

Technology

ESG Evaluation Key Sustainability Factors

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Approach

Our key sustainability factors (KSF) identify the most material environmental and social risks assessed in our ESG Evaluation. We assess the materiality¹ of those risks across the industry's value chain and reflect them in the weighting of our environmental and social factors. We also provide the quantitative indicators² used to assess a company's performance relative to its industry peers on each of those factors. For further information, please refer to our ["Environmental, Social, And Governance Evaluation: Analytical Approach."](#)

Scope

This KSF covers a wide variety of companies in the technology sector, globally, including the Software and Services, Hardware, and Semiconductor industries. These industries produce handheld devices, semiconductor chips, and software, as well as offer internet-based services.

Material Environmental Risks

Technology companies are exposed to material environmental risks across their value chain:

- **Environmental impacts associated with product manufacturing, distribution, and use for hardware & semiconductors, as well as energy use for software companies:** these activities may result in significant water consumption, pollution, and energy use, especially for hardware and semiconductor manufacturing. Greenhouse gas (GHG) emissions and energy use in direct operations are most relevant for software and services companies. New regulations or customer demand may drive companies to develop energy-efficient products and processes.
- **Waste management:** electronic, plastic, and chemical waste associated with the end of life of technology hardware may drive new and stricter regulation.
- **Environmental impact in the upstream supply chain:** the sector sources its raw materials from extensive supply chains across the mining, chemicals, and oil and gas industries, which can have significant land, water, emissions, and pollution implications. If improperly managed, upstream supply chain risks could have substantial reputational impacts on companies' direct operations.

Environmental Factors: Weighting and KPIs

Our weighting of environmental factors varies by sub-sector, and we use different quantitative performance indicators to inform our opinion of an entity's management of environmental impacts. Our ESG evaluation opinions are also informed by qualitative indicators such as an entity's climate-change-related policies and commitments.

Factor	Hardware	Semiconductors	Software and IT services
 Greenhouse gas emissions	35%	35%	70%
 Waste and pollution	35%	25%	10%
 Water	20%	30%	10%
 Land use and biodiversity	10%	10%	10%

Hardware

The higher weighting on GHG emissions and waste and pollution reflects exposure to regulatory and reputational risks arising from high GHG emissions, energy use, and waste generation in manufacturing and supply chain activities, including product end-of-life. Hardware manufacturing is not typically water intensive and land use impacts are relatively minor.

Factor	Weight	Key performance indicators	Other performance indicators
 Greenhouse gas emissions	35%	<ul style="list-style-type: none"> – Scope 1 emissions intensity (tons of carbon dioxide equivalent [tCo2e] per unit or million US\$ of revenue) – Scope 2 emissions intensity (tCo2e per unit or million US\$ of revenue) – Energy intensity (MWh per unit or million US\$ of revenue) 	<ul style="list-style-type: none"> – % of revenues from low carbon or energy-efficient products – % of energy that is sourced from renewable sources – Scope 3 emissions (tCo2e)
 Waste and pollution	35%	<ul style="list-style-type: none"> – Total waste (tonnes [t] of waste) – % of waste that is recycled/reused/recovered – % of waste that is hazardous 	<ul style="list-style-type: none"> – % of revenues generated from products that are recyclable – Number of reportable waste- and wastewater-related incidents
 Water	20%	<ul style="list-style-type: none"> – Water use intensity (cubic meters [m3] per unit or million US\$ of revenue) – Operations exposed to water-stressed regions (as % of cost of goods sold and plant locations) 	<ul style="list-style-type: none"> – % of water that is recycled – Net freshwater consumption (m3)
 Land use and biodiversity	10%	<ul style="list-style-type: none"> – Proportion of suppliers assessed and audited on their biodiversity performance 	<ul style="list-style-type: none"> – Sustainable sourcing of main raw materials (third-party certification)

Semiconductors

The higher weighting on GHG emissions, water, and waste and pollution reflects the material exposure to regulatory and reputational risks arising from high levels of energy use, GHG emissions, waste generation, and water consumption across the value chain. Land use risks are less material for most operators in the industry.

Factor	Weight	Key performance indicators	Other performance indicators
 Greenhouse gas emissions	35%	<ul style="list-style-type: none"> – Scope 1 emissions intensity (tons of carbon dioxide equivalent [tCo2e] per unit or million US\$ of revenue) – Scope 2 emissions intensity (tCo2e per unit or million US\$ of revenue) – Energy intensity (MWh per unit or million US\$ of revenue) 	<ul style="list-style-type: none"> – % of revenues from low carbon or energy-efficient products – % of energy that is sourced from renewable sources – Scope 3 emissions (tCo2e)
 Waste and pollution	25%	<ul style="list-style-type: none"> – Total waste intensity (tons per million US\$) – % of waste that is recycled/reused/recovered – % of waste that is hazardous 	<ul style="list-style-type: none"> – % of revenues generated from products that are recyclable – Number of reportable waste- and wastewater-related incidents
 Water	30%	<ul style="list-style-type: none"> – Water use intensity (cubic meters [m3] per unit or million US\$ of revenue) – Operations exposed to water-stressed regions (as % of cost of goods sold and plant locations) 	<ul style="list-style-type: none"> – % of water that is recycled – Net freshwater consumption (m3)
 Land use and biodiversity	10%	<ul style="list-style-type: none"> – Proportion of suppliers assessed and audited on their biodiversity performance 	<ul style="list-style-type: none"> – Sustainable sourcing of main raw materials (third-party certification)

Software & IT Services

The higher weighting on GHG emissions reflects the energy used in operating data centers and the indirect emissions associated with electricity production. Conversely, operations are typically not water, waste, or land intensive.

Factor	Weight	Key performance indicators	Other performance indicators
 Greenhouse gas emissions	70%	<ul style="list-style-type: none"> – Scope 1 emissions intensity (tons of carbon dioxide equivalent [tCo2e] per million US\$ of revenue) – Scope 2 emissions intensity (tCo2e per million US\$ of revenue) – Energy intensity (MWh per million US\$ of revenue) 	<ul style="list-style-type: none"> – % of energy that is sourced from renewable sources – Scope 3 emissions (tCo2e)
 Waste and pollution	10%	<ul style="list-style-type: none"> – Total waste (t) – % of recycled and or certified materials used in packaging (% of total weight) 	<ul style="list-style-type: none"> – % of waste that is recycled/reused/recovered
 Water	10%	<ul style="list-style-type: none"> – Water use intensity (cubic meters [m3] per million US\$ of revenue) – Operations exposed to water-stressed regions (as % of cost of goods sold and plant locations) 	<ul style="list-style-type: none"> – % of water that is recycled – Net freshwater consumption (m3)
 Land use and biodiversity	10%	<ul style="list-style-type: none"> – Proportion of suppliers assessed and audited on their biodiversity performance 	

Material Social Risks

Technology companies are exposed to material social risks across their value chain:

- **Human capital management:** The sector is exposed to elevated human capital risks due to a lack of workforce diversity including high gender inequality and, in some cases, high employee turnover. As a result, talent acquisition and retention are critical to tech firms' intellectual property (IP).
- **Cybersecurity:** Many technology companies collect, manage, and monetize sensitive information for corporations and individuals. An inability to manage cyber risks and protect against data security breaches can cause significant reputational damage to companies.
- **Access and affordability:** The systemic importance of hardware and IT services to society and the economy makes accessibility of modern technologies a key social priority. Ensuring the affordability of services, including for low-income and underserved communities, is also relevant for companies' reputations and their management of regulatory risk.
- **Safety management:** Workforce safety is an important factor in manufacturing and in the supply chain. Long hours, poor working conditions, and lax occupational safety standards are major areas of concern as are physical dangers from chemical exposure and machinery, as well as mental health pressures.

Social Factors: Weighting and KPIs

The weighting of our social factors varies by sub-sector. We use similar indicators across the sub-sectors to inform our opinion of an entity's management of its social impacts relative to peers in the same sub-sector, although some may vary. Our opinion under our ESG Evaluation is also informed by qualitative indicators such as the quality and effectiveness of an entity's policy on safety and customer engagement, or its talent acquisition strategy.

Factor	Hardware	Semiconductors	Software and IT services
 Workforce and diversity	30%	35%	30%
 Safety management	30%	20%	10%
 Customer engagement	30%	30%	40%
 Communities	10%	15%	20%

Hardware

We apply an equal weighting to customer engagement, safety management, and workforce and diversity to reflect the significance of these factors to the industry. Companies are exposed to regulatory and reputational risk related to data security and privacy, and workforce safety in manufacturing and the supply chain. Recruiting and retaining a skilled, diverse workforce is critical to value creation and rapid innovation in the industry.

Factor	Weight	Key performance indicators	Other performance indicators
 Customer engagement	30%	<ul style="list-style-type: none"> – % satisfied customers (out of total customers responding to company's survey) – Net promoter score 	<ul style="list-style-type: none"> – R&D spending as % of revenues
 Safety management	30%	<ul style="list-style-type: none"> – Lost time injury frequency rate – Number of fatalities 	<ul style="list-style-type: none"> – Occupational injury frequency rate – Number and cost of product recalls as % of annual revenues
 Workforce and diversity	30%	<ul style="list-style-type: none"> – Voluntary/involuntary turnover rate (%) – % of woman in total workforce, junior and senior management positions, and in revenue-generating functions – Average amount spent per full-time-equivalent (FTE) employee on training and development 	<ul style="list-style-type: none"> – % of employees taking part in the employee survey – Gender pay gap – Average hours per FTE employee on training and development
 Communities	10%	<ul style="list-style-type: none"> – Spend on engagement with local communities as a % of EBITDA, revenue, or dividend – Proportion of suppliers assessed and audited for potential human rights breaches – Proportion of revenue, assets, or spend derived from conflict zones in the supply chain. 	

Semiconductors

We apply the highest weighting to workforce and diversity to underscore the importance of a skilled workforce in driving product innovation. Safety also carries a high weighting to reflect that product and workforce safety carry material regulatory and reputational risks. Companies in the industry are less exposed to issues related to community relations.

Factor	Weight	Key performance indicators	Other performance indicators
 Customer engagement	30%	<ul style="list-style-type: none"> – % satisfied customers (out of total customers responding to company's survey) – Net promoter score 	<ul style="list-style-type: none"> – R&D spending as % of revenues
 Safety management	20%	<ul style="list-style-type: none"> – Lost time injury frequency rate – Number of fatalities 	<ul style="list-style-type: none"> – Occupational injury frequency rate – Number and cost of product recalls as % of annual revenues
 Workforce and diversity	35%	<ul style="list-style-type: none"> – Voluntary/involuntary turnover rate (%) – % of woman in total workforce, junior and senior management positions, and in revenue-generating functions – Average amount spent per full-time-equivalent (FTE) employee on training and development 	<ul style="list-style-type: none"> – % of employees taking part in the employee survey – Gender pay gap – Average hours per FTE employee on training and development
 Communities	15%	<ul style="list-style-type: none"> – Spend on engagement with local communities as a % of EBITDA, revenue, or dividend – Proportion of suppliers assessed and audited for potential human rights breaches – Proportion of revenue, assets, or spend derived from conflict zones in the supply chain. 	

Software and IT Services

We place the highest weighting on customer engagement to reflect exposure to operational, regulatory, and reputational impacts related to data security and privacy and access to services. Our high weighting on workforce and diversity reflects the importance of attracting and retaining a skilled workforce in a competitive environment for talent and innovation in the industry. The low weighting on communities and safety management reflect that these are highly material risks for most operators in the industry.

Factor	Weight	Key performance indicators	Other performance indicators
 Customer engagement	40%	<ul style="list-style-type: none"> – % satisfied customers (out of total customers responding to company’s survey) – Net promoter score 	<ul style="list-style-type: none"> – R&D spending as % of revenues
 Safety management	10%	<ul style="list-style-type: none"> – Lost time injury frequency rate – Number of fatalities 	<ul style="list-style-type: none"> – Occupational injury frequency rate – Number and cost of product recalls as % of annual revenues
 Workforce and diversity	30%	<ul style="list-style-type: none"> – Voluntary/involuntary turnover rate (%) – % of woman in total workforce, junior and senior management positions, and in revenue-generating functions – Average amount spent per full-time-equivalent (FTE) employee on training and development 	<ul style="list-style-type: none"> – % of employees taking part in the employee survey – Gender pay gap – Average hours per FTE employee on training and development
 Communities	20%	<ul style="list-style-type: none"> – Spend on engagement with local communities as a % of EBITDA, revenue, or dividend – Staff volunteering in paid time 	

Submit Feedback

You can submit your feedback [online](#) or by [email](#).

Please specify which sector you are commenting on when submitting feedback.

We would particularly like to hear from you regarding:

1. Which risks are missing or not relevant?
2. Which KPIs are missing, could be enhanced, or are not relevant?
3. What views do you have on the suggested factor weights for the environmental and social analysis?
4. Do you have additional feedback(s) on this document?

Endnotes

¹ Events and issues are material for the ESG Evaluation when in our view they could meaningfully affect the entity's business operations, cash flows, legal or regulatory liabilities, access to capital, reputation, or relationships with key stakeholders and society more generally, either directly or through its value chain (upstream or downstream).

² We are mindful that some may be produced using different methodologies and scopes.

Related Research

- [“The ESG Risk Atlas: Sector And Regional Rationales And Scores.”](#) published July 22, 2020
- [“Our Updated ESG Risk Atlas And Key Sustainability Factors: A Companion Guide.”](#) published July 22, 2020
- [“Environmental, Social, And Governance Evaluation: Analytical Approach.”](#) published Dec 15, 2020
- [“How We Apply Our ESG Evaluation Analytical Approach: Part 2.”](#) published June 17, 2020
- [“ESG Evaluation: Worldline.”](#) published May 12, 2021

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