital challenges

Analysts:

Visvesh Sridharan
Associate, Construction and Industrials Research
visvesh.sridharan@sustainalytics.com

Sam Goodyear
Manager, Construction and Industrials Research
sam.goodyear@sustainalytics.com

Megan Wallingford
Associate Director, Product Strategy and Development
megan.wallingford@sustainalytics.com

Doug Morrow
Director, Portfolio Research
doug.morrow@sustainalytics.com

Global competition, efficient resource utilization and the need for improved productivity are driving increased automation in the machinery sector. Workers primarily involved in repetitive low-skilled physical and cognitive tasks are increasingly vulnerable to job loss through automation. As shown in Exhibit 11, the global supply of industrial robots is forecast to reach 630,000 by 2021, up over 10 times from 60,000 in 2009.[29]

At the same time, automation offers multiple benefits to large sections of the population, including lower costs of manufactured goods and higher real incomes enabled by productivity gains. A recent Oxford Economics study found that a 1% increase in the supply of robots per worker in the manufacturing sector could lead to a 0.1% boost to output per worker across the wider workforce.[30]

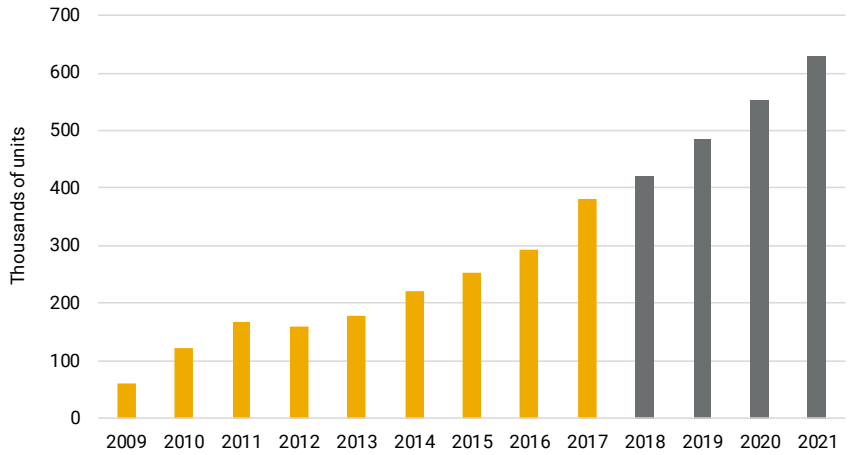
The upskilling opportunity

While automation, combined with other technological advances, could enhance the profitability of industrial firms, it is also likely to fundamentally reshape the work environment for employees. Industrial firms joining the automation revolution will need to adequately upgrade the skills of their current employees and bring highly qualified, technical skillsets into their human capital planning in order to remain competitive. According to survey data from the World Economic Forum, approximately 54% of workers will require significant re-skilling or upskilling by 2022 to stay productive and employable.[31]

Better positioned to adapt

We believe that companies in the industrial and machinery sectors that have greater institutional focus on human capital management will be better positioned to adapt to these challenges.

Exhibit 11: Estimated annual worldwide supply of industrial robots

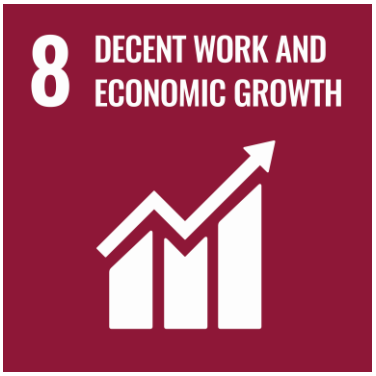


*Grey bars indicate forecast

Sources: IFR World Robotics 2018, World Economic Forum[32]

Contribution to SDGs – economic productivity

Potential positive SDG contribution



SDG 8 invites stakeholders to take actions to promote sustainable economic growth, while also achieving decent work and full employment for all. Since automation generally involves improving production efficiency by replacing manual tasks with advanced technologies, automation investment may contribute to SDG 8 both as it relates to improving economic productivity and respecting the impact on workers.

On the one hand, SDG 8 recognizes the need to leverage technological upgrades, like automation, in order to drive greater economic productivity, especially in labour-intensive sectors such as machinery (target 8.2). Furthermore, technological upgrades that lead to a net reduction in resource use are especially impactful when resource use is decoupled from production growth (target 8.4).

Taking an employee-centric approach

On the other hand, automation risks replacing low-skilled jobs, while also increasing the need for a higher-skilled workforce. Those firms engaging in automation can align with SDG 8 by taking an employee-centric approach to their transition. This may include investing in training and capacity building to upskill workers whose jobs may cease to exist; enabling employees to build healthy career trajectories in a new technological environment; taking steps to ensure the safety of their workforce is maintained amidst technological changes; and leveraging the broader workforce transition as an opportunity to bring diversity into their workplaces, offer equal opportunities and ensure fair wages for all (targets 8.5 and 8.8).

Exhibit 12: SDG 8 – Target summaries

Target number	Target summary
8.1	Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent annual GDP growth in the least developed countries
8.2	Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors
8.3	Promote development-oriented policies that support job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of enterprises, including through access to financial services
8.4	Improve progressively, through 2030, global resource efficiency and endeavour to decouple economic growth from environmental degradation with developed countries taking the lead
8.5	By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
8.6	By 2020, substantially reduce the proportion of youth not in employment, education or training
8.7	Take measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers
8.8	Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment
8.9	By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products
8.10	Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all

Sources: Sustainable Development Goals Knowledge Platform,[33] Sustainalytics

Company analysis – the human side of automation

Adapting to human capital-related risks and opportunities

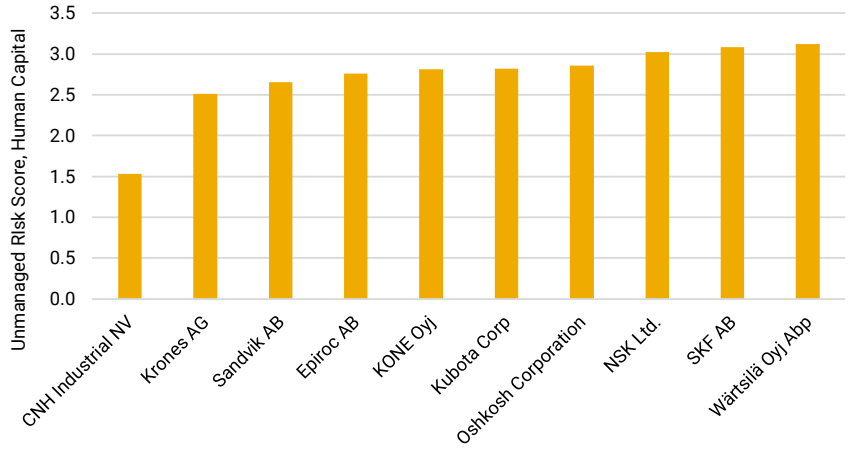
Exhibit 13 provides a selection of firms in the industrials sector with relatively low levels of unmanaged risk on the Human Capital MEI, which captures many of the employee-related risks and opportunities that companies face from the prospect of automation. In general, we believe these firms are relatively well positioned to adapt to the human capital challenges posed by automation.

For example, many of these firms have designed a strong internal life-long learning system for employees and collaborate with multiple stakeholders on workforce strategy. Others, shown in Exhibit 13, have implemented employee training programmes targeted towards improving specific skills relevant to their job and providing assistance for workers to upgrade their skills so that they are able to work with technologically advanced machinery.

Automation becoming central to company operations

As the industry evolves, automation is likely to become an integral part of companies' routine operations. We believe that companies that seek to improve their talent management by providing automation-related capacity building are best positioned to compete in the industrial sector's rapidly changing human capital landscape.

Exhibit 13: Unmanaged Risk Score, Human Capital



Source: Sustainalytics

CNH Industrial NV

Strong human capital management supported by continuous training

15.3 **Overall Unmanaged Risk Score**
Low Risk

1 out of 100 **Overall Unmanaged Risk Score, Subindustry Rank**
1st Percentile

1.5 **Unmanaged Risk Score, Human Capital**
Negligible Risk

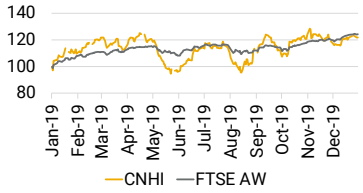
Country: United Kingdom
Industry: Machinery
Subindustry: Heavy Machinery and Trucks
Ticker: CNHI (NYSE)
Mkt cap (USD mn): 15,008*
**as of 31 December, 2019*

Key insights

- CNH Industrial has a robust human capital management programme with oversight from a dedicated chief human resources officer.
- In 2018, approximately 71% of employees received training and the firm has set a 2022 target to include all its global workforce in training programmes.
- The company has adopted novel training methods to upskill its workers to meet future demands and stay competitive.

Overview

Stock price performance
CNHI vs FTSE All-World, 2019*



*Indexed 2 Jan 2019. **Source:** Bloomberg

CNH Industrial is a global industrial company that designs, manufactures and sells agricultural equipment, construction machinery, trucks, buses, specialty vehicles and powertrains. The firm has operations in around 180 countries with 66 manufacturing plants and 54 R&D centres. Operating with a workforce of over 64,000 employees, CNH Industrial identifies employee engagement as a material topic and aligns its key targets with relevant SDGs. CNH has established formal human capital management guidelines, which include a focus on talent management and succession planning. The company's employee turnover in 2018, at 9.4%, was in line with norms across Sustainalytics' full research universe.[34]

Global learning management system

CNF applies a four-step, business-oriented training management model that includes identification, content development, programme delivery and reporting. In 2018, the company invested around USD 5.1mn in training programmes and reported a 22% increase in overall training hours compared with 2017. The training process is managed through a global learning management system and relies on the use of in-house teaching experts to enhance efficiency and promote internal knowledge sharing.

Outlook – innovative training and upgrading employee skillsets

Lower probability of experiencing material human capital risks in 2020

CNH has set goals to involve 100% of its workers in training activities by 2022. Employees are given the opportunity to identify skills that they would be interested in developing and include them in their performance and leadership management plans. The firm has also been using virtual reality simulators to train employees on working with specific components at its sites in the US and Belgium. Based on the above considerations, CNH Industrial appears well prepared to manage many of the human capital-related risks and opportunities posed by automation in 2020.

Connected medical devices

Ageing populations meet technology expansion

Analysts:

Kasey Vosburg
Manager, Healthcare & Chemicals Research
kasey.vosburg@sustainalytics.com

Martin Vezér, PhD
Manager, Thematic Research
martin.vezer@sustainalytics.com

Today, one in 11 people globally is over 65 years old. By 2050, this ratio is expected to increase to one in six.[35] Connected medical devices and the Internet of Things (IoT) offer the potential to improve elder care while lowering costs. Connected medical devices allow real-time monitoring of patient health outside hospital settings. Some of these devices can be implanted in the body (e.g. pacemakers, cardiac defibrillators), while others can be worn externally (e.g. insulin pumps, blood glucose monitors) or are stationary (e.g. monitoring, imaging and diagnostics devices). We see upside in 2020 for connected medical device producers as they form an integral part of the IoT healthcare market, which is projected to reach USD 136bn by 2021, as shown in Exhibit 14.[36]

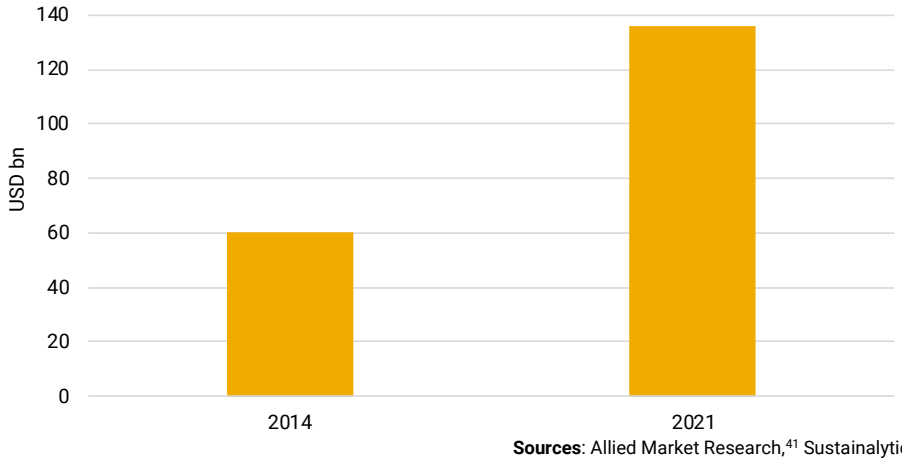
Patient safety at the heart of the issue

Although connected devices offer the potential for safer and more convenient healthcare, they can also present serious risks to patients, manufacturers and suppliers, including investable companies. Connectivity opens possibilities for remote users to access and leak user information or take control of a device and change its functionality, which could put patients' health and life at risk.[37] Regulators may soon clamp down on the industry; the US FDA recently issued an advisory warning about cybersecurity vulnerabilities in certain manufacturers' operating systems.[38] Healthcare spends more than any other industry on data breaches,[39] yet our research suggests that many firms remain underprepared.

Security and eco-design

Beyond cybersecurity, medical devices can have negative environmental impacts during their use and disposal phases, particularly when hazardous substances are used. EU regulations already restrict the use of mercury, cadmium, lead and chromium VI, and legislation is expanding to include other substances. The EU's new Medical Device Regulation introduces higher standards for performance, safety, and use of hazardous substances.[40] Firms that embed both cybersecurity and environmental considerations into the design phase will be well suited to tap into the growing market for connected devices while avoiding these risks.

Exhibit 14: projected growth IoT healthcare market



Sources: Allied Market Research,[41] Sustainalytics

Contribution to SDGs – social and environmental health

Potential positive SDG contribution

Responsible production of connected medical devices may positively contribute to at least two SDGs: SDG 3 – Good Health and Well-Being and Goal 12 – Responsible Consumption and Production.

Since wearable and implanted devices are used throughout normal daily activities, they can provide a more holistic view of a patient's health, allowing for improved diagnosis, monitoring and treatment of chronic diseases, such as diabetes and high blood pressure, and real-time health data collection and analysis (target 3.4). Telehealth, remote imaging and diagnostic devices allow healthcare professionals to access patients in rural areas or other underserved or at-risk communities (target 3.8). These advantages are highlighted by the range of connected devices featured on the World Health Organization's compendium of innovative health technologies for low-resource settings, including monitoring systems and stimulators for new-borns, virtual labour and delivery care (targets 3.1 and 3.2) and tuberculosis detection kits (target 3.3).[42]

Social and environmental impacts

Companies taking a truly SDG-centric approach to their product development will take steps to minimize negative impacts associated with the production of the devices and the environmental impacts of their use. This type of approach may result in devices that are less energy intensive (target 12.2, p. 27) and the use of lightweight, recycled materials (target 12.5) with minimal hazardous substances (target 12.4). Devices designed with environmental factors in mind may be preferred by hospitals and clinics looking to reduce their own energy use or comply with evolving public procurement standards (target 12.7).

Exhibit 15: SDG 3 – Target summaries

Target number	Target summary
3.1	By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births
3.2	By 2030, end preventable deaths of newborns and children under five years of age, and aim to reduce neonatal mortality to below 12 per 1,000 live births and under-five mortality to at least as low as 25 per 1,000 live births
3.3	By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases
3.4	By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being
3.5	Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol
3.6	By 2020, halve the number of global deaths and injuries from road traffic accidents
3.7	By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
3.8	Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all
3.9	By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

Sources: Sustainable Development Goals Knowledge Platform,[43] Sustainalytics

Company analysis – a check-up on the industry

Product governance and E&S impacts

To assess device manufacturers' abilities to mitigate social and environmental risks related to connected medical devices, we consider their relative positions on two MEIs and their involvement in cybersecurity and product safety controversies. The Product Governance MEI encapsulates several indicators related to how well a company ensures the quality and safety of its devices and addresses concerns around cybersecurity, ethical marketing and clinical trials. The E&S Impact of Products MEI assesses how well a firm mitigates negative social and environmental impacts that devices can have, with indicators focused on lifecycle environmental impact assessments and product stewardship.

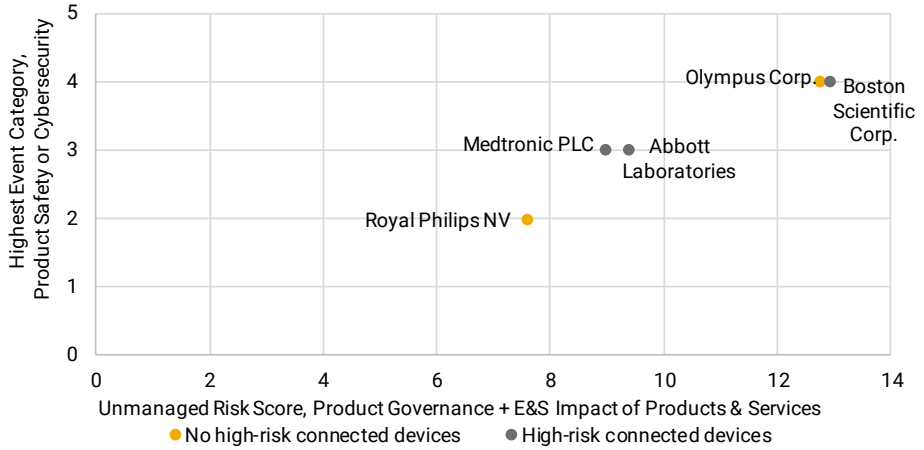
Diagnosing unmanaged risks

Exhibit 16 plots the relative positions of five high-profile firms that produce connected medical devices by combining their unmanaged risk scores on these two MEIs and mapping their record on controversies related to product safety or cybersecurity. For the purpose of this analysis, we also consider whether each firm produces high-risk medical devices, such as insulin pumps, pacemakers and spinal stimulators, which are either implanted or worn on the body at all times. The wide range of these companies' combined unmanaged risk scores on these MEIs (7.6-12.9) and event categories (2-4) suggests substantial variations in their ability to manage material risks associated with connected devices.

Boston Scientific at higher risk

Boston Scientific, a leading producer of pacemakers, transvaginal mesh and other implantable medical devices is at the higher-risk end. The company has been involved in significant (Category 4) quality and safety events, culminating with a US FDA order to stop selling two of its medical mesh lines in April 2019 due to safety concerns. This track record of quality and safety events, coupled with key management gaps, such as a lack of disclosure about the environmental impacts of its products, results in a relatively high combined unmanaged risk score on these MEIs and our overall negative view of the firm's ability to manage key risks associated with connected devices. Philips is on the lower-risk end, due to its lower risk exposure and stronger management of security issues, its focus on eco-design, and its having steered clear of relevant high impact controversies.

Exhibit 16: Medical device producers – MEIs, events and device risk*



*For this analysis, high-risk devices are implanted or permanently worn on the body.[44] **Source**: Sustainalytics

Royal Philips NV

Security by design facilitates connected care delivery

22.1 **Overall Unmanaged Risk Score**

Medium Risk

3 out of 146 **Overall Unmanaged Risk Score, Subindustry Rank**

2nd Percentile

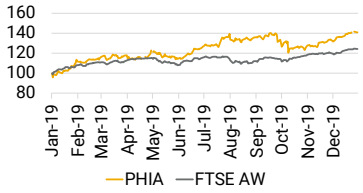
7.6 **Unmanaged Risk Score, Product Governance + E&S Impact of Products and Services**

Country: Netherlands
Industry: TBD
Subindustry: Medical Devices
Ticker: PHIA (AMS)
Mkt cap (USD mn): 43,822*
**as of 31 December 2019*

Key insights

- Philips employs a Chief Information Security Officer and Quality and Regulatory Committee to manage cybersecurity and safety issues.
- The company's HealthSuite is an integrated solution for connecting devices and services through a common, secure platform.
- In line with the company's commitment to SDGs 3, 12 and 15, Philips has a goal of generating 15% of sales from circular products and services by 2022.

Stock price performance
PHIA vs FTSE All-World, 2019*



*Indexed 2 Jan 2019. **Source:** Bloomberg

Overview

Philips is a diversified global medical device and personal health technology company. Roughly 60% of its sales come from medtech, which includes diagnostic imaging and image-guided therapy treatments as well as connected care and informatics. Despite its focus on integrated, connected care, Philips does not produce connected devices that are at the highest risk of cyberattack, such as pacemakers or insulin pumps. As a result, the firm is less exposed to product-focused ESG risks than its medical device peers. The company's shift to integrated healthcare is illustrated by its high R&D spending (9.7% of sales) and targeted acquisitions, such as Remote Diagnostics Technologies, a connected emergency care firm, and Forcare, a software solutions provider. These deals may help the firm leverage AI and data analysis to optimize care delivery.

Security by design

Philips has leading programmes that embed cybersecurity, safety and sustainability at the product design phase. The company's product security policy outlines its commitment to security by design through risk assessments and response for identified vulnerabilities in products and services. In order to measure progress on its SDG commitments, Philips uses an Environmental Profit & Loss account, based on its own product Life-Cycle Assessment methodology, to quantify the environmental footprint of its value chain.

Outlook – leveraging technology to reach more patients

New prospects in 2020

Innovative connected care solutions may help Philips reach its goal of improving the lives of 3 billion people by 2025. One example is the company's tele-intensive care eICU programme recently launched in Japan, where nearly 30% of the population is over 65. eICU uses advanced audio-visual technology and predictive analysis to provide remote patient monitoring and early intervention. With strong policies and programmes to protect patient safety, we see upside in Philips' ability to tap into the growing market for connected devices while avoiding costly cybersecurity or safety controversies.

Slow fashion: are we there yet?

Changing the pace of apparel

Analysts:

Roxana Dobre
Associate Director, Consumer Goods
roxana.dobre@sustainalytics.com

Martin Vezér, PhD
Manager, Thematic Research
martin.vezer@sustainalytics.com

While concerns about the sustainability of fast fashion have been mounting since the infamous 2013 factory collapse in Bangladesh, the recent factory fires in Delhi last month (December 2019) have reinvigorated investor scrutiny of the environmental and social conditions of garment manufacturing.

Beyond social and environmental risks, the fundamentals of the fast fashion model have also been called into question. Since American Apparel filed for bankruptcy in 2016, several big brands have been on their heels. In 2018, H&M's inventory accumulated to upwards of USD 4.3bn, outpacing sales and leading to the biggest drop in its share price in 13 years.[45] In July 2019, investor confidence in US apparel was further shaken when the year-over-year share prices for Nordstrom, Macy's and JC Penny plunged by over 40%.[46]

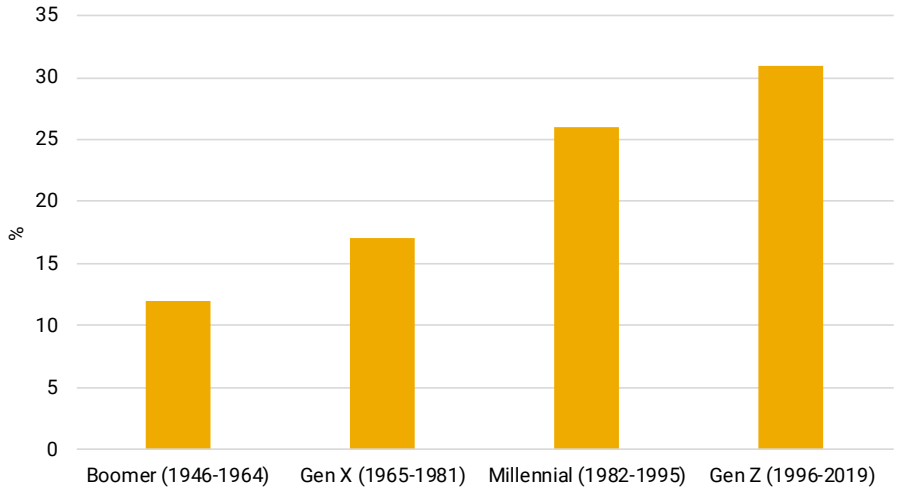
A turn for the better

Against this backdrop, some players are pivoting towards slow fashion to gain a competitive advantage and mitigate environmental and social risks. Unlike fast fashion, which aims to meet current market trends and demand with mass and rapid production, often with less concern for environmental or social impacts,[47] slow fashion puts sustainability and durability at its core. Slow fashion is not only about producing less, it is about producing in a way that is socially and environmentally conscious by addressing issues like fair living wages, safe working conditions and water pollution in the manufacturing process.[48]

Opportunity in awareness

From an opportunity angle, slow fashion leverages growing consumer awareness about sustainability. A McKinsey survey of a people in the US found that 66% of all respondents (and 75% of Millennial respondents) say they consider sustainability when making a luxury purchase. Only a minority of this group say they are willing to pay a premium for sustainable products, but over 30% of the Generation Z segment say they are willing to pay more, as shown in Exhibit 17.[49]

Exhibit 17: Percentage of US consumers in 2019 who would pay more



Sources: McKinsey,[50] Sustainalytics

Contribution to SDGs – a new look for production

Potential positive SDG contribution

At its core, SDG 12 – Responsible Consumption and Production – is a global call to reimagine consumption and production processes and patterns, aligning them with a more sustainable future. The apparel industry has a significant role to play in achieving this goal, since the industry's fast fashion-focused model has proliferated unsustainable consumption and production patterns.

Pressure is mounting on the fashion industry to contribute to SDG 12. According to the Global Fashion Agenda-Pulse report, fashion is one of the most impactful industries on the environment (target 12.2).[51] In 2018, the EU adopted the Circular Economy Package, requiring member states to ensure separate textile collection to make recycling and reusing easier (target 12.7).[52] The EU Commission is now discussing strengthening targets for textile waste reuse and recycling (target 12.5).[53] In 2019, as part of the G7 meeting in France, luxury, footwear and retail apparel firms pledged to work together to reduce environmental impacts, including biodiversity and climate change (target 12.6).[54]

Closing the loop

Investors can assess the extent to which apparel firms contribute to SDG 12 by evaluating how manufacturers and retailers implement sustainable and efficient management processes throughout their supply chains (target 12.4). Key themes to consider include the use of natural resources and environmental, social and human health impacts associated with chemical use and waste production in the manufacturing process. Some investors are already taking action on these issues through initiatives such as Fair Living Wage Platform Financials, which provides guidance for engaging with companies on social and environmental risks.[55] Such initiatives may help move the fashion industry towards a more sustainable, slow fashion-oriented era.

Exhibit 18: SDG 12 – Target summaries

Target number	Target summary
12.1	Implement the 10-year framework of programmes on sustainable consumption and production, taking into account the development and capabilities of developing countries
12.2	By 2030, achieve the sustainable management and efficient use of natural resources
12.3	By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses
12.4	By 2020, achieve the environmentally sound management of chemicals and waste throughout their life cycle and reduce their release to air, water and soil to minimize impacts on human health and the environment
12.5	By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse
12.6	Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle
12.7	Promote public procurement practices that are sustainable, in accordance with national policies and priorities
12.8	By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

Sources: Sustainable Development Goals Knowledge Platform,[56] Sustainalytics

Company analysis – suppliers in the limelight

Working conditions and E&S impacts

Human Rights and Environmental and Social (E&S) Impact of Products and Services are MEIs for the apparel industry because poor working conditions and E&S impacts associated with the manufacturing process can result in negative financial effects associated with regulatory penalties, reputational damage and litigation.[57] To manage such risks, the slow fashion business model calls for significant improvements to both labour practices in the supply chain (e.g. fair living wages and no child or forced labour), as well as selecting sustainable and long-lasting raw materials from the design phase of apparel production.

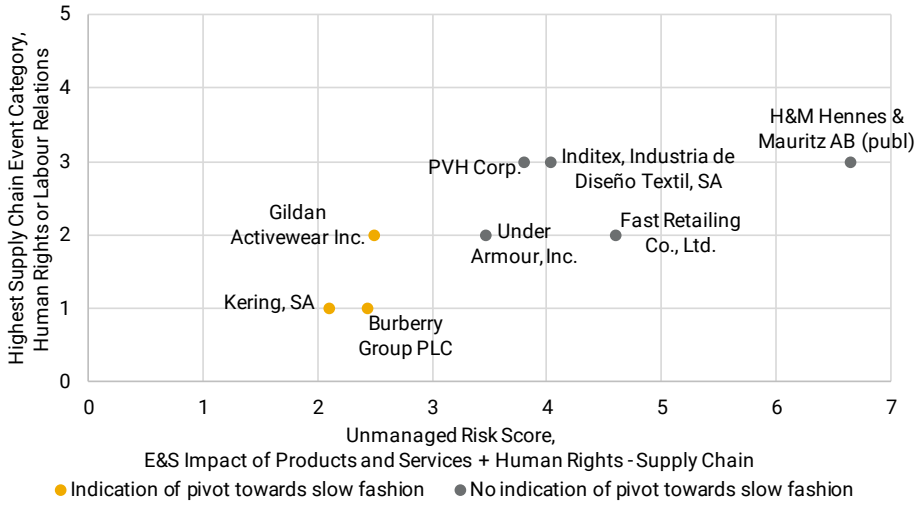
Kering, Burberry and Gildan taking lead

As shown in Exhibit 19, companies pivoting towards slow fashion, including Kering, Burberry and Gildan, appear better positioned to mitigate these risks, both in terms of their combined unmanaged risk scores on relevant MEIs and their track records when it comes to controversial events (which form part of the MEI assessment, along with ESG indicators about related policies and programmes). By embedding sustainability and conscious production in their corporate strategy, these three firms stand to benefit from shifting consumer behaviour and the increased demand for improved transparency and traceability of goods and raw materials. As vertically integrated firms with their own manufacturing facilities and smaller supply chains, we view Kering and Gildan as particularly well positioned to address issues around sourcing materials and working conditions.

H&M and Inditex falling short

At the other end of the spectrum, H&M and Inditex are rated as higher risk on E&S Impact of Products and Services and Human Rights – Supply Chain. These two firms have also been caught up in significant (Category 3) events related to the working conditions of manufactures in their supply chains. In 2019, for example, Australian broadcaster, ABC, reported that H&M was among several brands found to have sourced cotton tied to forced labour camps in Xinjiang, China. Detainees claim they were forced to work against their will in improper conditions and only allowed to leave factories once a week.[58]

Exhibit 19: Unmanaged risk and event ratings, select MEIs and event types*



*MEIs are combined by summing each firm's unmanaged risk scores on the two MEIs. **Source**: Sustainalytics

Kering, SA

Moving the needle towards sustainable fashion

12.4 **Overall Unmanaged Risk Score**

Low Risk

9 out of 96 **Overall Unmanaged Risk Score, Subindustry Rank**

9th Percentile

2.1 **Unmanaged Risk Score, E&S Impact of Products and Services + Human Rights - Supply Chain**

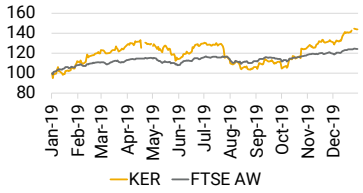
Country: France
Industry: Textiles & Apparel
Subindustry: Luxury Apparel
Ticker: KER (PAR)
Mkt cap (USD mn): 82,536*
**as of 31 December 2019*

Key insights

- Kering implemented an Environmental Profit and Loss Account to measure the financial impact of its operations and supply chain on the environment.
- The company demonstrates an enhanced awareness of sustainable design themes, from the initial planning stages to product development.
- As a signatory of the 2019 Fashion Pact, Kering appears committed to sustainability and reshaping the fashion industry by leading by example.

Overview

Stock price performance
KER vs FTSE All-World, 2019*



*Indexed 2 Jan 2019. **Source:** Bloomberg

Kering is at the forefront of sustainable production and rethinking the industry's approach to meeting consumer demand. The firm is the only one in the industry that has implemented an Environmental Profit and Loss Account, which measures the impact of its operations and supply chain (up to tier 4 suppliers) on the environment.[59] The company links its performance on water, carbon and effluent-related programmes to financial metrics, allowing it to better assess its use of natural resources. The firm identifies GHG emissions and land use as the most significant impact areas of its operations.[60]

Eco-design and the turn of the decade

Kering introduced a 2025 sustainability strategy based on three pillars – care, collaborate and create – to push for more sustainable operations and supply chains. The care and create pillars are broadly directed towards slow fashion, as they look at clear targets to achieve more transparent and more fair supply chain by 2025. The create pillar focuses on eco-design, i.e. considering the environmental impacts of a product at the design phase. Through its Material Innovation Lab, designers can choose sustainable fabrics while developing new collections. This approach is currently applicable to the ready-to-wear brands of its luxury division but is set to expand to watches and jewellery. While it still has a long way to go to meet the ideals of slow fashion, Kering appears to be on track.

Outlook – luxury is forward looking but will retail follow suit?

New prospects in 2020

Kering's 2025 strategy positions the firm as a frontrunner with respect to SDG 12, as the firm is honing its approach to responsible production. As a signatory to the 2019 Fashion Pact, Kering appears motivated to move the needle on sustainable fashion and reshape the luxury fashion industry. The challenge for Kering and other companies in the luxury space will be to encourage other fashion brands, especially those that have embraced fast fashion, to follow suit. Only then will the industry have successfully transformed into a more sustainable and fair area of the consumer economy.

Shape up or ship out

New pollution regulations are changing the game

Analysts:

Helene Gaudin
Senior Associate, Transportation and Infrastructure Research
helene.gaudin@sustainalytics.com

Martin Vezér, PhD
Manager, Thematic Research
martin.vezer@sustainalytics.com

Maritime transport is essential to the global economy because it accounts for more than 90% of international trade by volume.[61] Although it is more environmentally efficient than other modes of transport (such as air or ground), the impacts of shipping cannot be ignored. The EU Policy Department estimates that international maritime activities account for 3% of GHG emissions globally, and projects that this share could reach 10% to 17% by 2050, depending on demand and efficiency improvements, as shown in Exhibit 20.[62] Beyond carbon, maritime transport emits other pollutants, including oxides of nitrogen and sulphur, which are considerable sources of local pollution in some ports. These oxides can lead to severe illnesses, such as asthma and cancer.[63]

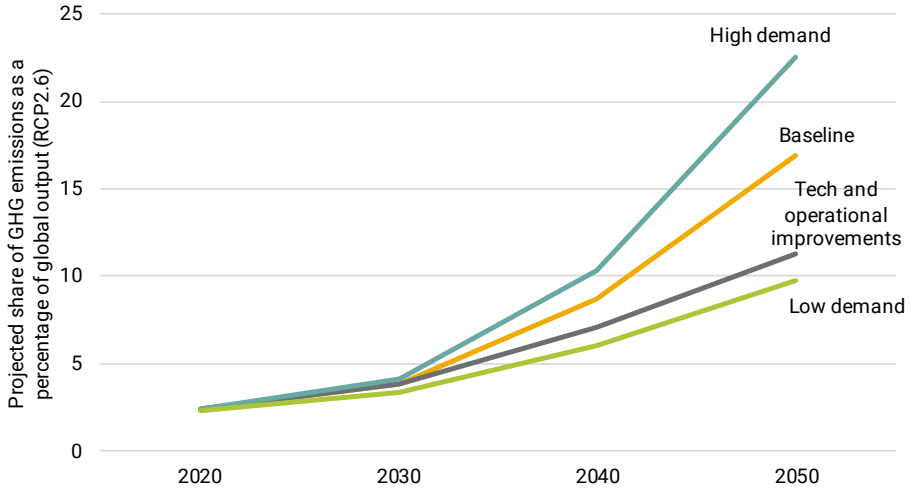
Significant environmental impacts

Effluents and waste from the shipping industry also have significant environmental impacts on marine life and seabirds. The regular evacuation of ballast and bilge water is a source of contamination and the discharge of solid waste in the sea can be fatal to marine organisms. The industry also has detrimental effects on marine mammals, through noise and vessel strikes, and on the environment through controversial shipbreaking practices.[64]

The beginning of a decade of action

The International Maritime Organization (IMO) – the UN agency responsible for safety, security and pollution prevention in shipping – declared that 2020 will mark the "beginning of a decade of action and delivery" for the shipping industry.[65] In 2018, the IMO set a 50% reduction target for GHG emissions by 2050, compared to 2008. The IMO has also adopted a resolution to cut other emissions, including sulphur. Starting from 1 January 2020, the new global sulphur cap for fuel oil is estimated to cost the industry USD 40-70bn in a full compliance scenario in 2020, due to the associated increase in fuel and technology expenses.[66]

Exhibit 20: Projected share of GHGs from the international maritime industry*



*Representative Concentration Pathway (RPCP) 2.6 is a scenario that aims to keep global warming below 2°C above pre-industrial temperatures. **Sources**: European Union Policy Department,[67] IPCC,[68] Sustainalytics

Contribution to SDGs – a three-pronged approach

Potential positive SDG contributions

Shipping can positively contribute to several SDGs, including SDG 12 – Responsible Consumption and Production, SDG 13 – Climate Action, and SDG 14 – Life Below Water. Shipping firms working to clean up their practices may offer investment exposure to opportunities related to innovative solutions for lowering carbon and other air emissions, and for reducing waste outputs that have negative impacts on oceans, water supplies and marine ecosystems.

Firms addressing responsible production will focus on maximizing the energy efficiency of current and new vessels and reducing waste by increasing the use of reused, recycled and repurposed materials for ship construction, maintenance and upgrades (targets 12.2 and 12.5, p. 27). Leading practices include achieving ISO 30000 certification for recycling and energy recovery systems.[69]

Investing in decarbonization

Regarding climate action, solutions already exist to decarbonize the industry (target 13.2, p. 43), though they come at a high cost and compete with cheap fossil fuels.[70] Leading companies and research centres are investing in scaling up low carbon solutions, such as onboard electric batteries and biofuels.[71]

Ecosystem stewardship

At a time when only 13% of the ocean can still be classified as wilderness, protecting life below water is more relevant than ever.[72] Firms focused on contributing to SDG 14 are ensuring adherence to stringent environmental standards in their operations, and adopting technologies that help protect marine ecosystems (targets 14.2 and 14.3). Innovative components and treatment systems are available to ship owners to reduce the amount of waste released into oceans and seas. For instance, to reduce sulphur emissions that cause acid rain and impact marine ecosystems, vessels can be equipped with closed-loop scrubber systems to wash exhaust gas and trap harmful substances for treatment on land.

Exhibit 21: SDG 14 – Target summaries

Target number	Target summary
14.1	By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution
14.2	By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening resilience and restoration in order to achieve healthy and productive oceans
14.3	Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels
14.4	By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans to restore fish stocks
14.5	By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information
14.6	By 2020, prohibit fisheries subsidies that contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies
14.7	By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources through sustainable management of fisheries, aquaculture and tourism

Sources: Sustainable Development Goals Knowledge Platform, [73] Sustainalytics

Company analysis – leadership in the open

Two MEIs for assessing the industry

With the launch of the IMO's targets on carbon and new rules on oxides and waste, the shipping industry is increasingly exposed to two MEIs: Carbon-Own Operations and Emissions, Effluents and Waste. Our assessment of Carbon-Own Operations for shipping companies focuses on their GHG risk management and reduction programmes, and current and historical carbon intensity. Our assessment of Emissions, Effluents and Waste evaluates company programmes on non-GHG air emissions and effluents, and relevant practices related to shipbreaking. Assessing firms on these MEIs may help investors gauge their preparedness to mitigate environmental risks and meet tightening regulations.

Firms with resources can take the lead

While solutions are already available to shipowners, most are not yet cost-effective and require large investments that many firms appear unable or unwilling to make.[74] However, larger companies that have financial resources to put towards managing growing environmental risks may set the course for the industry by setting more ambitious targets, strengthening environmental risk management systems and investing in technologies to mitigate impacts.

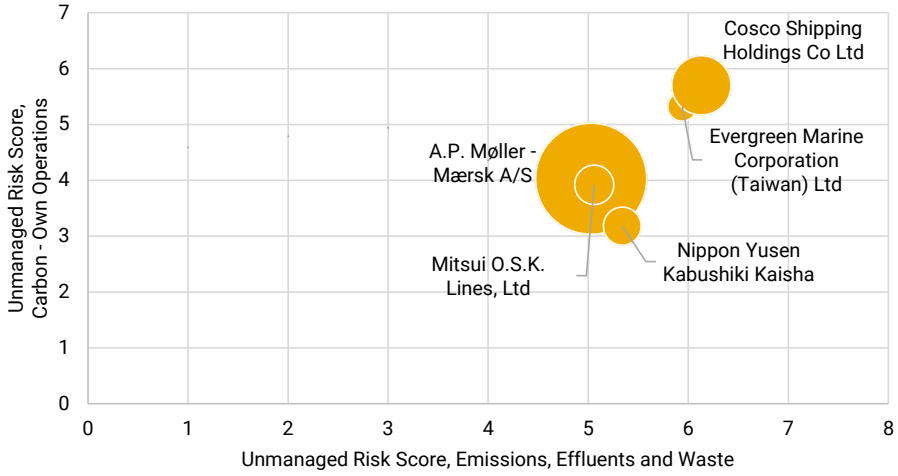
Five of the 10 biggest players in focus

The rapid consolidation of the industry has led the top 10 shipping lines to control 87% of the deep-sea market.[75] Exhibit 22 focuses on five of these firms – Mærsk, Mitsui, Nippon, Evergreen and Cosco. Plotting their relative size and position, from an unmanaged risk perspective, on two of the MEIs in our arsenal is one angle for investors to consider.

The market is underprepared

The unmanaged risk scores of these five firms on the two MEIs cluster around 4 and 6 (medium to high risk), indicating that the market is still unprepared. The higher risk scores of Evergreen and Cosco are driven by their weak management of GHG and non-GHG air emissions, and a lack of disclosure on issues related to waste management programmes for their shipbreaking activities. Mærsk – the largest firm in our sample, with a market cap of USD 29bn – is relatively well positioned on both MEIs and has the potential to have an outsized influence on the industry because it accounts for 21% of global fleet capacity.[76]

Exhibit 22: Shipping firms by market cap and unmanaged risk on two MEIs*



*Bubble size proportional to mkt cap; range USD 1.8bn (Evergreen) to USD 29bn (Mærsk). **Source**: Sustainalytics

A.P. Møller - Mærsk A/S

High hopes on the high seas

22.0 **Overall Unmanaged Risk Score**

Medium Risk

9 out of 72 **Overall Unmanaged Risk Score, Subindustry Rank**

12rd Percentile

9.1 **Unmanaged Risk Score, Carbon – Own Operations + Emissions, Effluence and Waste**

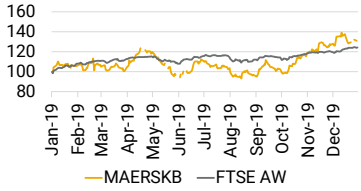
Country: Denmark
Industry: Transportation
Subindustry: Shipping
Ticker: MAERSK-B (CPH)
Mkt cap (USD mn): 29,085*
as of 31 December 2019

Key insights

- With its control of 21% of the deep-sea market, Mærsk is under pressure to maintain a competitive advantage despite increasing carbon regulations.
- The company's ambitious goal to reduce carbon emissions by 60% by 2030 will require more investment into clean innovations.
- The firm's new and upcoming projects include research into biofuels and pilot testing a battery system to improve power production.

Overview

Stock price performance
MAERSK-B vs FTSE All-World, 2019*



*Indexed 2 Jan 2019. **Source:** Bloomberg

Mærsk is the world's largest carrier by capacity, with around 711 container ships.[77] Consequently, the company has a significant carbon footprint.[78] Although its revenue-based carbon intensity is high compared to that of its peers, we anticipate that Mærsk will ratchet up its efforts to maintain its market position while protecting itself from the tightening regulatory environment.

The firm is working to develop a best-in-class carbon strategy. Climate-related risks and opportunities are covered as part of its Enterprise Risk Management system. Despite not being on track to meet its previous 2020 target, in 2018 Mærsk developed new group-wide targets for CO_2 reduction – a 60% reduction by 2030 to compared to 2008 relative to cargo moved. The company reports a 41% reduction as of 2018. Its longer-term goal aims to reach net-zero CO_2 emissions from its own operations by 2050.

Carbon – Own Operations

Mærsk's initiatives aimed at improving fleet performance include replacing older vessels with new, larger Triple-E class ships, optimizing the design of hull shapes and auxiliary systems, and investing in research into new technologies, such as sustainable fuels. Mærsk states that to achieve its 2050 goal, a commercially viable zero-carbon vessel will need to be available by 2030.[79]

Outlook – a flagship of the industry

New prospects in 2020

Mærsk is leading a coalition alongside Wallenius Walhelmsen to develop LEO fuel (a mixture of lignin and ethanol) for shipping. While the biofuel is still at laboratory scale, it will be tested on vessel engines in 2020. If successful, its production could be scaled to contribute meaningfully to reducing carbon emissions in the industry.[80] The Mærsk Cape Town vessel will test a containerized 600 kWh marine battery system in the beginning of 2020. While this innovation will not provide full electric autonomy, the batteries may still improve power production efficiency and contribute to its low-carbon solutions.[81]

Banking on biodiversity

The next frontier in green financing

Analysts:

Raquel Rodrigues
Associate, Diversified Banks Research
raquel.rodrigues@sustainalytics.com

Lilia Feghiu
Associate, Diversified Banks Research
lilia.feghiu@sustainalytics.com

Megan Wallingford
Associate Director, Product Strategy and Development
megan.wallingford@sustainalytics.com

Doug Morrow
Director, Portfolio Research
doug.morrow@sustainalytics.com

The 2020 UN Biodiversity Conference, to be held in October 2020 in Kunming, China, will be a key moment for setting up strategies to manage a critical but often overlooked macroeconomic risk: biodiversity loss. The data are startling: as shown in Exhibit 23, roughly 60% of the world's vertebrate animal species have gone extinct since 1970.[82] According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), approximately 1 million animal and plant species are currently at risk of extinction.[83] Biodiversity can be thought of as the world's "economic backbone" in the sense that it props up the natural systems that underpin economic activity.

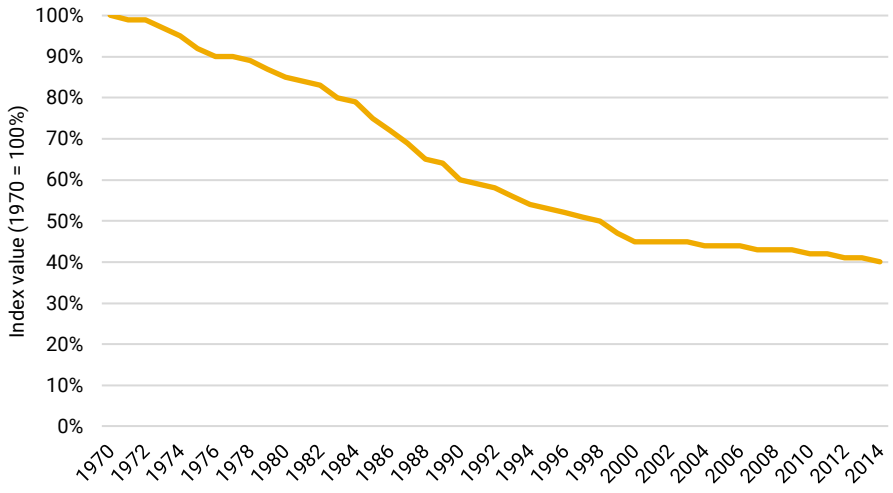
While biodiversity loss is the result of a complex web of human activities, agricultural practices, including land use intensification and the over-application of fertilizers, pesticides and fungicides, are central drivers. With the Earth's population forecast to reach 10 billion by 2050,[84] demand for sustainable agriculture is likely to intensify. Indeed, many consider it to be the main solution for improving crop yields and increasing pollinator numbers.

Improved decision-making

The benefits of assessing biodiversity risk

Incorporating biodiversity assessments into the decision-making process for debt financing stands out as a leading-edge practice in the banking industry. While such mechanisms are not (yet) common, they can potentially help reduce default rates and litigation risk. As one example, the implications of Germany's recent decision to ban the use of glyphosate (a broad spectrum herbicide) in 2023 may not be captured in a conventional due diligence process but would presumably be picked up in a biodiversity risk assessment.[85] Strategic consideration of biodiversity can also create new opportunities for banks to provide debt financing and other services to sustainable agriculture firms.

Exhibit 23: Living planet index, 1970-2014



Sources: Reproduced by Sustainalytics based on data from the Living Plant Index[86]

Contribution to SDGs – ecosystem restoration

Potential positive SDG contribution

Banks that are implementing biodiversity risk management protocols and generally improving their understanding of biodiversity loss may positively contribute to SDG 15 in several ways. For instance, by integrating biodiversity risk assessments into their debt finance decision-making criteria, banks can encourage their clients to manage their biodiversity impacts, such as their impact on protecting and restoring ecosystems (target 15.1), sustainable forestry management (target 15.2), and protection of species at risk of extinction (target 15.5).

Such assessments could include incorporating geospatial information, such as data about crop supply, into banks' credit scoring models. The Geodata for Inclusive Finance and Food (G4IFF) workstream of the Dutch Platform for Inclusive Finance (NpM) is currently adapting geodata-based applications to make them available for financial institutions.

Access to capital is a bottleneck in agricultural transition

Similarly, as access to capital is a major bottleneck in the transition to more sustainable agricultural practices, banks can potentially tailor their lending activities to target creditworthy agriculture firms that are engaged in activities aligned with SDG 15 or that are developing technologies and solutions that support the sector in transitioning to more sustainable practices. Providing financing and other financial services to such firms can have the dual impact of helping to speed up the financial sector's role in driving agricultural transition, while encouraging specific practices that contribute to SDG 15.

Exhibit 24: SDG 15 – Target summaries

Target number	Target summary
15.1	By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands
15.2	By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally
15.3	By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world
15.4	By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development
15.5	Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species
15.6	Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed
15.7	Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products
15.8	By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species
15.9	By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

Sources: Sustainable Development Goals Knowledge Platform,[87] Sustainalytics

Company analysis – promoting sustainable agriculture

The Principles for Responsible Banking are based in part on the SDGs

While biodiversity policies are not particularly common in today's financial services industry, our research has uncovered a set of early leaders that are poised to make important contributions in promoting sustainable agriculture. Many of these firms are signatories to The Principles for Responsible Banking, which were launched in September 2019 by the United Nations Environment Programme Finance Initiative (UNEP FI). The project creates a framework to develop a sustainable banking system and requires signatory banks to align their financing activities to the SDGs and the Paris Agreement.

Blended finance

Development banks leading the charge

The extent to which financial firms conduct biodiversity risk assessments falls under the ESG Integration – Financials MEI in Sustainalytics' ESG risk model. Exhibit 25 provides a selection of banks that are early adopters in developing biodiversity risk protocols. Several of these firms are development banks, such as the European Investment Bank, that use blended finance facilities to minimize biodiversity loss and promote sustainable agriculture.

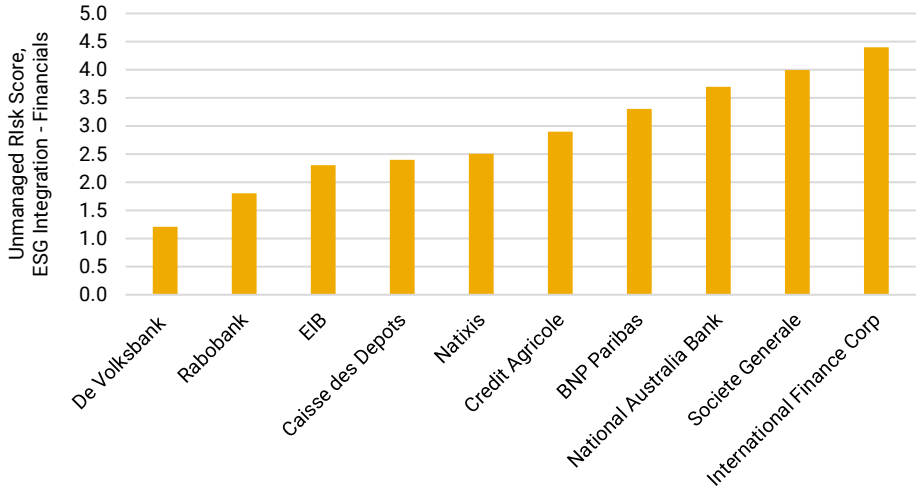
Strategic use of funds

Blended finance involves the strategic use of private and public funds for the mobilization of additional finance towards sustainable development. Blended finance schemes often include a guarantee from a government body or development bank that a portion of the loan amount will be returned to the lender if the borrower fails to repay.

Listed banks tend to trail

Our research suggests that publicly traded banks tend to trail other segments of the financial sector in addressing biodiversity risk in both credit and investment decision-making. The pioneers on this issue have mostly been development banks, as mentioned previously, as well as state-owned banks and cooperative banks. De Volksbank, a Dutch retail bank owned by the Dutch government, is distinguished as an industry leader based on its biodiversity disclosures.

Exhibit 25: Unmanaged Risk Scores, ESG Integration – Financials



Source: Sustainalytics

De Volksbank NV (ASN Bank)

Innovative steps to measuring a biodiversity footprint

13.1 **Overall Unmanaged Risk Score**
Low Risk

1 out of 389 **Overall Unmanaged Risk Score, Subindustry Rank**
1st Percentile

1.2 **Unmanaged Risk Score, ESG Integration - Financials**
Negligible Risk

Country: Netherlands
Industry: Banks
Subindustry: Regional Banks
Ticker: N/A
Mkt cap (USD mn): N/A[88]

Key insights

- ASN Bank, one of De Volksbank's brands, aims to have a net positive effect on biodiversity in 2030.
- The bank is the first in the world to establish a long-term goal on biodiversity and is a pioneer in measuring biodiversity footprints.
- ASN Bank conducts biodiversity impact screening on its loans and investments.

Overview

A methodology to measure biodiversity impacts

ASN Bank, one of the four brands of De Volksbank, is the first bank in the world to establish a long-term goal on biodiversity: by 2030 it aims to have a net positive effect on biodiversity. The target means that the biodiversity loss caused by the banks' loans and investments has to be more than outweighed by biodiversity gains from the banks' activities. To achieve these goals, the bank is developing a methodology to measure its impact and monitor its progress, which it refers to as the "Biodiversity Footprint for Financials and Industry." The impact on biodiversity is measured in terms of an increase or decrease in the number of species, using an unaffected natural habitat as a reference point. Then, this is linked to a spatial factor, which is the area where the impact takes place, and a time factor, which is the assessment period. These metrics are used across sectors and countries to come up with the number of square kilometres of natural habitat that disappears as a result of the bank's loans and investments.

Avoiding activities that contribute to biodiversity losses

ASN Bank screens projects and companies based on their biodiversity impact. The bank only finances businesses that contribute to the protection or enhancement of biodiversity, and takes measures to prevent or compensate for biodiversity threats, as defined by the Millennium Ecosystem Assessment: land use change, climate change, invasive alien species, over-exploration and pollution.[89] It also avoids activities that cause significant harm to biodiversity, such as fossil fuel production, mining and fisheries.

Outlook – developing an industry-first approach

An industry frontrunner

Through its ASN Bank brand, De Volksbank is a frontrunner in the financial services industry regarding biodiversity impact measurement. Once the methodology is completed, it will be applied to all four of the bank's brands. Measuring the biodiversity impact is essential for banks to be able to reduce their risks and to identify opportunities on biodiversity.

The game changer

Energy storage poised to redefine the Utilities industry

Analysts:

Luke Raftis
Manager, Utilities Research
luke.raftis@sustainalytics.com

Doug Morrow
Director, Portfolio Research
doug.morrow@sustainalytics.com

Renewable energy growth has been strong in recent years, with wind averaging 17% global annual capacity growth since 2015, and solar over 30%.[90] Such trends are widely expected to continue, or accelerate, driven not only by the climate imperative, but also by the improving economics of both technologies. The cost of onshore wind and utility-scale solar photovoltaic (PV) have declined 70% and 89%, respectively, over the last decade and are now the lowest-cost generation source in many regions.[91] Despite renewables' unabashed success in recent years, their fundamental weakness has not changed: we still need power when the sun is not shining and when the wind is not blowing.

Energy storage as the solution

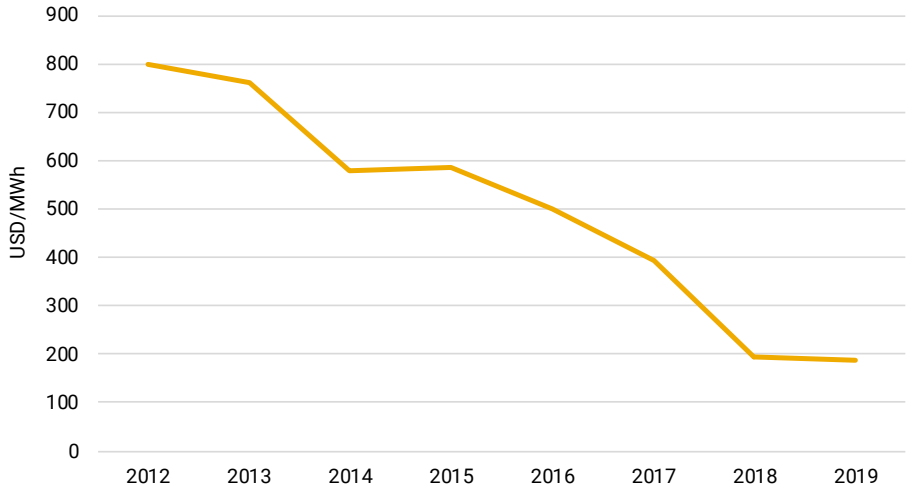
Battery storage has seen dramatic cost reductions

Energy storage has long been part of the electrical system in some regions, but the landscape has been transformed over the last decade. Whereas the market was once dominated by pumped hydro, other technologies have since reached maturity and become cost competitive. Battery storage, in particular, has seen a dramatic decrease in cost, and its flexibility has led to adoption for a wide range of use cases by the utilities that operate the grid, as well as renewable power producers, and industrial and residential customers. As shown in Exhibit 26, the levelized cost of battery storage has decreased from approximately USD 800 per MWh in 2012 to USD 186 in 2019.[92] Battery storage deployments are expected to grow thirteenfold over the next six years, reaching a 158 GWh market by 2024.[93]

Multiple applications

In addition to enabling greater levels of renewable power, batteries have many other applications. For instance, batteries can help electricity grids regulate frequency and can compete with gas-fired peaker plants as capacity reserve. Industrial and residential consumers can also employ batteries to shift the time and level of their consumption, thereby levelling out demand and reducing costs.

Exhibit 26: Levelized cost of battery storage, 2012-2019



Sources: BloombergNEF,[94] Sustainalytics

Contribution to SDGs – energy storage as an enabler

Potential positive SDG contribution

Utilities deploying energy storage projects are well positioned to contribute to the two energy and climate-related SDGs (SDG 7 and SDG 13), as well as SDG 9, which includes developing sustainable infrastructure. We focus this discussion on the industry's contribution to SDG 7, due its emphasis on ensuring access to reliable and modern energy services for all (target 7.1) and increasing the share of renewables in the global energy mix (target 7.2).

Energy storage can play, and indeed is already playing, a fundamental enabling role in unleashing a full-scale transition to renewables. The starting context: as nearly 40% of global GHG emissions come from electricity and heat production plus transportation, massive decarbonization of the electrical system and electrification of transportation will be necessary to reach the GHG emissions reduction targets spelled out in the Paris Agreement.

The most cost-effective option

Since wind and solar are now among the lowest-cost electricity sources, especially among newly constructed non-fossil fuelled options, a strategy based on significantly increased deployments of wind and solar would appear to be the most cost-effective emission mitigation strategy for the electricity sector.

Energy storage presents an elegant solution

Despite the growing cost competitiveness of renewables, utilities and grid operators must still concern themselves with the technical challenges posed by the intermittency of solar and wind. Energy storage is a primary solution to these challenges. While energy storage currently sits at the margin of most utilities' business model, we expect the status quo to change rapidly in the years to come.

Potential negative contributions

Recognizing that some activities can have positive contributions to certain SDGs and negative contributions to others, we flag that utilities investing in energy storage may negatively impact their achievement of SDGs related to supply chains and responsible production, including SDG 12. Batteries require various rare earth metals, some of which are sourced from countries with poor environmental and labour standards and, in some cases, human rights abuses. Cobalt operations in the Democratic Republic of Congo, for example, have faced accusations of poor safety, worker harassment and bribery. There are several multi-stakeholder groups involved in improving environmental and social conditions related to the extraction minerals that represent key battery components,[95] though more extensive work is necessary.

Exhibit 27: SDG 7 – Target summaries

Target number	Target summary
7.1	By 2030, ensure universal access to affordable, reliable and modern energy services
7.2	By 2030, increase substantially the share of renewable energy in the global energy mix
7.3	By 2030, double the global rate of improvement in energy efficiency

Sources: Sustainable Development Goals Knowledge Platform,[96] Sustainalytics

Company analysis – early leaders in battery storage

We expect an acceleration of energy storage investments in 2020

As previously mentioned, energy storage is currently something of a fringe activity for most utilities. The major players in the space are battery manufacturers such as Panasonic, and industrial firms, including Siemens and Tesla. However, utilities are ramping up their energy storage investments and we expect an acceleration of this trend in 2020. Within our coverage universe, utilities with significant battery storage projects include Acciona, S.A., with approximately 1,000 MW of announced and installed projects, followed by Sempra Energy (463 MW) and NextEra Energy (425 MW).

Acciona SA takes the lead in the battery storage race

In Exhibit 28, we show the rated power of battery storage projects and the overall ESG Risk Rating score for a selection of utilities in our coverage universe. Our profiled firm is Acciona, S.A, which not only leads in terms of planned battery storage capacity but also has a relatively low level of unmanaged ESG risk compared to its peers in the utilities industry. We differentiate firms on their overall ESG risk score to provide a holistic assessment of ESG risks faced by companies with different business models.

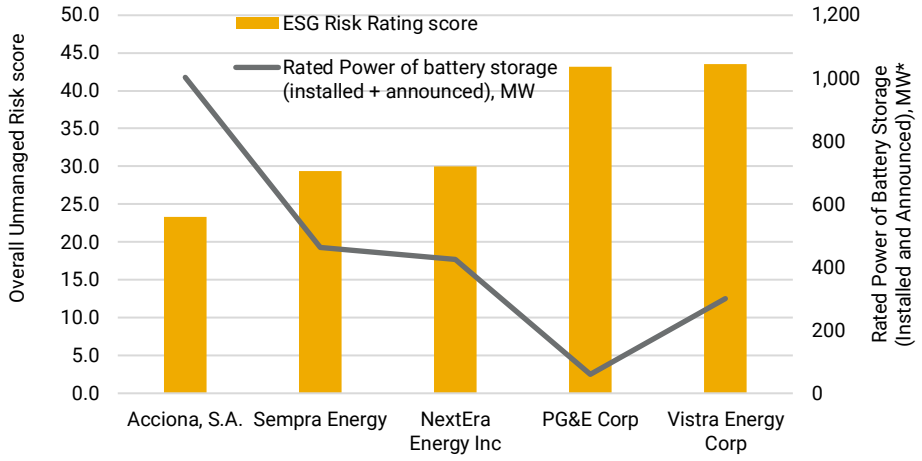
Differing levels of ESG risk

Acciona SA has no thermal generation capacity

Acciona's focus on infrastructure projects and renewable energy has minimized risks related to carbon emissions, as the firm has no thermal generation capacity. Conversely, Vistra's severe ESG risk rating score stems from its heavy reliance on fossil fuel generation, resulting in a high rating on the Carbon – Own Operations MEI. PG&E's severe risk rating score is driven primarily by exceptional exposure on the Product Governance MEI, as a result of wildfire and pipeline liability risks.

Despite Vistra's and PG&E's progress on battery deployment, the elevated risks from carbon emissions and product governance, respectively, present red flags for investors seeking utilities on a sustainable path.

Exhibit 28: Unmanaged Risk Scores and Rated Power of Battery Storage*



*Excludes pumped hydro and thermal storage

Source: Sustainalytics

Acciona, S.A.

An early battery storage leader in the Utilities industry

23.3 **Overall Unmanaged Risk Score**
Medium Risk

4 out of 51 **Overall Unmanaged Risk Score, Subindustry Rank**
7th Percentile

2.3 **Unmanaged Risk Score, Occupational Health and Safety**
Low Risk

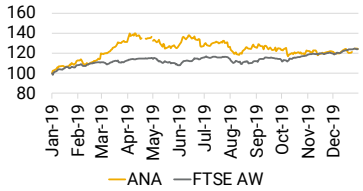
Country: Spain
Industry: Utilities
Subindustry: Multi-Utilities
Ticker: ANA (BME)
Mkt cap (USD mn): 5,778*
**as of 31 December 2019*

Key insights

- The company announced plans to acquire 1,000 MW of battery storage, all coupled to 3,000 MW of new solar PV sites, 40% installed by 2023.
- Acciona has major construction, engineering, infrastructure and water segments, but derives 60% of EBITDA from renewables.
- The company operates 9 GW of renewable capacity and has no thermal power assets.

Overview

Stock price performance
ANA vs FTSE All-World Index, 2019*



*Indexed 2 Jan 2019. **Source:** Bloomberg

Spanish utility, Acciona S.A. has been heavily involved in the construction and operation of renewable energy assets for decades, often at the leading edge of new technologies. The company built the first large-scale concentrating solar power (CSP) plant, the 64 MW Nevada Solar One, in 2007 and has since been involved, either as an operator or contractor, in many of the largest solar thermal plants globally. CSP projects typically have a large amount of thermal storage, allowing them to continue generating power through the evening demand peak. While the company continues to build CSP plants for other customers, Acciona has sold off most of its own CSP assets.

A latecomer to the battery storage game

Like many utilities, Acciona implemented modest amounts of battery storage in previous years, first providing ancillary services to the grid, such as voltage and frequency regulation, and then more recently coupling storage with wind farms. Until recently, most of the largest battery projects were implemented by companies with major grid operations, for purposes related to stability and resiliency, including adding capacity, deferring distribution upgrades, demand response, or assisting with restart during blackouts. Acciona's lack of grid operations has made it somewhat of a latecomer to the battery storage game.

Outlook – bolstering battery storage

Rolling out 1,000 MW of storage

In October 2019, the company announced plans to acquire a portfolio of 1,000 MW of storage, all of it coupled with 3,000 MW of PV solar plants in the US. While these projects will not all be rolled out immediately, roughly 40% are planned for 2021-2023. Even 40% of these projects would make Acciona the second largest battery operator in the world, though other companies continue to announce major new storage projects regularly, so this title will likely be hotly contested. Nonetheless, Acciona's announcement marks a turning point for both the company and the role that batteries are expected to play in the future.

Big transitions from big oil

Aiming to be on the right side of history

Analysts:

Jonathon Smith
Associate, Oil & Gas Research
jonathon.smith@sustainalytics.com

Doug Morrow
Director, Portfolio Research
doug.morrow@sustainalytics.com

As humanity continues to struggle with the existential threat that is climate change, oil and gas companies themselves now face a dilemma of similar significance. By the end of 2017, new discoveries of oil and gas were at their lowest levels since the early 1950s. With new reserves that are both large and commercially viable becoming increasingly rare, global spending on exploration dipped from a high of US 153bn in 2014 to about USD 58bn in 2017.[97] Although significant discoveries in countries like Guyana between 2018 and 2019 have revived spending,[98] the growing concern that investors have over the viability of high-carbon business models in an increasingly carbon-constrained economy has prompted some of the largest oil and gas firms to question their long-term business strategy.

Pivot to sustainability

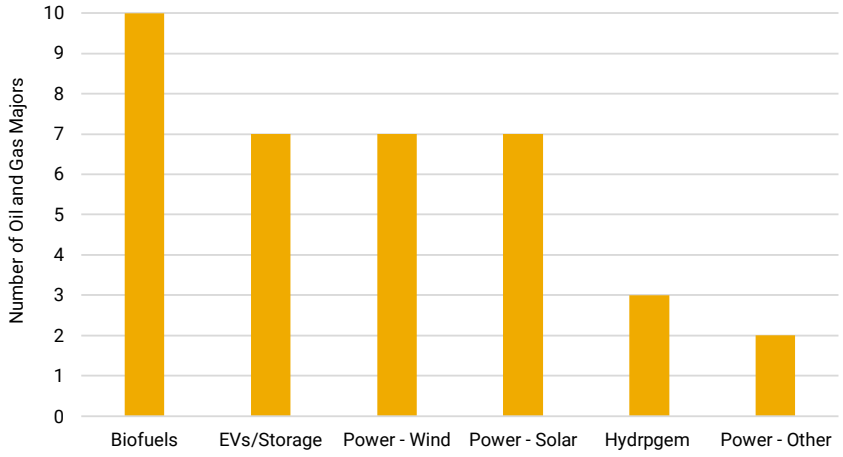
Alternative revenue streams

Beyond routine flaring reduction,[99] and the integration of carbon capture and storage (CCS) and efficiency technologies into their own operations,[100] which are widely practiced in the industry, some oil and gas companies have been investing in alternative energy assets to enhance their overall revenues, with some doing so quite aggressively.

Oil and gas majors and low-carbon products

As shown in Exhibit 29, oil and gas majors are involved in a range of low-carbon products and services. Biofuels – which typically require the least amount of committed infrastructure – are currently the most common alternative energy product that oil and gas firms are adding to their portfolio, although we anticipate the EVs/Storage and Power segments to generate more revenue for companies in 2020 and beyond. Although these investments should not be confused with the oil and gas industry's core (fossil-based) product, they demonstrate the efforts that oil majors are making to compete in an increasingly carbon-constrained economy.

Exhibit 29: Participation of oil and gas majors in low-carbon products*



*Royal Dutch Shell, Total S.A., Chevron, ExxonMobil, Eni, Repsol, BP, ConocoPhillips, Lukoil and Suncor

Source: Sustainalytics

Contribution to SDGs – decarbonizing revenue streams

Potential positive SDG contribution

Ambitious climate change mitigation actions are essential to meeting the targets affirmed in the Paris Agreement and achieving sustainable development more broadly.[101] Although it is well established that the generation and consumption of fossil fuels – the main product of the oil and gas industry – is the single largest contributor to rising global temperatures, increasing decarbonization efforts from within the oil and gas industry have significant potential to help limit the increase in global average temperatures to 1.5°C above pre-industrial levels.

While many critics doubt the ability of "Big Oil" to transition away from its dependence on the sale of fossil fuels, many companies in the industry are, in fact, already making advancements in the area of decarbonization (i.e. investing in and developing renewables and other low-carbon energy products and services).

Core business misaligned

Such efforts create a unique situation from an SDG perspective. On the one hand, the core business of the oil and gas industry, which includes the exploration, extraction, refining, transportation and marketing of hydrocarbons, is fundamentally misaligned with the achievement of multiple SDGs, particularly SDG 13.

Potential for positive contributions

On the other hand, the predominance of fossil fuels in the industry's business model does not necessarily preclude the possibility that the industry can engage in activities that contribute to certain SDGs, especially if these activities, such as making changes to their project planning and diversifying their revenue streams, indicate a potential move toward more sustainable business practices. For instance, those firms that are serious about climate action are integrating climate change considerations into their business planning, which commonly takes the form of investments in renewable energy projects or ventures.

While oil and gas companies can thus engage in a range of activities that contribute to SDG 13, alignment with the SDGs will ultimately require that the oil and gas industry fully transition from fossil fuels to sustainable alternatives.

Exhibit 30: SDG 13 – Target summaries

Target number	Target summary
13.1	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
13.2	Integrate climate change measures into national policies, strategies and planning
13.3	Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

Sources: Sustainable Development Goals Knowledge Platform,[102] Sustainalytics

Company analysis – low-carbon segments

Some companies are further along the curve than others

Exhibit 31 shows unmanaged risk scores on the Carbon – Products and Services MEI, as well as the underlying GHG Risk Management indicator, for 10 oil and gas majors in Sustainalytics' coverage universe. With the exception of ExxonMobil, all companies have an MEI score in the medium risk category (i.e. unmanaged risk scores between 4 and 6). Those with lower scores, including Total S.A., Repsol and Suncor, are further along in their sustainability transition and typically have a portfolio of products and services that extends beyond conventional oil and gas.

Total S.A. is actively engaged in renewable energy

Repsol, for example, is actively engaged in the generation of both wind and solar energy, as well as hydroelectric power (through its asset acquisition from Viego in Spain).[103] Other companies, like Shell, Eni, Suncor, are also expanding their business models to include low-carbon offerings, particularly in the segments focused on EV/Storage. As profiled on the following page, Total S.A. is also actively engaged in multiple alternative energy offerings.

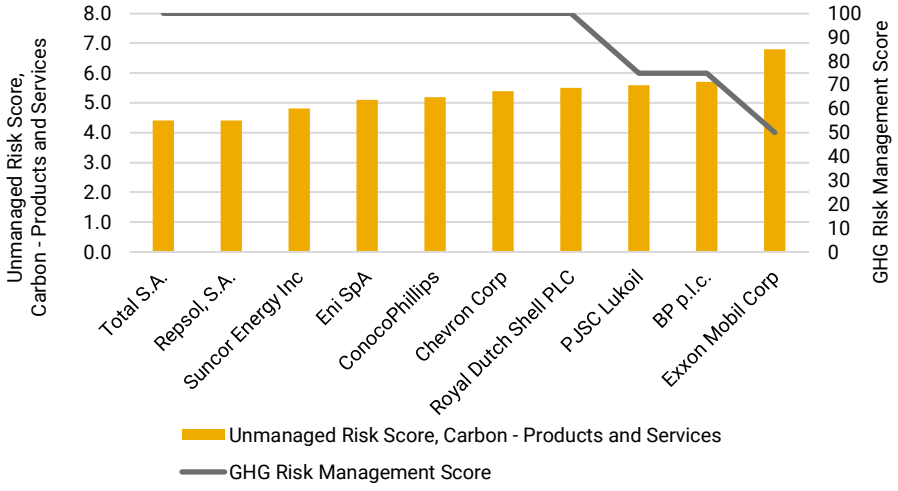
Strong GHG risk management

Companies that are effectively managing transitional risk to a low-carbon economy also tend to have strong GHG risk oversight for their conventional oil and gas activities. Of the 10 companies shown in Exhibit 31, seven receive the top score of 100 on the GHG Risk Management indicator, which reveals commitments to manage the regulatory risks related to climate change, detailed reporting and managerial or board-level responsibility for addressing transitional risk.

Eliminating routine flaring

Those companies that are effectively managing transitional risk are also those that typically formally support global emission reduction pledges such as the World Bank's Zero Routine Flaring by 2030 initiative. Of the companies shown in Exhibit 31, only Chevron Corp, ConocoPhillips and ExxonMobil – all of which are based in the US – have not committed to eliminating routine flaring within the next 10 years.[104]

Exhibit 31: Unmanaged Risk Score, Carbon – Products and Services



Source: Sustainalytics

Total S.A.

Diverse business segments mitigate risk in a low-carbon future

27.0 **Overall Unmanaged Risk Score**

Medium Risk

10 out of 276 **Overall Unmanaged Risk Score, Subindustry Rank**

4th Percentile

4.4 **Unmanaged Risk Score, Carbon – Products and Services**

Medium Risk

Country: France
Industry: Oil & Gas Producers
Subindustry: Integrated Oil & Gas
Ticker: FP (EPA)
Mkt cap (USD mn): 143,745*
**as of 31 December, 2019*

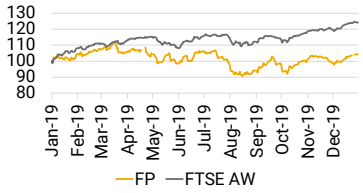
Key insights

- Over two-thirds of 2018 revenues were generated from Total's refining and chemicals business segment.
- The company is engaged in multiple alternative energy technologies, including renewables, hydrogen, EV technology and biofuels.
- Organic investments in the company's Gas, Renewables and Power business segment totalled USD 500mn in 2018 alone.

Overview

Total has largely been successful in reducing the overall carbon impact of its products. The company has continuously reduced the carbon intensity of its operations and, since 2015, and has been able to reduce its overall scope 3 emissions (including carbon associated directly with the products it sells). Diversification has also helped the company remain relatively resilient to transitional risk.

Stock price performance
FP vs FTSE All-World, 2019*



*Indexed 2 Jan 2019. **Source:** Bloomberg

Research and development (R&D) was just shy of USD 1bn in 2018, although this value reflects more than its investment in low-carbon technologies. Broadly, the company's R&D falls into five categories: safety, operational efficiency, new services and products (including smart electricity grids), an energy mix focused on low-carbon energies, and digital technology.

Outlook – further rapid growth of low-carbon offerings

Lower probability of experiencing material human capital risks in 2020

According to its latest annual report, Total has the capacity to produce 2.7 GW of low-carbon electricity from gas and renewables worldwide. In late 2017, Total acquired a 23% interest in Eren Renewable Energy (now named Total Enen), which manages renewable energy projects in developing markets, primarily located in Africa, Latin America and Asia-Pacific. In 2018, Total added a further 0.7 GW to its gross installed capacity through the acquisition of Direct Énergie, which operates a portfolio of roughly 213 onshore wind, solar, hydroelectric and biogas assets in France through its subsidiary, Quadran.[105] As Total continues to further its stake in the power sector, we anticipate it will become increasingly well positioned to generate positive returns in an increasingly carbon-restrictive environment.

Insuring a volatile planet

Climate impacts threaten reinsurers

Analysts:

Jean-Francois Obregon
Manager, Insurance, Real Estate and Asset Management Research
jean-francois.obregon@sustainalytics.com

Justin Cheng
Associate, Insurance, Real Estate and Asset Management Research
justin.cheng@sustainalytics.com

Megan Wallingford
Associate Director, Product Strategy and Development
megan.wallingford@sustainalytics.com

Doug Morrow
Director, Portfolio Research
doug.morrow@sustainalytics.com

Insurers may be in the business of pricing risk, but there is growing concern that industry models may be struggling to accurately predict the seemingly ever-growing frequency of wildfires, hurricanes and floods. For reinsurers, which provide insurance to primary insurers, failure to predict such events could result in improperly calculated risk exposures and increased losses. As shown in Exhibit 32, the number of relevant natural loss events grew from 249 in 1980 to 849 in 2018, an increase of over 200%.

Competitive response

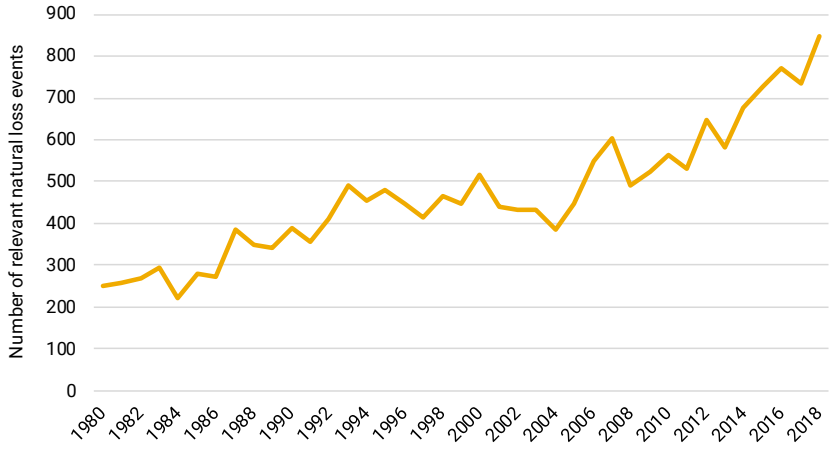
The reinsurance industry is responding to the growing threat of climate risk in a multitude of ways. Like primary insurers, reinsurers are readjusting premiums on property and casualty policies, especially in regions that are particularly prone to the physical impacts of climate change. Some reinsurers are already warning that climate change could render property insurance unaffordable for large segments of the population.[106]

Reinsurers are naturally looking to improve the accuracy of their climate models. While predicting the scope and intensity of climate impacts is clearly a daunting exercise, the industry is increasingly harnessing artificial intelligence (AI) to develop improved weather models over smaller grid areas. For instance, Munich Re's AQUALYTIX initiative uses machine learning to identify risk drivers for water-mains damage.[107]

Market interest in cat bonds and resilience bonds is mounting

Mounting climate risk is also driving the market's interest in both catastrophe (cat) bonds and resilience bonds. The market for cat bonds was estimated at USD 36.6bn in August 2019, up from USD 17.2bn in August 2006.[108] The market for resilience bonds is far less mature, but these instruments offer a potentially transformative solution in reducing municipalities' exposure to the physical impacts of climate change.[109]

Exhibit 32: Number of relevant natural loss events, 1980-2018



Sources: NatCatSERVICE, Sustainalytics[110]

Contribution to SDGs – recalibrating risk models

Potential positive SDG contribution

SDG 11 aims to ensure cities and communities are sustainable, inclusive, safe and resilient. Reinsurance companies that are improving their modelling of climate risk and innovating new risk transfer mechanisms, principally resilience bonds, can contribute to SDG 11.

Reinsurers that are leveraging AI and machine learning techniques to improve their climate modelling can more accurately identify areas of increasing natural disaster risks. SDG-focused firms then engage with cities and communities to share the improved climate-risk insights in order to support the public sector in reducing risks and improving resilience policies and programmes. In addition, through premium pricing that more accurately reflects the probability of climate catastrophes, reinsurers and primary insurers can nudge communities towards investing in more resilient infrastructure (targets 11.3 and 11.5).

Resilience bonds remain at the concept stage

Resilience bonds are a variation on cat bonds, whereby insurers take the expected impact of planned infrastructure improvements into account when pricing premiums.[111] This approach provides additional financing for cities to invest in resilience measures, such as building seawalls, and could contribute to improved disaster management (target 11.5).

While resilience bonds are in their infancy, they have experienced significant developments in recent months, and we expect the reinsurance sector's activity to increase in this area in 2020. The European Bank for Reconstruction and Development issued the world's first resilience bond worth USD 700mn in September 2019.[112] The same month saw the publication of the Climate Resilience Principles,[113] and the launch of the Coalition for Climate Resilient Investment, which includes Willis Towers Watson and Zurich Insurance Group among its members.[114]

Exhibit 33: SDG 11 – Target summaries

Target number	Target summary
11.1	By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums
11.2	By 2030, provide access to sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations
11.3	By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries
11.4	Strengthen efforts to protect and safeguard the world's cultural and natural heritage
11.5	By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global GDP caused by disasters, including water-related disasters
11.6	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
11.7	By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities

Sources: Sustainable Development Goals Knowledge Platform,[115] Sustainalytics

Company analysis – climate-related products

ESG risks in underwriting standards

The ESG Integration – Financials MEI addresses how reinsurers are integrating environmental and social risks in their underwriting standards and how they manage their exposure to natural hazard risks. Exhibit 34 shows a selection of reinsurers from our coverage universe and their scores on this MEI.

Advanced measures to capture climate risk

Many of the firms listed in Exhibit 34 are not effectively managing their risk exposure, with scores in the high-risk range (i.e. scores between 6 and 8). However, a handful have low and negligible risk scores: Swiss Re, Munich Re and Hanover Rueck SE. Their low scores are due, in large part, to advanced measures to capture climate change risks in their underwriting practices and the development of innovative insurance products.

Industry examples

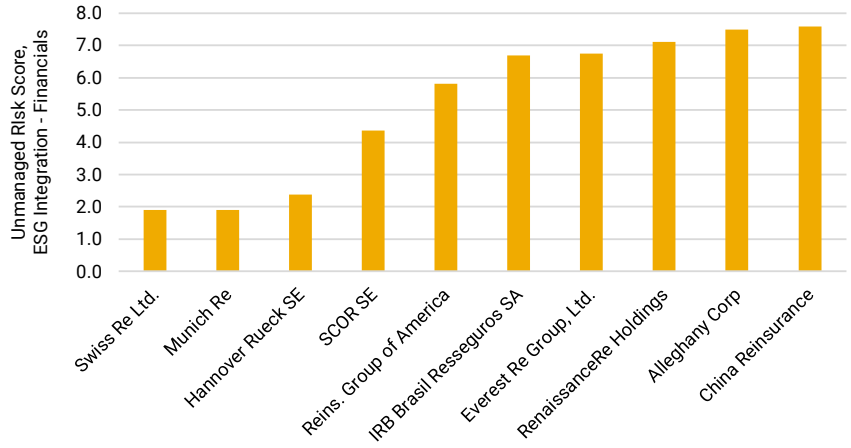
Localized risk information

For instance, Munich Re's NATHAN tool isolates location risk for flooding and storm surges down to individual postal codes. Meanwhile, Hanover Rueck committed USD 50mn in December 2019 to Germany's Natural Disaster Fund towards risk-transfer instruments for natural disaster and climate risks in developing markets. In addition, Swiss Re recently supported a parametric insurance solution with The Nature Conservancy and a Mexican state government to protect against hurricane damage on the Mesoamerican Barrier Reef System.[116]

Harnessing AI and machine learning

Considering the volatility of insurance payouts for natural catastrophe losses, we expect continued innovation to take place in climate-related insurance products. We anticipate more initiatives to integrate AI and machine learning along with human capabilities to improve climate modelling. Lastly, we forecast that reinsurers will continue to develop parametric insurance solutions that help to protect areas sensitive to natural disasters.[117]

Exhibit 34: Unmanaged Risk Score, ESG Integration – Financials



Source: Sustainalytics

Swiss Re Ltd.

Novel reinsurance products to help mitigate the impacts of natural disasters

20.2 **Overall Unmanaged Risk Score**
Medium Risk

3 out of 16 **Overall Unmanaged Risk Score, Subindustry Rank**
14th Percentile

1.9 **Unmanaged Risk Score, ESG Integration – Financials**
Negligible Risk

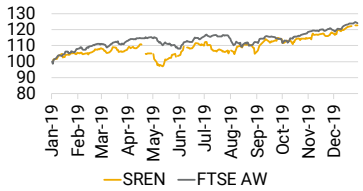
Country: Switzerland
Industry: Insurance
Subindustry: Reinsurance
Ticker: SREN (SWX)
Mkt cap (USD mn): 36,826*
**as of 31 December, 2019*

Key insights

- Swiss Re offers underwriting for coral reef systems to protect against hurricane damage, utilizing pre-determined severity thresholds.
- In 2018, the company developed a risk transfer product that protects solar farms financially in the event of reduced energy production.
- Swiss Re was among the first reinsurers to integrate ESG factors into its investment portfolio.

Overview

Stock price performance
SREN vs FTSE All-World, 2019*



*Indexed 2 Jan 2019. Source: **Bloomberg**

Swiss Re is a Zurich-based reinsurance company that provides underwriting for both the life and health, and the property and casualty segments. The company operates 80 offices in 30 countries and has over 9,000 employees. It is the largest reinsurer globally by gross premiums underwritten. Swiss Re has spearheaded efforts on tackling environmental and social challenges in its business by addressing natural disaster and climate risks, sustainable energy and longevity issues. In 2018, Swiss Re's combined natural disaster related claims amounted to USD 2.2bn, underscoring the importance of prudent climate risk mitigation and underwriting parameters to protect from losses.

Co-developing resilience bonds

Its contribution to improving climate change resilience include co-developing resilience bonds, which allow cities and utilities to invest in mitigation infrastructure while managing associated financial risks.[118] The company recently underwrote three offshore wind farm projects in Taiwan, helping to expand offshore wind power generation in Asia. Within its underwriting business, Swiss Re has pledged not to underwrite any businesses with more than 30% exposure to coal or mining operations. It also created the Swiss Re Institute in 2017, which conducts risk research to drive better decision making in the industry and regularly collaborates with inter-governmental agencies in the US, EU and Asia/Pacific on risk resilience.

Outlook – innovation key to managing growing risks

Lower probability of experiencing material ESG Integration risks in 2020

The current rate of climate change means bold action is needed to address the increasing number and intensity of natural disasters. Swiss Re's renewable energy underwriting, parametric insurance for areas vulnerable to natural disasters and resilience bonds present opportunities to improve the management of growing climate risks. Based on the considerations above and the company's low unmanaged risk score, Swiss Re appears well prepared to manage ESG integration issues in 2020.

Conclusion

Taking stock of 10 for 2020

Ten ESG-inspired investment themes

10 for 2020 marks the sixth instalment in Sustainalytics' *10 for* series. In this year's report we identified the following themes for investors to consider in their investment and engagement strategies:

- 5G
- Digitalization of mining
- Industrial automation
- Connected medical devices
- Slow fashion
- Cleaner shipping
- Banking on biodiversity
- Energy storage
- Big oil transition
- Reinsuring climate change

For each theme we described the underlying drivers, examined linkages to the SDGs and profiled a company that is particularly well-positioned.

Continuing the series

We hope that readers of *10 for 2020* find value in the report's discussion and analysis, and we look forward to contributing to Sustainalytics' flagship thought leadership report series again next year.

Endnotes

[1] The authors would like to thank and acknowledge several of their Sustainalytics colleagues for their contributions to this report. We would like to thank Megan Wallingford her thoughtful assistance in preparing the SDG sections of this report, as well as her overall comments on report content. We would also like to thank Hendrik Garz, Tytti Kaasinen, Kevin Ranney and Sarah Smith for their feedback and review. Finally, we would like to thank Alison Gray for her judicious proofreading and editing of 10 for 2020.

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[17] United Nations, Sustainable Development Goal 9, accessed (17.01.2020) at: https://sustainabledevelopment.un.org/sdg9; target summaries edited for space and targets with letter suffixes omitted.

[18] MEIs are one of the core building blocks in Sustainalytics' ESG Risk Ratings, which seek to measure the degree to which a company's economic value (enterprise value) is at risk driven by ESG factors or, more technically speaking, the magnitude of a company's unmanaged ESG risks. For more information, see https://www.sustainalytics.com/esg-ratings/.

[19] The Product Governance MEI assesses a company's performance with respect to product sustainability, quality and service – all of which are key given the complexities associated with a critical infrastructure rollout for 5G. The Human Capital MEI looks at a company's capabilities with respect to talent attraction and development and its approach to creating a diverse workforce. Both of these MEIs also track a firm's real-world performance on relevant controversies.

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