

Trucost
ESG Analysis

S&P Global

Sustainable Development Goals (SDGs)

Emerging Trends and Analysis of the SDG Impact
of Companies in the S&P 500®



Credits

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About Trucost, Part of S&P Global

Trucost is part of S&P Global. A leader in carbon and environmental data and risk analysis, Trucost assesses risks relating to climate change, natural resource constraints, and broader environmental, social, and governance (ESG) factors. Companies and financial institutions use Trucost intelligence to understand their ESG exposure to these factors, inform resilience, and identify transformative solutions for a more sustainable global economy. S&P Global's commitment to environmental analysis and product innovation enables its team to deliver essential ESG investment-related information to the global marketplace. For more information, visit www.trucost.com.

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Executive Summary

It has been four years since the 2030 Agenda for Sustainable Development with its 17 Sustainable Development Goals (SDGs) was adopted at the UN Sustainable Development Summit. During this time the SDGs have garnered widespread backing among companies and investors who have made modest progress towards aligning business strategies and capital allocation with the SDGs.

The private sector has begun to understand its role in contributing to the SDGs, as seen by increasing rates in corporate disclosure that describes company performance on the Goals. Investors have a growing appetite to benchmark companies against each other in terms of their SDG performance. Where disclosure is absent, other providers have built assessments, indexes and benchmarks to compare corporate action. Funding for SDG-related projects has also carried over to the private sector, as a rising number of pension funds and banks choose to allocate funds towards sustainable development priorities. While SDG-related financing is diverse, green building and renewable energy projects lead the bulk of private sector financing.

The SDGs are a way to communicate a company's efforts. Businesses can provide informed reporting to potentially attract capital allocation and unlock innovation opportunities. There is a divergence, however, in what SDGs companies report on and where companies have the highest exposure to SDG-related risk. An analysis of the baseline risk exposure of all companies listed in the S&P 500 shows that issues related to financial secrecy (SDG 17), land pollution and deforestation (SDG 15), and water overconsumption and pollution (SDG 6) have the highest level of exposure. These topline SDGs differ significantly from the most common SDGs that are included and prioritized in the majority of company disclosures. There is a difference in what companies disclose on the SDGs versus what may be important SDG-related risks and responsibilities.

Pursuing data-driven analysis to gain an understanding of the full impact of a business across its value chain – where it sources its materials and sells its products – can be useful in learning where to minimize risks and maximize both SDG and financial returns. A brief comparison of the compound annual growth rate (CAGR) of SDG-aligned products against conventional products shows the potential for pursuing innovation and market opportunities in line with the SDGs. Leveraging the SDGs as not only a framework for sustainable development, but also for innovation towards generating new, more future-ready revenue streams can help identify business opportunities that simultaneously serve the needs of the SDGs.

Introduction and Context

It has been four years since the 2030 Agenda for Sustainable Development with its 17 Sustainable Development Goals (SDGs) was adopted at the UN Sustainable Development Summit. During this time, the SDGs have garnered widespread backing among companies and investors who have made modest progress towards aligning business strategies and capital allocation with the SDGs. While challenges prevail in transitioning to transformative action on the SDGs, several trends have emerged that suggest this action is accelerating.

Growing Corporate Disclosure on SDG Alignment

Several global surveys have showcased the increased attention companies are giving to public reporting in line with the SDG framework. In 2018, KPMG analysis showed that 40% of the world's 250 largest companies discuss SDGs in their reporting,¹ while a 2019 report by Oxfam, *Walk the Talk*, found 62% of companies in an analyzed sample have made a public commitment to the SDGs.² Better yet, a 2019 survey by World Business Council for Sustainable Development (WBCSD) and DNV GL found that among the 250 global companies surveyed, 82% have reported on the SDGs.³ A minority of companies report on all 17 SDGs; most prioritize a select few.

¹ *How to Report on the SDGs: What Good Looks like and Why It Matters*. KPMG, Feb. 2018, assets.kpmg/content/dam/kpmg/xx/pdf/2018/02/how-to-report-on-sdgs.pdf.

² *Walking the Talk: Assessing Companies' Progress from SDG Rhetoric to Action*. Oxfam , Sept. 2018, oxfamlibrary.openrepository.com/bitstream/handle/10546/620550/dp-walking-the-talk-business-sdgs-240918-en.pdf.

³ *Business and the SDGs: A Survey of WBCSD Members and Global Network Partners*. WBCSD and DNV GL, July 2018, docs.wbcsd.org/2018/07/WBCSD_Business_and_the_SDGs.pdf.

Table 1: Most and least prioritized SDGs as highlighted in 2018-2019 surveys⁴

	Business and the SDGs	Evaluating Progress on the SDGs	Walking the Talk	How to Report on the SDGs
	WBCSD & DNV GL	GlobeScan – SustainAbility	Oxfam	KPMG
Most Prioritized	SDG 13 SDG 12 SDG 8	SDG 13 SDG 12 SDG 15	SDG 8 SDG 13 SDG 3 SDG 12	SDG 13 SDG 8 SDG 3
Least Prioritized	SDG 15 SDG 1 SDG 10	SDG 9 SDG 17 SDG 5	SDG 14 SDG 15 SDG 10	SDG 15 SDG 2 SDG 14

Sources: Trucost analysis 2019, color-coding aligns with SDG icons created by the United Nations (2015). WBCSD & DNV GL 2019, GlobeScan-SustainAbility 2019, Oxfam 2019, KPMG 2018

Movement Towards Ranking of Company SDG Performance

Investors have a growing appetite to benchmark companies against each other in terms of their SDG performance. Where disclosure is absent, other providers have built assessments, indexes and benchmarks to compare corporate action. Information providers increasingly offer investor-focused products for measuring a company's portfolio towards the SDGs, while indexes have emerged to help investors gain exposure to companies identified as making a contribution to the Goals. The World Benchmarking Alliance has accelerated work in this arena by planning to build science-informed league tables, starting first with a Food and Agriculture Benchmark comprising 300 companies across the food and agricultural value chain.⁵

Increased Capital Allocation for SDG-Related Projects

Funding for SDG-related projects has carried over into the private sector as an increasing number of pension funds and banks choose to allocate funds towards sustainable development priorities. The funding gap in financing to achieve the SDGs is estimated to be \$2-3 trillion per year, with the private sector expected to contribute \$1-1.5 trillion.⁶

Several pension funds, linking the need for long-term performance with constituents' values, have increased allocations to SDG investments, including the Danish SDG Investment Fund (\$752 billion)

⁴ SDG 1: No Poverty, SDG 2: Zero Hunger, SDG 3: Good Health and Well-Being, SDG 4: Quality Education, SDG 5: Gender Equality, SDG 6: Clean Water and Sanitation, SDG 7: Affordable and Clean Energy, SDG 8: Decent Work and Economic Growth, SDG 9: Industry, Innovation and Infrastructure, SDG 10: Reduced Inequalities, SDG 11: Sustainable Cities and Communities, SDG 12: Responsible Consumption and Production, SDG 13: Climate Action, SDG 14: Life Below Water, SDG 15: Life on Land, SDG 16: Peace, Justice and Strong Institutions, SDG 17: Partnerships for the Goals

⁵ "Food and Agriculture Benchmark: Draft Industry and Company Scope." *Food and Agriculture Benchmark*, World Benchmarking Alliance, June 2019, www.worldbenchmarkingalliance.org/wp-content/uploads/2019/06/WBA-Food-and-Agriculture-Benchmark-scoping.pdf.

⁶ "Report: Better Business, Better World." *Better Business, Better World*, Business & Sustainable Development Commission (BSDC), Jan. 2017, report.businesscommission.org/report.

and ABP (\$68 billion by 2020); Australia's Cbus Super Fund and CalPERS have announced plans to align investment strategies with the SDGs.

Starting in 2017, the World Bank issued bonds (US\$23.5 billion) managed by BNP Paribas that directly link to the performance of companies advancing SDG priorities. HSBC made headways in late 2018 when it issued its first SDG bond for \$1 billion, allocating proceeds towards green building, social housing, renewable energy and other sustainability categories. In the first half of 2019, \$10.3 billion in SDG bonds and \$5.5 billion in social bonds were issued, with 50% of volumes comprising financial and non-financial corporates.⁷

In October of 2019, thirty CEOs of large companies around the world launched the Global Investors for Sustainable Development Alliance (GISD) at the UN General Assembly with the intention of implementing an investment plan for sustainable development over the next two years.⁸

Renewable Energy and Buildings Projects Receive the Most Attention

While SDG-related financing is diverse, green building and renewable energy projects lead the bulk of investment among financing by the private sector. Two of the largest allocations of the HSBC SDG Bond are for green building (38%) and renewable energy (18%), while the Danish SDG Investment Fund intends to invest in a number of sectors, including sustainable energy and infrastructure. Green bonds, majorly allocated towards renewable energy and green construction, are steadily increasing with over \$100 billion issued in the first half of 2019.⁹

⁷ *Green Bonds Market Summary H1 2019*. Climate Bonds Initiative, July 2019, www.climatebonds.net/files/files/H1%202019%20Highlights_final.pdf.

⁸ “30 Business Titans Join UN Push to Scale Up Private Sector Investment for Sustainable Development.” *United Nations Sustainable Development Goals*, 2019, <https://www.un.org/sustainabledevelopment/blog/2019/10/gisd-alliance/>

⁹ *Green Bonds Market Summary H1 2019*. Climate Bonds Initiative, July 2019, www.climatebonds.net/files/files/H1%202019%20Highlights_final.pdf.

Analysis: SDG Impact of the S&P 500

Measuring SDG implementation is specific to geography and also to industry, as different countries are at varying stages of SDG attainment, and industries vary in how their activities affect their area of operation. In addition to the industry a business operates in, there is also the geographic distribution of its value chain – where it sources its materials and sells its products – that will have its own impact on a broad range of issues related to the SDGs.

Modeling can assist in filling gaps when there is lack of data or detailed information on the range of SDG issues that may occur within a business's value chain. Accordingly, Trucost developed an input-output model approach to evaluate the baseline exposure of a company to each SDG. Trucost's SDG-Extended Multiregional Input-Output Model (SDGI-O) models economic flows and associated exposure to SDG-related risks across countries and sectors globally. Trucost considers SDG risk as the risk that a company may be directly or indirectly causing a negative impact on the SDGs (such as greenhouse gas emissions in the supply chain) or the risk that a company may be dependent on practices and activities that conflict with the SDGs (such as underpayment of wages or child labor). The SDGI-O model contains 45 metrics based off the 169 SDG targets that are then aggregated on the Goal level. These metrics were selected due to their direct application to the private sector and adequate data availability.

Using this approach, Trucost underwent an analysis of the baseline risk of all companies listed on the S&P 500.¹⁰ This evaluation does not take into account company-specific actions to mitigate risks, but rather captures a level of baseline risk directly related to private sector activities when operating in specific industries and countries. The methodology, assumptions and limitations of the analysis are included in the Technical Appendix on page 17.

Figure 1: SDG exposure of all companies listed in the S&P 500

SDG Exposure is normalized from 0-1 with 0 being lowest risk (dark green) and 1 being the highest (red)

SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
0.09	0.00	0.19	0.06	0.07	0.47	0.03	0.34	0.38	0.08	0.10	0.39	0.44	0.37	0.56	0.06	1.00

Source: Trucost. Data as of June 28, 2019.

¹⁰ S&P 500 data for end of June, accessed on June 28th, 2019

Largest SDG Exposure for S&P 500 Companies

Figure 1 refers to the total SDG exposure for all companies listed on the S&P 500 across all operating geographies and value chain stages, which includes all suppliers (direct and indirect), operations and downstream impacts. SDG 17: Partnership for the Goals notably has the highest risk for these companies. SDG 17 target 17.1 calls for countries to strengthen their capacity for domestic tax collection to finance actions to address the SDGs, an effort that can be hindered by opaque corporate tax policies. The underlying metric in the SDGI-O model linked to SDG 17 with the highest SDG Exposure is Fair Share Taxation, which takes into account the level of financial secrecy and scale of offshore financial activities by country. This metric is also only counted in the operations value chain stage since it is directly within a company's operational control and does not relate to a company's suppliers or customers.

In the 2018 Secrecy Ranking in the Financial Secrecy Index¹¹ the U.S. ranked as number two in secrecy, only behind Switzerland. Given that the S&P 500 must contain common stocks of only U.S. companies, this metric has a high risk exposure. Corporations can take steps to ensure that tax policies are transparent, provisions are made for whistle-blowers to highlight unethical practices, and information on the effective tax rates paid across a corporation's operations are disclosed, including any tax concessions granted to the business.¹²

Figure 2: SDG exposure of all companies listed in the S&P 500 by value chain stage

SDG Exposure is normalized from 0-1 with 0 being lowest risk (dark green) and 1 being the highest (red)

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
All	0.09	0.00	0.19	0.06	0.07	0.47	0.03	0.34	0.38	0.08	0.10	0.39	0.44	0.37	0.56	0.06	1.00
Operations	0.14	0.00	0.23	0.11	0.09	0.45	0.03	0.42	0.53	0.11	0.12	0.45	0.60	0.34	0.49	0.04	1.00
Tier 1 Suppliers	0.04	0.00	0.27	0.05	0.02	0.77	0.05	0.39	0.31	0.02	0.15	0.64	0.46	0.65	1.00	0.01	NA

Source: Trucost. Data as of June 28, 2019.

Other SDGs with high SDG exposure include SDG 15: Life on Land, SDG 6: Clean Water and Sanitation, and SDG 13: Climate Action. When broken out by operations and Tier 1 suppliers, the analysis reveals how these SDGs have higher exposures at different stages of the value chain. Tier 1 suppliers, or a supplier that provides products and services directly to a company without the involvement of other suppliers, has the highest exposure related to SDG 15: Life on Land. This

¹¹ The Fair Share Taxation metric is based off the Financial Secrecy Index by Tax Justice Network – “Financial Secrecy Index.” Tax Justice Network, 2019, www.financialsecrecyindex.com/en/.

¹² Per UNPRI recommendations for investor assessments of corporate tax transparency – *Evaluating and Engaging on Corporate Tax Transparency: An Investor Guide*. Principles for Responsible Investment, *Evaluating and Engaging on Corporate Tax Transparency: An Investor Guide*, www.unpri.org/download?ac=4668.

exposure is driven by the level of land pollution and deforestation related to Tier 1 sectors operating in their respective geographies.

Water availability is a growing concern among corporations as water scarcity rates increase. Recent research by the World Resources Institute¹³ reveals that 17 countries are close to running out of water due to existing arid conditions, non-efficient usage or relying too heavily on groundwater, which can take decades to replenish.¹⁴ Companies in the S&P 500 have a high exposure to SDG 6: Clean Water and Sanitation, particularly within the supply chain. With over half of the world's companies' water use stemming from their supply chains,¹⁵ tackling water consumption, pollution and access to clean water will require companies to extend solutions across their value chains.

Companies are increasing their efforts to lower greenhouse gas (GHG) emissions, but GHG emissions intensity is still high for many countries where the S&P 500 companies conduct business activity. The exposure for SDG 13: Climate Action will likely increase as these companies may experience growing vulnerability to climate-related issues such as extreme weather events, sea level rise and carbon taxes.

SDGs where the S&P 500 has the lowest SDG exposure are SDGs 2: No Hunger and 7: Affordable and Clean Energy. Given the ubiquity of U.S. companies on the S&P 500 with a large proportion of operations and likely Tier 1 suppliers located in developed countries, these SDGs emerge with a lower exposure. Using the U.S. as an example, while challenges remain related to adult obesity (U.S. has current rate of 36.2% prevalence),¹⁶ the U.S. is close to achieving SDG 2: No Hunger in terms of undernourishment. With SDG 7: Affordable and Clean Energy, 100% of the U.S. population has access to electricity and clean fuels; however, exposure relating to energy consumption levels and access to renewable energy (only 8.7% renewable energy in final consumption)¹⁶ is higher and increases this overall SDG exposure value.

¹³ "RELEASE: Updated Global Water Risk Atlas Reveals Top Water-Stressed Countries and States." *World Resources Institute*, 12 Aug. 2019, www.wri.org/news/2019/08/release-updated-global-water-risk-atlas-reveals-top-water-stressed-countries-and-states.

¹⁴ Gleeson, Tom, et al. *The Global Volume and Distribution of Modern Groundwater*. *Nature Geoscience*, 16 Nov. 2015, www.nature.com/articles/ngeo2590.

¹⁵ *The 2019 State of Green Business Report*. GreenBiz, 2019, *The 2019 State of Green Business Report*, www.greenbiz.com/report/2019-state-green-business-report.

¹⁶ "USA." *Sustainable Development Report Dashboards* 2019, 2019, dashboards.sdgindex.org/#/USA.

Largest Exposure for Select Sectors

Select sectors, including Metals and Mining, Technology and Media and Real Estate, were investigated to explore the differences of SDG Exposure by industry. While SDG 17 is still high among all sectors, Metals & Mining contains the highest relative exposure associated with SDGs 15: Life on Land, 6: Clean Water and Sanitation, and 14: Life Below Water.

Real Estate and Media and Technology also have exposure related to these SDGs, likely related to construction activities and the manufacturing of technology hardware, but their exposure is considerably lower than that of Mining and Metals. Notably, Media and Technology appears to have a higher exposure related to SDG 5: Gender Equality, potentially highlighting a larger presence of gender pay gaps for companies within this sector (figure 3).

Figure 3: SDG exposure of all companies and select sectors in the S&P 500

SDG Exposure is normalized from 0-1 with 0 being lowest risk (dark green) and 1 being the highest (red)

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
S&P 500	0.07	0.01	0.15	0.05	0.06	0.34	0.03	0.25	0.28	0.06	0.08	0.29	0.32	0.28	0.41	0.05	0.73
Metals & Mining	0.00	0.01	0.32	0.01	0.00	0.93	0.06	0.08	0.19	0.00	0.10	0.43	0.42	0.81	1.00	0.03	0.73
Real Estate	0.01	0.01	0.08	0.01	0.00	0.16	0.06	0.00	0.22	0.00	0.01	0.23	0.22	0.16	0.24	0.03	0.73
Media & Technology	0.13	0.05	0.11	0.02	0.13	0.31	0.07	0.08	0.24	0.14	0.05	0.24	0.27	0.22	0.37	0.06	0.73

Source: Trucost. Data as of June 28, 2019.

The value chain view of SDG exposure for Mining & Metals companies shows less variation among value chain stages, which reflects the intensive activity of the industry in both operations and among Tier 1 suppliers (figure 4).

Figure 4: SDG exposure of all Metals & Mining companies in the S&P 500

SDG Exposure is normalized from 0-1 with 0 being lowest risk (dark green) and 1 being the highest (red)

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
All Operations	0.00	0.01	0.32	0.01	0.00	0.93	0.06	0.08	0.19	0.00	0.10	0.43	0.42	0.81	1.00	0.03	0.73
Tier 1 Suppliers	0.01	0.03	0.34	0.02	0.00	0.95	0.07	0.03	0.19	0.00	0.12	0.43	0.43	0.84	1.00	0.02	0.48

Source: Trucost. Data as of June 28, 2019.

Meanwhile, Real Estate and Technology have larger exposures of particular SDGs (6: Clean Water and Sanitation, 12: Responsible Consumption and Production, 14: Life Below Water, 15: Life on Land)

among their Tier 1 suppliers than in operations, suggesting intensive activities such as manufacturing and extraction predominantly occur in the supply chain (figures 5 and 6).

Figure 5: SDG exposure of all Real Estate companies in the S&P 500

SDG Exposure is normalized from 0-1 with 0 being lowest risk (dark green) and 1 being the highest (red)

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
All	0.01	0.02	0.11	0.01	0.00	0.22	0.08	0.00	0.30	0.00	0.01	0.31	0.29	0.22	0.33	0.04	1.00
Operations	0.08	0.12	0.19	0.11	0.05	0.04	0.19	0.00	0.53	0.06	0.07	0.44	0.42	0.12	0.08	0.09	1.00
Tier 1 Suppliers	0.01	0.03	0.22	0.03	0.00	0.75	0.10	0.07	0.28	0.00	0.08	0.57	0.41	0.62	1.00	0.01	NA

Source: Trucost. Data as of June 28, 2019.

Figure 6: SDG exposure of all Technology and Media companies in the S&P 500

SDG Exposure is normalized from 0-1 with 0 being lowest risk (dark green) and 1 being the highest (red)

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
All	0.16	0.04	0.12	0.00	0.16	0.40	0.07	0.09	0.30	0.17	0.05	0.31	0.35	0.29	0.50	0.06	1.00
Operations	0.37	0.09	0.12	0.00	0.31	0.40	0.08	0.15	0.42	0.34	0.03	0.34	0.46	0.22	0.43	0.05	1.00
Tier 1 Suppliers	0.02	0.06	0.26	0.04	0.00	0.73	0.11	0.08	0.30	0.00	0.15	0.63	0.46	0.61	1.00	0.01	NA

Source: Trucost. Data as of June 28, 2019.

Differences in Companies' Reporting and their Greatest SDG Exposure

Interest in reporting on the SDGs has been rising in recent years;¹⁷ however, challenges remain in utilizing information on the SDGs in business and investment decisions. Most companies do not address all SDGs in their reporting, often choosing to prioritize effort on the SDGs that are most relevant to their business or disclose only on the positive impacts they contribute to the SDGs. The Trucost SDGI-O model provides a data-driven, quantitative estimation of which SDGs may need the most prioritization from companies and where along the value chain this exposure is most prevalent.

When comparing the top SDGs reported from companies, based on surveys in the past two years and with results from analysis of SDG exposure of the S&P 500, the strongest divergence is with SDG 17: Partnership for the Goals. While often the least reported within company disclosure, the analysis of the S&P 500 found this SDG to have the highest exposure due to the level of financial secrecy and lack of fair share taxation in the geographies where these companies conduct business. Companies may also not regularly associate SDG 17 with issues related to taxation.

Table 2: Comparison of top four SDGs in company reporting vs. SDG exposure captured by the SDGI-O model

MOST REPORTED	MOST SDG EXPOSURE
 3 GOOD HEALTH AND WELL-BEING  8 DECENT WORK AND ECONOMIC GROWTH  12 RESPONSIBLE CONSUMPTION AND PRODUCTION  13 CLIMATE ACTION	 6 CLEAN WATER AND SANITATION  13 CLIMATE ACTION  15 LIFE ON LAND  17 PARTNERSHIPS FOR THE GOALS

Sources: Most reported: WBCSD & DNV GL 2019, GlobeScan-SustainAbility 2019, Oxfam 2019, KPMG 2018; Most SDG Exposure: Trucost. Data as of June 2019.

¹⁷ The Road Ahead: The KPMG Survey of Corporate Responsibility Reporting 2017. 2017, The Road Ahead: The KPMG Survey of Corporate Responsibility Reporting 2017, assets.kpmg/content/dam/kpmg/xx/pdf/2017/10/kpmg-survey-of-corporate-responsibility-reporting-2017.pdf.

Another divergence is the lack of SDG 8: Decent Work and Economic Growth as a high SDG exposure in the S&P 500. The indicators underlying this SDG in the SDGI-O model are important aspects of business operations, including upholding strong labor rights, enabling freedom of association, avoiding the use of forced labor and limiting workplace accidents. Many of the companies listed have likely implemented effective policies and procedures to limit exposure to these types of risks, in addition to operating in areas with lower exposure to these risks.

An alignment in company reporting and the S&P 500 analysis is the prioritization of SDG 13: Climate Action. Companies are increasingly disclosing data, with more than 2,500 companies worldwide providing climate change responses, a 31% increase from 2017 and a 70% increase in the APAC region alone.¹⁸ Continued action to significantly limit emissions and increase resiliency of business operations will be important in order to lower current temperature trajectories of 4°C of warming above pre-industrial levels¹⁹ to a safer, but still challenging, 2°C by 2050.

According to the S&P 500 analysis, SDG 15: Life on Land has a greater SDG exposure than those SDGs related to climate, water or unethical labor practices, but is often the least reported on by companies. Issues related to biodiversity, natural land loss and deforestation are accelerating at unprecedented rates. A recent IPBES report stated that over 1 million of the world's 8 million species are currently threatened with extinction due to changes in land and sea use by humans, direct exploitation, climate change, pollution and the spread of invasive species.²⁰ The report also states that the SDGs cannot be met by current trajectories and these negative trends will undermine progress towards 80% of the other SDGs, including those related to poverty, hunger, health, water, cities and climate. Decreasing pollution, avoiding deforestation and remediating and reforesting altered land may become an additional imperative for the private sector.

¹⁸ "Best Practices in Corporate Climate Disclosure: How the Leaders Are Leading." Trucost, www.trucost.com/publication/best-practices-in-corporate-climate-disclosure-how-the-leaders-are-leading/.

¹⁹ According to IEA WEO New Policies Scenario, which incorporates all current policies and measures that governments have put in place, including the likely effects of announced policies related to the National Determined Contributions (NDCs) made for the Paris Agreement. These current and intended policies, however, are not enough to limit global temperature rise below 2°C. Human-induced warming reached 1°C in 2017.

²⁰ "UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating' - United Nations Sustainable Development." United Nations, United Nations, www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/.

SDG-Aligned Products: Route for Business Growth

It is useful for companies to be aware of the risks across their operations and value chains that relate to the SDGs. By identifying these risks, business can prioritize action, mitigate these risks and benchmark performance over time. Companies can also contribute to the SDGs through the sale of SDG-aligned products and services.²¹

Table 3: SDG-Aligned products and associated SDGs

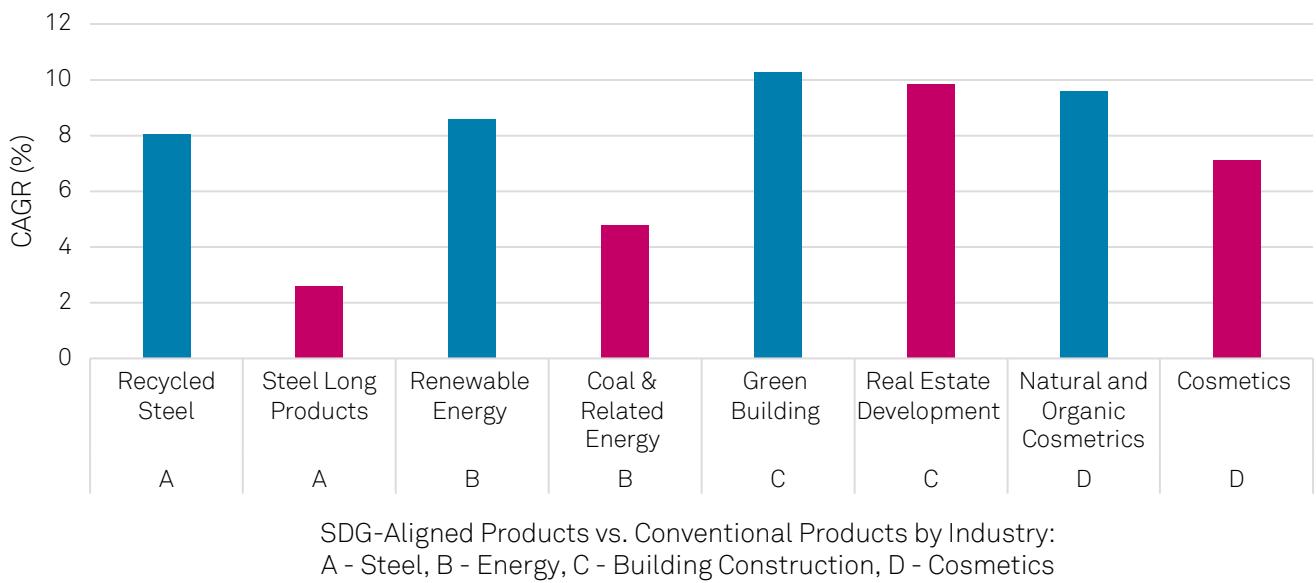
	SDGs
Recycled Steel	8 9 12
Renewable Energy	7 13
Green Building	7 8 9 11 12
Natural & Organic Cosmetics	3

Source: Trucost Positive Impact database 2019.

There may be business opportunities by serving the needs of the SDGs. Analysis from a cohort of 13 companies who underwent a Trucost SDG Evaluation revealed these participants were already capturing over \$232.98 billion in revenue, or 87% of overall revenue, from SDG-aligned products, services and technologies. Growth in green and sustainability-oriented products has risen steadily in past years and is projected to continue. While companies can aim to mitigate the majority of their impact, ultimately businesses need to generate revenue streams that contribute to sustainable outcomes.

A brief comparison of the compound annual growth rates (CAGR) of SDG-aligned products versus conventional products in the same industry shows the potential for pursuing innovation and market opportunities in line with the SDGs.

²¹ As part of Trucost SDG Evaluation Tool – a standardized and data-driven approach to the assessment of corporate performance on the SDGs – Trucost developed a database on a bottom-up review of the 169 SDG targets to identify categories of products, services and technologies that directly contribute to the achievement of each target.

Figure 7: Comparison of CAGR of SDG-aligned (blue) vs. conventional products (red)

Sources: Trucost analysis 2109. A: World Steel Association 2017 – timeline 2018–2023; B: DBS 2018 – timeline 2010–2018; C: Market Research Future 2019 – timeline 2018–2023, NYU Stern 2019 – timeline 2016–2018; D: Market Research Future 2019 – timeline 2018–2030, Reuters 2018 – timeline 2018–2023

Conclusion

The SDGs were launched as a blueprint for a more just, sustainable and prosperous future. The private sector has begun to understand its role in contributing to their attainment, as seen by increasing rates in corporate disclosure on the SDGs. Investors are also increasingly interested in benchmarking the performance of companies on the SDGs, and different mechanisms to compare and rank companies are emerging in the form of indexes, benchmarks and, in the case of the World Benchmarking Alliance, league tables.

Capital allocation in line with SDG priorities is also on the rise with the emergence of SDG Bond issuances by major banks and institutions and pension funds proactively allocating funds towards sustainable development prerogatives. The SDGs are a way to communicate a company's efforts and businesses can provide informed reporting to potentially attract capital allocation and unlock innovation opportunities.

There is a divergence, however, in what SDGs report on and deem the highest priority versus those SDGs where companies have the highest exposure. An analysis of the baseline risk exposure of companies listed on the S&P 500 shows that issues related to financial secrecy (SDG 17), land pollution and deforestation (SDG 15) and water overconsumption and pollution (SDG 6) have the highest level of exposure. These topline SDGs differ significantly from the most common SDGs that are included and prioritized in current company disclosures. There is a difference in what companies disclose on the SDGs versus what may be important SDG-related risks and responsibilities.

Pursuing data-driven analysis for understanding the full impact of a business across its value chain can be useful in understanding where to minimize risks and maximize both SDG and financial returns. Leveraging the SDGs as not only a framework for sustainable development but also for innovation towards generating new, more future-ready revenue streams can help identify business opportunities that simultaneously serve the needs of the SDGs.

Appendix: Technical Methodology

The SDGs encompass a broad range of environmental, social and governance issues that may be of greater or lesser relevance to any given company based on the nature of their operations and business model, and the different countries in which they operate, source materials and sell their products. For example, the issue of air, land and water pollution may be highly material to the heavy industrial and energy sectors, but less to professional services or retail. Similarly, issues of corruption and bribery, child labor and unsafe working conditions vary in prevalence across the world. Given this, it is possible to assess a company's exposure to each SDG based on the sectors in which it operates in, and the geographic distribution of its value chain. Few companies disclose, or even have access to, detailed information on their impacts on the broad range of issues represented by the SDGs across their full value chain, and so Trucost developed a model based approach to evaluate the baseline exposure of a company to each SDG. In the context of the SDG Evaluation, 'SDG exposure' refers to the risk that a company may be directly or indirectly causing a negative impact on the SDGs (such as environmental pollution emissions in the supply chain) or the risk that a company may be dependent on practices and activities that conflict with the SDGs (such as underpayment of wages or child labor). SDG exposure is assessed using Trucost's 'SDG-Extended Multiregional Input-Output Model (SDGI-O)' that models economic flows and associated SDG risks across countries and sectors globally. The SDGI-O comprises two key components:

- A multi-regional input output table. Trucost used the EORA26 multi-regional input-output table (Lenzen et al, 2012),²² which documents financial flows between 26 sectors and 190 countries in the global economy.
- A set of SDG metrics and satellite accounts to enable the modelling of SDG exposure based on financial flows within companies and sectors.

These components, and their application in the SDG Evaluation analysis, are described in the following sections.

Multi-Regional Input-Output Model

Input-output models provide a simple and robust method for the evaluation of the linkages between economic activities in one sector and/or country, and those of all other sectors and countries in the economy. Thus input-output models describe the financial flows within the economy as the outputs of one sector are used as inputs to another sector. Input-output models may be extended with a set of satellite accounts describing environmental or social resource consumption or emissions associated with activities in each sector, allowing the estimation of the environmental and social impacts associated with complex cross-sectoral and international supply chains. Trucost converted the EORA26 input-output table to an input-output model describing the direct and indirect supply chain of each sector and country combination in the model. The model was inverted to approximate

²² Lenzen, M., Kanemoto, K., Moran, D., and Geschke, A., 2012, *Mapping the structure of the world economy*, Environmental Science & Technology, 45(15), pp. 8374-8381. DOI: 10.1021/es300171x.

the downstream markets in which the outputs of each sector and country are consumed. In combination, the input-output model represents the full value chain of a company based on its operating sector and locations, and the end markets for its products and services.

SDG Metrics and SDGI-O Extensions

The Trucost SDGI-O model includes a set of 45 extensions describing the impacts or dependency of each sector in each country on a series of environmental, social and governance issues linked to the SDGs. The metric set was identified based on a detailed bottom-up review of the 169 targets that make up the 17 SDGs, with a view to selecting a series of metrics that are:

- Representative of corporate exposure to an SDG target through a plausible impact or dependency pathway. For example, impacts on greenhouse gas emissions via the use of fossil fuels, or dependency on unsafe working conditions via the indirect workforce in a company's supply chain.
- Amenable to geographic and sector specific exposure modelling with appropriate modelling techniques and data sets available. Complete monitoring and disclosure of information on the full range of issues underlying the SDGs for company operations is rare, and rarer still for the full value chain given the complexities inherent in gathering this data. Consequently, the selection of a set of metrics that can be reliably modelled for all companies, regardless of the quality of their disclosure, was critical.

For a full list of metrics used in the SDGI-O model, please see the Technical Appendix of Trucost's previous publication "Discovering Business Value in the United Nations Sustainable Development Goals (SDGs)."²³ This publication describes the 45 metrics included in the SDG Exposure Assessment Model, including the metric definition, estimation approach, data sources and linked SDGs.

²³ "Discovering Business Value in the United Nations Sustainable Development Goals (SDGs)." Trucost, www.trucost.com/publication/discovering-business-value-in-the-united-nations-sustainable-development-goals-sdgs/.

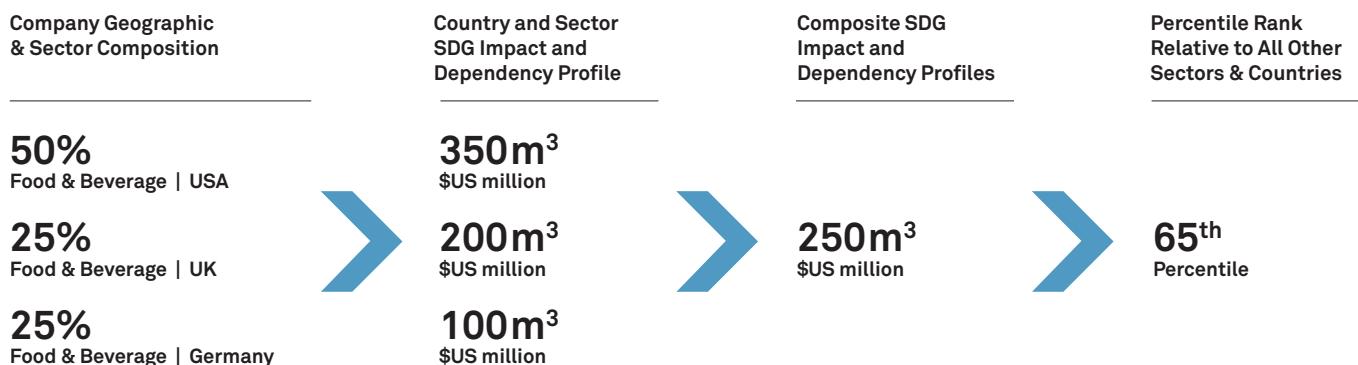
While the majority of metrics apply to all sectors, a small selection are limited to one or more sectors including:

- Metric 5: Agricultural Practices (Food and Beverage, Agriculture and Fishing sectors)
- Metric 15: Energy Access (Electricity, Gas and Water sector)
- Metric 24: Sustainable Tourism (Hotels and Restaurants sector)
- Metric 25: Financial Services Access (Financial Intermediation and Business Activities sector)
- Metric 37: Overfishing (Fishing sector)

Company Exposure Assessment

The combination of the multi-regional input-output model and the SDG metric extensions forms the SDGI-O, which enables the modelling of company impacts and dependencies on each of the 45 SDG metrics across four stages of the value chain: Direct operations, direct suppliers, indirect suppliers and downstream or product use and disposal. The SDGI-O model is used to develop impact and dependency profiles for each country and sector combination (e.g. Retail Trade in the USA, Food and Beverage in Egypt) in the model, at each stage of the value chain. These profiles are then combined to reflect the sectoral and geographic composition of a given company to produce a company specific SDG exposure profile.

Figure 1: SDG Exposure Analysis Example: Water Consumption Metric for XYZ Company Operations



Source: Trucost analysis. Data for illustrative purposes only

Since each metric in the SDGI-O is quantified in its own unique units – cubic meters for the ‘Water Consumption’ metric or employees at risk of underpayment for the ‘Fair Wages’ metric – it is necessary to design an approach to compare the relative level of exposure to each metric given a company’s particular sectoral and geographic composition. As shown in Figure 1, the composite SDG impact and dependency profiles for a given company are compared with that of all other countries and sectors in the SDGI-O to rank the relative level of exposure for the company to each metric, relative to the global economy. This allows for the comparison of the relative magnitude of exposure

of a company to each metric. This process is repeated for the four stages of the value chain to produce an average exposure profile for the company at the metric level, and aggregated to the SDG level based on the metrics linked to each SDG.

Limitations

The scope of this analysis necessitates a range of simplifying assumptions and methodological choices which present some limitations that must be considered when interpreting the results.

- **Sector and Geographic Granularity.** The EORA26 input-output tables selected as the basis for the Trucost SDGEI-O offers the most extensive geographic coverage available in the market, but is limited to 26 unique sectors within each geography. As such, in many cases the social and environmental extensions included in the model represent averages for a range of sub-sectors contained within each high-level sector.
- **Environmental, Social and Governance Data Availability.** Availability of detailed country and sector specific information on the broad range of environmental, social and governance issues represented by the SDGs is variable. While extensive and detailed datasets are available on the environmental performance across countries and sectors (such as those developed by Trucost), datasets focusing on environmental and social issues are more limited. As such, the Trucost SDGEI-O incorporates a mix of country and sector specific datasets where available. The data sources used in the calculation of each SDG metric are described in the Appendix.
- **Metric Selection.** In designing the SDGI-O, Trucost has sought to select a set of metrics that are broadly representative of the issues underlying the SDGs, with a focus on metrics that are amenable to modelling and representative of company exposure to a given issue through a plausible impact pathway. Due to data constraints, it was not possible to design metrics linked to all 169 of the SDG targets, many of which are not quantitative or primarily directed to governments.

About Trucost

Trucost is part of S&P Global. A leader in carbon and environmental data and risk analysis, Trucost assesses risks relating to climate change, natural resource constraints, and broader environmental, social, and governance factors.

Companies and financial institutions use Trucost intelligence to understand their ESG exposure to these factors, inform resilience and identify transformative solutions for a more sustainable global economy. S&P Global's commitment to environmental analysis and product innovation allows us to deliver essential ESG investment-related information to the global marketplace. For more information, visit www.trucost.com.

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