

Industry-Specific ESG Analysis: Examples

In our experience, a solid understanding of industry risk and profitability is critical in order to identify potential ESG threats and opportunities. These include exposure to positive or negative long-term sustainability-related trends. The material company-specific issues may vary, but most will be common within an industry. We thus recommend that the analysis starts with an industry perspective.

The industries discussed in this section represent several of the largest on the Nordic stock exchanges. We have also included examples from sectors that are smaller in a pan-Nordic context, such as oil service/offshore, but that represent interesting cases for ESG integration. This is not an exhaustive list and there are certainly many good candidates for inclusion that were unfortunately left out due to time constraints.

In order to place ESG information into context, we highlight the main value drivers for each industry at an overarching level. Nevertheless, we focus on the ESG issues most likely to be material within each sector, with examples from Nordic companies. For sectors not covered in this guide, the SASB Engagement Guide for Asset Owners and Managers provides a list of suggested questions for all major sectors (SASB, 2019).

3.1 Consumer goods

3.1.1 Staples

Within the Nordic countries, the consumer staples sector comprises primarily companies that produce food and beverages or household personal

products. These include fish farmers, such as Mowi and Salmar in Norway; alcoholic beverages producers like Carlsberg in Denmark; and consumer packed goods companies, such as Swedish Essity.

Companies in this sector face more stable demand trends than their counterparts in the discretionary sector. At a basic level, the key valuation drivers are margin and growth expectations. The example companies listed above vary in the extent to which they are able to command a price premium based on their brand, as opposed to more commodity-based pricing. On the cost side, the salmon farming sector stands out in terms of geographically-based supply restrictions. Barring technological innovations to scale up land-based production, salmon farming occurs only under specific coastal conditions, subject to government permits (Mowi, 2020). Salmon farming also entails a higher level of operational risk, since escapes or diseases can wipe out large swathes of production instantaneously. For consumer and packaged goods producers, there are generally fewer barriers to supply and more diversified operational risk. Salmon farmers also tend to control nearly the entire value chain, which is unusual for other consumer staples companies.

For salmon farming, the main ESG risk factors derive from *fish biology*. Stable production depends on keeping fish healthy and preventing escapes. This requires companies to take steps to prevent the spread of disease and salmon lice, as well as to treat infected fish. Harsh treatments can also impose physical stress on salmon, leading to reduced growth and potentially, mortality. These effects affect both revenues (total production) and costs (prevention and treatment measures). Fish escapes result in an obvious hit to top-line revenues but these may also include negative externalities for wild salmon populations. Mortality among the cleaner fish used to remove lice represents another negative externality. Most of the ESG considerations named here have a direct impact on the bottom line. For those that do not, it is important to remember that salmon farmers depend on licenses issued by public authorities. Regulators can therefore address negative externalities through additional concession requirements and/or industry-specific taxation.

Potential questions for salmon farming companies:

Question	Implication
What are the causes the company has identified for any previous disease outbreaks? What measures have been taken to prevent future outbreaks?	Designed to gauge the probability of downside tail risk due to disease. The company should include information on past outbreaks in its reporting, as well as slaughter weight (a rough measure of fish health).
What is the company's strategy for addressing the risk of salmon lice? Which treatments do you intend to use going forward?	Designed to gauge the probability of downside tail risk due to salmon lice. The company should include historic information on salmon lice per region in its reporting.
What measures has the company taken in response to any previous escapes?	Designed to gauge the probability of downside tail risk due to escapes. The company should include information on past escapes by region in its reporting.

Consumer staples firms tend to face the risk of *labour rights and animal rights abuses, as well as environmental violations in their supply chains*. These can lead to reputational damage and potentially supply bottlenecks as well (e.g., through worker strikes). The risk generally increases with supply chain complexity and exposure to jurisdictions with weaker social and environmental protections. In the agricultural sector, labour and human rights challenges include poor worker conditions, land rights disputes, and child labour, among others. Environmental risks include deforestation, pollution and water usage in drought-prone regions. Examples include campaigns against the use of palm oil in Norwegian confectionary products and NGO criticism of the use of Brazilian soybeans in fish feed. Although it is difficult to eliminate, companies can mitigate the risk through supplier monitoring, training and audits, use of certification schemes, and industry-level initiatives to raise market standards. Product traceability is another measure to reduce the risk (as well as ensure product quality).

Potential questions for consumer staples companies:

Question	Implication
What is the company's level of traceability from the individual supplier to the end product?	Designed to gauge the probability of downside tail risk due to supply chain incidents.
What are the company's environmental and social standards for suppliers and how do these assess compliance?	Same as above.
How does the company prioritise suppliers for ongoing assessment (e.g., by % spending) and how often does it conduct this assessment?	Same as above.
How does the company address supplier non-compliance? Can you provide any examples?	Same as above.

Climate transition risk is an ESG issue of growing importance for consumer staples companies. The effect can be positive or negative. For example, salmon farmers may profit from tailwinds due to the increased awareness of fish as a low-carbon protein source relative to meat. Consumer packaged goods companies can develop products designed to meet consumer preferences for more sustainable products, which include both the product itself and the climate impact from its packaging. This may be part of product branding.

Another way in which climate transition risk can affect consumer staples companies relates to their energy and water use. Stricter environmental regulations designed to address the causes and consequences of climate change could affect the company's access to and cost of obtaining these inputs, as well as the economics of recycling the company's products and/or packaging materials.

Potential questions for consumer staples companies:

Question	Implication
What does the company anticipate as being the long-term trend in its customers' preference for "climate-friendly" products?	Should the analyst adjust future cash flows to reflect the company's ability to meet shifts in long-term consumer preferences?
To what extent do climate considerations affect the company's R&D strategy for product development? Could you provide some examples?	Should the analyst adjust forecasted capex needs?
What are the key sources of the company's climate emissions footprint?	Will the company require additional opex ² to cover emissions-related costs (e.g., EU ETS) or capex to reduce emissions (e.g., convert factory to run on renewable energy)?

Consumer staples companies tend to face *physical climate risk* in their supply chain, such as crop failure due to drought or flooding, or in their direct operations. This can increase the price of raw materials, e.g., for feed or other inputs, thereby weakening gross margins. For salmon farming, higher ocean temperatures improve growth up to a point. If the temperature is too high, however, the risk of disease outbreaks and algal blooms increases.

² "Opex" is short for operational expenditures or costs, "Capex" is short for capital expenditures or investments in assets.

Potential questions for consumer staples companies:

Question	Implication
What has the company identified as its material physical climate risks in the supply chain and what is the strategy to address these?	Attempt to gauge vulnerability to assess the probability and potential impact from downside tail risk.
(For salmon farmers): How has the company assessed physical risk in the company's concession areas? What is the company's strategy to address identified risks?	Should the analyst include provisions for additional investments in climate mitigation, assess tail risk for concessions concentrated in a specific region?

Lastly, *pollution from packaging* is an ESG concern in its own right, in addition to the climate footprint of different packaging materials. Regulatory measures such as the EU Single-Use Plastic Directive illustrate growing awareness of the problem of plastic pollution in particular. Consumer preferences for sustainable packaging have grown in tandem. Companies have responded through innovation to both reduce the amount of packaging used and ensure that it can be recycled. Beverage producers have also begun to support deposit return schemes, seeking to shape their design, rather than oppose their creation outright (Coca-Cola Australia, 2020).

Potential questions for consumer staples companies:

Question	Implication
What percentage of product packaging is currently recyclable? Does the company have any targets to increase this percentage?	Should forecasts include increased outlays for additional R&D or opex to meet packaging targets?
What are the technical, financial or regulatory barriers to doing so?	Same as above.

Illustrative (not exhaustive) examples:

ESG-related financial impact matrix	Labour rights and environmental challenges in the supply chain	Increased customer preferences for sustainable products	Physical climate risk
Time horizon	Short-term and long-term	Short-term and long-term	Long-term
P&L effects			
Revenue	Loss of sales through reputational damage	Increased (decreased) revenue depending on shift in customer preferences toward (away from) company's product portfolio	Lower sales volume due to reduced access/higher prices for key input
Opex	Increased costs due to more limited access to inputs, to meet certification requirements, or to secure new suppliers with more rigorous social and environmental standards	Higher unit costs for more sustainable materials, reduced costs from any energy efficiency/resource utilisation improvements	Higher/lower operating costs due to crop failures, increased/decreased disease and growth conditions for a specific salmon farming concession
Capex	--	R&D to develop more sustainable products	Investments needed for climate resilience, e.g., de-licensing of salmon farming facilities
Balance sheet effects			
Liabilities/provisions	Fines/litigation in worst cases	--	--

3.1.2 Discretionary

The Consumer Discretionary sector includes automotive, household durable goods, leisure equipment, textile and apparel, luxury goods, consumer retailing and services, and hotels and restaurants. In the Nordic context, the sector spans a wide range of companies including Hennes & Mauritz, Zalando, Pandora, Electrolux, Boozt, Fiskars, Bygghem, Clas Ohlson, Scandic Hotels and Radisson Hospitality.

The consumer discretionary sector is similar to consumer staples in terms of the main drivers of valuation. It is more cyclical, however, since by definition it includes products that are not necessities. As a result, the industry is more volatile in response to changes in consumer preferences. For example, the industry is typically more exposed to social media campaigns related to the real or perceived sustainability characteristics of the company's products. Also, in contrast to companies in the consumer staples industry, consumer discretionary firms tend to be more directly involved with their end customers, for example, by selling directly to consumers through own stores.

This section focuses on the retail segment as an example to illustrate how sustainability-related analysis can affect the analyst's forecasted cash flows. The industry has developed at a fast pace over the past decade. The retail segment faces challenges since consumers expect fashion to be affordable, trendy and fast-paced. The shift from physical to online shopping has been a key disruption for traditional retailers.

Consumers are increasingly paying attention to the sustainability profile of retailers and of their respective product mix. The sustainability of the retailers' business model can be challenged when significant issues, for example labour issues, come to the public's attention. Major issues such as child labour in the supply chain or poor labour practices may impact the company's license to operate with significant brand impairment. (AccentureStrategy, 2018)

Online sales have grown, accounting for example for over 20% of total global sales in the luxury segment in recent years (Bain & Company, 2018). The uptake of direct retailing and e-commerce heightens risks associated with labour practices and increased employment costs. The

significant increase in online shopping demands that retailers be able to handle product returns. Estimates for returns of online purchases range from 15% to over 30%, compared with estimated return rates of 3% to 10% for in-store purchases (Kier, 2020). Returns are costly due to shipping and handling costs, and value loss when these products stay out of circulations. Return volumes therefore impact both sales volumes and inventories, and also increase the environmental footprint of online sales.

Based on how retailers tend to address sustainability challenges and opportunity at different stages of their value chain, the materiality of sustainability factors will differ.

Potential revenue impact

The potential revenue impact from sustainability-related concerns depends critically on the company's customer base. While interest in sustainability in global comparison ranks highly among Nordic (and particularly young) customers, the relative importance of price or garment quality is likely to rank far higher in other regions.

Product environmental footprint

Sustainable consumption is increasingly becoming a relevant theme, particularly in the Nordic markets. Since about 2017, awareness about the harmful environmental effects of plastics on ocean life became a major theme that began to affect consumer preferences – at least in Europe and North America. The emergence of new regulations reflects this trend. This is a new challenge for retailers, including companies that sell garments made of synthetic materials.

It remains an open question whether sustainability trends are an existential threat to fast fashion business models in particular. Potential responses may include shifting focus to regions where sustainability concerns are less salient, testing rental clothing models, and increasing transparency about clothing origin to allow for sustainability labelling of specific items. The analyst will have to decide

to what extent these measures are likely to materially affect revenue projections.

Supply chain management is critical in reducing risks to the company's reputation. The large product portfolio sold by retailers requires an extensive and complex supply chain. A solid sourcing strategy and audit of supply chains can help protect brand value and reduce the risk of revenue impairment. Examples of negative supply chain events on revenue include scandals involving labour conditions within supplier factories. For example, Boohoo faced negative publicity in 2020 following allegations of poor working conditions at a supplier factory in the UK, including wages below the legal minimum (Wheeler, 2020). Although the revenue effects were not immediately clear, the Boohoo share price dropped 16% within the first day following the news report (BBC, 2020).

Supply-chain related risks may also derive from the company's dependence on sourcing raw materials with high environmental impacts, such as cotton or leather. Sustainable sourcing policies that emphasise traceability and certification schemes can help mitigate these risks.

Potential impact on Opex

Supply chain management and resource efficiency

Sustainable sourcing and selection of items to stock can reduce retailers' environmental footprint. The impact on operating costs depends on the measures taken. For example, while improved resource efficiency, all else equal, has an unequivocally positive impact on operating costs, switching to more sustainable materials may involve higher costs. The margin effect would then depend on the company's ability to demand a premium for more sustainable products.

The adoption of circular business models can be a key strategic move to respond to consumer expectations, enabling retailers to eliminate waste, drive positive impact across the value chain and improve competitiveness. Circular business models can take different forms that can impact both revenues and operational expenses. Here are a few examples:

- *Circular supplies:* This approach replaces scarce or polluting raw materials with renewable, recyclable or biodegradable ones. For example, H&M Group has committed to use recycled or other sustainably sourced materials in all its products by 2030. (H&M, 2019) However, this ambitious goal might be challenging when considering the speed required by fast fashion cycles.
- *Recycling:* Nike's Flyknit technology is an example of using new production processes to reduce waste and resource leakage (Nike, 2019), saving valuable material, components and energy. On average, waste is down by 60% compared with cut-and-sew shoe manufacturing. (Liu, 2016)
- *Product life extension:* The retailer aims to buy back clothing purchases customers no longer use. The retailer will give the consumer a coupon for future purchases for each bag of old clothes returned (Webb, 2020). The garments collected are resold, refashioned into new textile products, or recycled.

The analyst will have to determine the extent to which the above measures are likely to materially affect future operating costs.

The rise of online shopping has required significant investments in cyber security. An increasing amount of data is gathered on each customer's habits and preference, which entail opportunities but also challenges in exploiting this data. Any data breach can affect customer loyalty and retailers will need increased IT spending to reinforce data security systems. Increasing global privacy regulations have increased compliance costs. At the same time, increased compliance regulations tend to favour the largest incumbent players over smaller upstarts that lack the resources to navigate complex regulations.

Balance sheet

Inventory management has to adapt to new emerging business models driven by increased focus on supply chain management. The company's supply chain strategy is critical to meet the market demands with

adequate speed. Heavy reliance on production in a single geographic region located far from the end customer can make supply chain lead times significantly longer than those of competitors. For example, the recent pandemic highlighted the vulnerability inherent in relying on a concentrated Asian manufacturing hub (Russell, 2020).

The move towards a circular economy may drive companies to rethink strategies that will impact their finished product inventories. For example, Ikea is experimenting with furniture leasing and plans to expand this to several markets. Under the program, customers rent their furniture for a set period before returning it for refurbishment, upcycling, resale or recycling. (IKEA, 2019) This type of product-as-a-service offering would, if rolled out in sufficient scale, impact current and future inventories on the company’s balance sheet.

Potential questions for retail companies:

Question	Implication
<i>Circular economy</i> Do you have a strategy to transition to a circular economy? Are you transparent on the sustainability of your product offering? Do you measure the sustainability footprint of your product mix? Do you disclose KPIs and long-term sustainability-related targets? How do you consider the health implications of your product mix? What is the company’s strategy to address the shift to online shopping?	This set of questions is designed to gauge the strategy to capitalise on the shift to a circular economy and new customer preferences. These questions also assess how the company measures and targets sustainability KPIs in its operational processes and product mix.

Question	Implication
<p><i>Supply chain management</i></p> <p>How complex is your supply chain?</p> <p>How often do you audit supplier operations?</p> <p>What types of traceability procedures are in place?</p> <p>What is the average length of commercial relationships with your suppliers?</p> <p>What is your process to approve new suppliers?</p> <p>Do you have a responsible sourcing policy?</p>	<p>This set of questions is designed to assess the vulnerability or strength of sourcing practices. Complex supply chains increase potential risks at different levels and will require thorough procedures to manage these risks.</p> <p>These questions will help assess tail risks associated with potential breach of human rights and labour rights in the supply chain, or potential disruptions to raw material supplies.</p>
<p><i>Resource efficiency</i></p> <p>What are your environmental programs to improve resource efficiency and minimise environmental impacts?</p> <p>How do you source raw materials such as cotton or leather in a sustainable manner (e.g., use of certification schemes)?</p> <p>What is the energy efficiency of your operations?</p> <p>Do you have plans to reduce the carbon footprint of your operations, including transportation and freight?</p>	<p>This will help evaluate the potential implications for the company's long-term cost base through changes in the materials used and the company's resource efficiency.</p> <p>Traceability of product is becoming a customer requirement and a lack of focus on this issue can impact revenue growth.</p> <p>Transparency on consumer products' environmental footprint is increasing and new trends around local product consumptions are accelerating with implications for long-term growth opportunities.</p>
<p><i>IT investment and cyber security</i></p> <p>What processes have you implemented to manage access to sensitive customer data?</p> <p>How much has been invested in cybersecurity technologies?</p> <p>Have you experienced a cyberattack?</p> <p>If so, what was the financial impact?</p>	<p>The move to online shopping entails new infrastructure requirements to protect against cyber-attacks or sensitive data leaks. This set of questions can help assess potential tail risks.</p>

Illustrative (not exhaustive) examples:

ESG-related financial impact matrix	Trend towards more sustainable consumption preferences	Supply chain labour issues	Circular economy
Time horizon	Short-term and long-term	Short-term and long-term	Long-term
P&L effects			
Revenue	Sustainable product mix (esp. if offered at a premium)	Sales decline through reputational risk, both with end customers and third-party platforms that sell the company's products	New revenue models with product leasing, reuse, etc.
Opex	Potentially higher wage or input costs to meet sustainability requirements	Costs associated with handling supply chain disruption, e.g., cost of immediate switch to new suppliers	Potentially higher input costs to ensure product quality is sufficient to permit reuse
Capex	R&D to improve sustainability characteristics of existing products Innovation for new technology, online platform, digitalization.	--	Investments needed to build new business model, e.g., platform for rental, logistics operations for product collection and reuse
Balance sheet effects			
Assets	Inventory management	Loss to intangible value of brand	Intangible value of brand, potential write-downs for obsolete inventory under new business model

3.2 Energy

3.2.1 Oil and gas exploration and production (E&P)

Companies in E&P sell a commodity product subject to high levels of price volatility. Return on equity for E&P companies is typically low across an entire cycle due to cost inflation when oil prices increase. Therefore, investors tend to emphasise dividend payments and share buybacks in pricing E&P company shares. Demand dynamics include overall GDP growth as well as growth in energy intensive industries, such as transportation and power production. On the supply side, geopolitical developments in key oil producing markets contribute to price swings (e.g., sanctions against Iran and Venezuela). The Organization of Petroleum-Exporting Countries (OPEC), a cartel of oil producers, also limits supply artificially through agreements to hold back production. Since the mid-2010s, new developments in hydraulic fracturing (“fracking”) technology permitting horizontal drilling have been a key factor in vastly expanding global oil and gas supply. Moreover, fracking is a more flexible source of supply than, for example, offshore oil and drilling projects, which typically take a decade or more to develop. As a result, oil price peaks have been far less durable since 2014.

It is important to differentiate between the oil and gas market, as gas has traditionally been a regional, rather than a global market. That is changing due to better transportation options with liquefied natural gas but suffice to say, the dynamics differ between the two markets.

On the cost side, E&P companies vary in their field positioning on the cost curve. Generally, oil that is more difficult to extract (e.g., due to location or product quality) will be more expensive and more carbon intensive. Field location is a key source of both environmental and geopolitical risk.

From the end of 2018 through early 2020, there was a dramatic multiple contraction for E&P companies. The corresponding multiple expansion for renewables firms suggests climate-related investor focus is at least a partial factor explaining this development. Anecdotally, although project-by-project discounted cash flow models are considered the gold standard for valuation, use of multiples techniques remains more widespread for the E&P

sector. Historically, multiples tended to closely track dividend yields. This appears to have changed since 2018, consistent with the significant rating contraction for E&P companies.

Lastly, although Section 8 of this guide includes a comprehensive discussion on use of adjusted discount rates to reflect ESG considerations, there are anecdotal examples of investors making beta adjustments to reflect expected investor preferences.

Environmental risks include water consumption, climate transition risk, and pollution through spills and leaks. Over the past decade, there have been major changes in companies' approach regarding climate change (e.g., proliferation of carbon emissions reduction pledges). NGO campaigns and climate-related shareholder proposals actively target E&P firms. The industry has become a flashpoint for divestment campaigns. The dominant environmental and macro theme affecting the long-term prospects of the industry is the global commitment to transition to a low carbon economy.

Looking to the emissions profile of an oil and gas company, direct emissions from the company's activities and power purchases (Scope I and II, respectively³) typically amount to roughly 10% of overall lifecycle emissions. The remaining 90% derive from customers' burning of hydrocarbons (Mathis, 2020). Unless a company's activities include refining or the operation of gas stations, it typically has few levers available to reduce scope III emissions, barring a shift in the company's production mix from oil to lower carbon fuels such as natural gas.

The role of gas in decarbonisation remains unclear. Nevertheless, switching from coal-fired to natural gas power generation (even in the absence of carbon capture and storage) could significantly reduce emissions prior to the large-scale rollout of emissions-free technologies. Therefore, the IPCC identified natural gas power generation as a "bridge technology" – preferable to coal in the short-term, but not a long-term solution for decarbonising power generation (The Intergovernmental Panel on Climate Change, 2014, p. 21). Naturally, changing the company's production mix between two different commodities would affect expected cash flows.

³ See an illustration of the concepts of Scope I,II and II emissions in Figure 3.1.

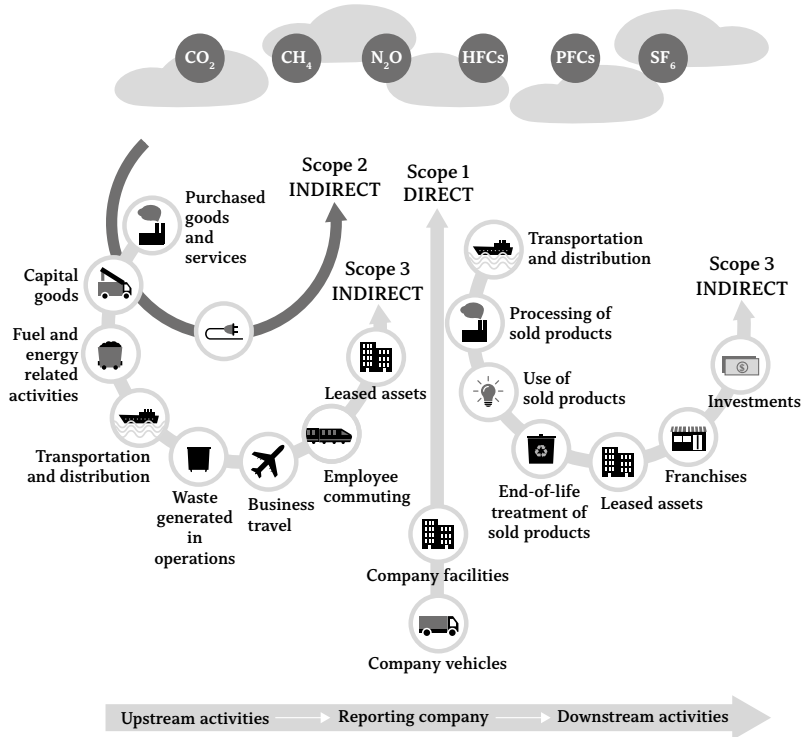


Figure 3.1 Illustration of Scope I, II and II Emissions in a Company Value Chain.

Source: Greenhouse Gas Protocol, 2016.

Climate transition risk for E&P companies derives from technological innovation, carbon pricing and other regulatory measures, as well as the withdrawal of industry subsidies. These risks vary significantly depending on the individual company's exposure to carbon pricing regulations, type of fossil fuel extracted, as well as field positioning on the cost curve.

One of the main climate-related concerns for E&P companies relates to the risk of *stranded assets*. Popularised in the 2014 report from NGO Carbon Tracker Initiative, *Unburnable Carbon*, this concept refers to the risk that achievement of the two-degree scenario would prevent E&P companies from extracting current reserves in the future (Carbon Tracker Initiative, 2014). The premise is relatively straightforward: the authors multiplied

the proven reserves of listed coal, oil and gas companies, multiplying each reserve type by an estimated emissions factor (Carbon Tracker Initiative, 2014, p. 6). The total estimated emissions potential of 745 GtCO₂ exceeds the 565 GtCO₂ estimated remaining global carbon budget per 2014 (for all activities – not fossil fuel extraction alone) under a two-degree scenario (Carbon Tracker Initiative, 2014, p. 8). Coal reserves alone account for over half of the 745 GtCO₂. Hence, listed companies will be unable to extract all proven reserves under a two-degree scenario; nor will they be able to add any new reserves.

Critically, the stranded assets valuation argument rests on the premise that energy companies are valued based on their reserves (accounting values), and that the risk of stranded assets is not already reflected in companies' stock prices. These assumptions are not obvious. As evidence, Carbon Tracker points to the share price impact of Shell's reserve restatement in January 2004 to indicate that "an oil major's reserves contribute around 50% of the financial value attributed to the company by investors." (Carbon Tracker Initiative, 2014, p. 19). Setting aside the wisdom of extrapolating the share price impact of a single company announcement to draw a broader conclusion about the correlation between share prices and reserve values for an entire sector, calculating E&P equity prices from reserve values is far from a straightforward exercise. Not only are there challenges in using book values to estimate market values, but reserve values (measured as revenue per barrel of oil equivalent) measure only top-line impact, ignoring tremendous variation in the costs of extraction and therefore, reserve profitability. Rather, the biggest risk of stranded assets concerns undeveloped reserves.

For a traditional DCF valuation, the stranded assets argument about unburnable carbon is perhaps better understood as the risk to long-term volume and price forecasts given climate-related constraints. These include, for example, changes in demand due to technological development, as well as regulatory costs, such as long-term CO₂ tax assumptions. Admittedly, changes to companies' long-term oil price assumptions would require reserve write-downs. Nevertheless, the sources of error in using reserves for valuation are so numerous that analysts should exercise caution in discarding a discounted cash flow in favour of a reserves-based valuation approach.

E&P companies differ in their strategies with respect to *renewables*. While some remain pure players focused on oil and gas, others have begun to diversify into renewables. There are examples of both in the Nordic universe. Regardless of the strategy chosen, it is important for the analyst to understand the implications of the chosen strategy for margins, dividend payments, and capital structure going forward.

In terms of *pollution*, the nature of the operating environment as well as the relevant regulatory framework affect the risk level. For example, the risk and impact of spills is greater in harsh environments that complicate clean-up efforts.

Environmental impact and water consumption are additional factors that might affect the project cost base, future liabilities and capex. Water is used in large quantities for drilling, hydraulic fracturing and oil sands operations. It is also consumed in downstream activities such as steam generation and cooling. Improving water consumption efficiency and recycling will affect operational costs. Managing environmental risk appropriately can reduce the risk of financial penalties in the future. The analyst will need to assess the level of environmental provisions and their adequacy in light of the company's risk exposure and operational practices.

Potential questions for oil and gas companies on environmental issues:

Question	Implication
What are your long-term carbon price assumptions?	As carbon price assumptions rise, so too will the expected returns the company demands for new oil and gas projects. For E&P firms with a renewables portfolio, project economics are even more sensitive to carbon price assumptions than for oil and gas projects. A higher carbon assumption price could therefore accelerate a shift towards renewable energy production, while incentivising more modest optimisation among individual assets in the oil and gas portfolio.
How are world governments' long-term climate commitments integrated into your long-term strategic planning? What are the different scenarios you are running and what are their financial implications? What probability do you assign to each scenario?	How resistant is the company's current portfolio to changes in the speed and scale of government responses to climate change?
Particularly for firms involved in hydraulic fracturing: Do you quantify water-related costs? What percentage of water is recycled or reused in the company's operations?	Particularly for companies operating in water-stressed areas, increased water demand combined with future environmental regulations could require additional investments to reduce or recycle water usage, as well as increased water-related opex.
Are there scenarios in which the amount of environmental provisions on your balance sheet might increase?	Provision adjustment

Geographic constraints on E&P (hydrocarbons are where they are) pose a range of social and governance challenges for companies. The latent risk of *corruption* is high for operations in countries with weak governance structures, combined with an industry dependent on large-scale contracts with authorities. The Petrobras scandal, in which politicians and company officials

received a combined total of several billion USD in bribes through supplier overbilling represents a high-water mark for corruption in E&P (The United States Department of Justice: Office of Public Affairs, 2018). The sophistication of the company's risk assessment and compliance program should be commensurate with the risk.

Relations with local communities and authorities are other key factors for E&P companies, particularly for operations in less developed countries. Poor relations (e.g., demonstrated through protests or disagreements about local content requirements) can result in delays, and even cancelled projects.

Worker health and safety, including both the company's employees and its contractors, is a factor that typically receives little attention until something goes wrong. The downside tail risk from work accidents can be enormous, as illustrated by the BP Deepwater Horizon blowout in 2010 (Busso, 2018). Anecdotally, the authors are unaware of any examples of the inclusion of health and safety factors *ex ante* in E&P valuations, due to the low probability of this type of tail risk in any given year. The dramatic impact on valuation *ex post* of an accident like Deepwater Horizon is, however, undisputed.

Potential questions for oil and gas companies on social issues:

Question	Implication
What percentage of employees received annual training on health and safety?	Indication of tail risk for work accidents
Percentage of sub-contracted workforce? How do the injury and near-miss statistics for contractors compare to those of employees?	Indication of tail risk for work accidents
How does the company engage with local communities? Do you have a formal program for local grievances?	Indication of tail risk from community grievances (e.g., exploration near traditional fishing communities), which could lead to project delays or cancellations
What is the company's exposure to anticorruption regulation such as the US Foreign Corrupt Practices Act or the UK Bribery Act? Has the company been sanctioned for corruption violations previously?	Suggests tail risk of substantial fines, particularly for companies with previous violations
To what extent does the company rely on sales agents versus own employees for entering contracts in high-risk jurisdictions?	Use of agents typically carries a higher risk as they are more difficult to monitor than employees

Illustrative (not exhaustive) examples:

ESG-related financial impact matrix	Extension of carbon pricing to new geographic regions	Corruption	Well blowout
Time horizon	Short-term and long-term	Short-term and long-term	Short-term and long-term
P&L effects			
Revenue	--	Potential loss of concessions	Project stop; reputational damage could negatively impact competitiveness for future bids.
Opex	Increased opex for companies with new carbon price exposure (e.g., through extension of carbon pricing scheme to new region).	Bribes may be baked into reported opex; new compliance requirements require hiring of staff, greater administrative oversight.	--
Capex	May require new capex to reduce carbon-intensity of existing infrastructure; avoidance of projects that no longer meet the company's return requirements under new carbon price expectations.	--	Investments to replace damaged or destroyed assets

ESG-related financial impact matrix	Extension of carbon pricing to new geographic regions	Corruption	Well blowout
Time horizon	Short-term and long-term	Short-term and long-term	Short-term and long-term
Balance sheet effects			
Liabilities/provisions	Write-downs of any fields that are no longer economically feasible under new carbon price expectations (e.g., many oil sand fields from 2014-20).	Fines/litigations, particularly from US authorities	Cost of fines/litigation, compensation to workers'/contractors' families

3.2.2 Renewables

While “renewables” is not a sector as such, this section is meant to address both utilities with renewable energy production, such as Danish Ørsted or Norwegian Scatec as well as non-utilities, such as Nel or Bonheur in Norway, that are direct suppliers to renewable energy producers. For valuation, key factors include assumptions for relative energy prices and volumes, as well as the type of production contract (e.g., market rates or fixed price), and technologically driven cost reductions. Maintenance of existing projects and farm-downs (sales of project equity to outside investors) may also form significant revenue components. Ideally, the analyst should value renewable producers project-by-project, but companies do not always provide enough granular information to make this feasible. Renewable energy projects typically require high upfront capex, but with a long project life and (compared to the oil and gas sector) relatively stable, but typically more modest cash flows.

From 2018-2020, these companies experienced a significant multiple expansion relative to their E&P counterparts. For utilities in particular,

exposure to renewable energy has transformed the sector from a staid, bond proxy to a growth sector. Among the Nordic renewables firms, there are also significant differences in the extent to which valuations rest on exponential growth, as well as differences in current profitability.

Climate change dominates ESG considerations for renewables companies, given the forecasted explosion in demand for “green electrons.” The emissions goals of companies in many of the other sectors listed in this guide depend on greater electrification, along with renewable power sources. *Climate transition risk* for this industry is thus primarily positive. Technological innovation could nevertheless make certain renewables technologies obsolete. Moreover, increased competition and cost innovation can lead to commoditisation of technologies currently considered cutting-edge. Analysts will need to determine whether the company is likely to maintain a lasting competitive advantage over time, as well as the extent to which size and scalability may grow in importance as the various sub-industries mature.

Regulation designed to incentivise the production of renewable energy, often through subsidies, purchasing power agreements or favourable tax agreements, form another example of climate transition risk for renewables. The form and timing of these regulatory measures are a key input needed to accurately estimate future cash flows. Unfortunately, companies seldom report this information in detail at the project level.

Note that the risk of stranded assets applies to the renewable sector as well – particularly when new technologies are involved. Despite an accelerating structural shift towards a low carbon economy, a company that develops a new technology to reduce emissions can, for example, risk becoming obsolete if a competitor develops a superior or lower cost alternative.

The material social risks differ significantly among firms within this category. For large-scale utilities, the *Not in My Backyard* (NIMBY) phenomenon can be a significant source of local community and regulatory pressure. This is particularly true for onshore wind and for hydropower production, although offshore wind (e.g., off the coast of Martha’s Vineyard in the United States) has also met community resistance, and even litigation. The risk is less salient (but not absent) for solar projects, given a smaller

footprint. Concerns about *the impact of renewable projects on local wildlife* can be another source of community concern. Examples include concerns about birds flying into windmills and solar projects destroying the habitats of desert tortoises (NRDC, 2012).

Risks related to governance, e.g., corruption, depend largely on project location. For projects in regions with weak governance and high corruption risk, the questions printed above for E&P companies may also be relevant.

Potential questions for renewables companies:

Question	Implication
What are your long-term carbon price assumptions?	High inverse correlation between the long-term carbon price and the required rate of return for renewable energy projects.
To what extent do the company's projected targets depend on favourable environmental regulation or subsidies?	Should the analyst adjust forecasted revenues, costs or capex to reflect expectations of tailwinds from favourable regulation or subsidies?
How does the company engage with local communities? Do you have a formal program for local grievances?	Suggests tail risk of project delays and even cancellations, as well as litigation.
What are the main risks to wildlife from the company's activities? Has the company experienced any community or regulatory resistance on these issues? What is the company's strategy to address the risk?	Suggests tail risk of project delays, litigation.

Illustrative (not exhaustive) examples:

ESG-related financial impact matrix	Resistance to proposed renewable power production location	Technological changes that accelerate electrification (e.g., improved battery technology)	Removal of government subsidies as industry matures
Time horizon	Short-term	Short-term and long-term	Short-term and long-term
P&L effects			
Revenue	Depends on the project outcome: cancellations eliminate future revenues outright. Delays or reductions in project size are also possible.	Increased revenues as renewable generation becomes more attractive relative to the use of fossil fuels.	More volatile revenues as producers exposed to market price.
Opex	Potentially increased opex to meet additional environmental or social requirements.	--	--
Capex	Investment may be needed to meet additional siting requirements, or to find a new site altogether.	Increased investment in new generation to meet demand, potentially lower cost of financing through access to green loans or bonds.	Potentially reduced capex if greater uncertainty about long-term asset profitability.
Balance sheet effects			
Liabilities/provisions	Potential compensation for affected communities, environmental fines.	--	--

3.2.3 Service and offshore

The service and offshore sector includes companies involved in seismic surveying, engineering, subsea services, and supply operators to E&P customers. Increasingly, however, certain segments of the service and offshore sector have become significant suppliers to renewables projects as well, particularly within offshore wind.

The service and offshore sector is highly cyclical, traditionally driven by E&P capex budgets, which in turn depend on long-term oil price expectations. High oil prices have led to waves of above-average profits, followed by over-ordering (particularly in offshore supply segments) and subsequent downturns. Key factors affecting company resilience in a downturn include balance sheet strength as well as contract length. Companies in this sector differ in the standard length of contracts with customers. Seismic companies typically have the shortest contracts, lasting only a few months, whereas the subsea sector can have contracts of up to two-to-three years. In the engineering and subsea segments, companies typically have fixed price contracts, meaning that they assume project risk through completion of the service (e.g., subsea cable installation).

Climate transition risk is perhaps the key ESG challenge for the sector – that is, the transition to a low carbon economy. As noted above, the various segments of the service and offshore sector differ in their ability to attract customers outside of the oil and gas industry. For example, for seismic companies, low-carbon transition business opportunities remain limited. Within the subsea and engineering segments, however, experience from offshore oil and gas projects is transferrable to offshore wind. Although renewables margins for these companies initially paled in comparison to those of oil and gas contracts, the gap has narrowed considerably as E&P capex budgets shrink and offshore wind project volumes increase. At the time of writing, renewable projects were both higher growth and involved a lower cost of capital.

Similar to the E&P sector, *corruption* and *worker health and safety* are common ESG risks for service and offshore companies. Service and offshore companies mirror their customers' exposure to jurisdictions with high corruption risk (e.g., Angola, Brazil). In addition, completion of complex

projects – often in harsh marine environments – requires comprehensive security procedures to prevent work accidents. The Deepwater Horizon incident, referred to above, is an obvious example. Rig operator Transocean lost nine employees in the accident and ultimately paid total legal claims in the billions of dollars (Ingram, 2013).

Illustrative (not exhaustive) examples:

ESG-related financial impact matrix	Climate transition risk	Corruption	Well blowout
Time horizon	Short-term and long-term	Short-term and long-term	Short-term and long-term
P&L effects			
Revenue	Depends on supply and demand dynamics relative to E&P alternative contract.	Potential loss of contracts	Project stop: reputational damage could negatively impact competitiveness for future bids.
Opex	--	Bribes may be baked into reported opex, new compliance requirements require hiring of staff, greater administrative oversight.	--
Capex	Potential increase in capex to meet specifications of new products (e.g., larger supply vessel to accommodate increasing wind turbine blade size).	--	Investments to replace damaged or destroyed assets.

ESG-related financial impact matrix	Climate transition risk	Corruption	Well blowout
Time horizon	Short-term and long-term	Short-term and long-term	Short-term and long-term
Balance sheet effects			
Liabilities/provisions	Write-off of assets that are less valuable in a low carbon economy, e.g., seismic data from particularly carbon-intensive fields.	Fines/litigations, particularly from US authorities.	Cost of fines/litigation, compensation to workers' families.

3.3 Financials

3.3.1 Banks

Within the banking sector, firms vary significantly in their business models and risk exposure, from the largest and systemically important banks such as Nordea and DNB, to more regional or national savings and loan institutions, to banks that specialise in consumer finance.

The most important income line for banks is *net interest income (NII)*: the difference between the interest the bank pays, and interest charged to customers. The bank also derives revenue from *fees and commissions*, including fees from credit card usage, asset management fees, and market fees. On the cost side, banks vary significantly. For example, a bank that emphasises mortgage lending will typically have lower costs than one that focuses on market activities, although the latter typically binds more capital. A third important factor for banks is *asset quality* – or the credit risk profile of their loan portfolio. Lastly, perhaps more than any other sector, banking valuations depend heavily on *capital structure*. Banks are often valued based on their return on expected capital and dividend potential. The banking sector is heavily regulated. Requirements for capital ratios (e.g., the amount of capital the bank must hold based on its risk-weighted

assets) and accounting rules for valuing loan books are among the most important valuation drivers.

From an environmental perspective, banks with a significant corporate lending portfolio face increased questioning over their exposure to *climate transition risk*. Since the oil price collapse in 2014-2015, value depreciation and increased refinancing risk in the offshore and supply industries have made these segments a source of significant uncertainty for corporate loan portfolios. At the time of writing, it is too early to tell whether scepticism about the longevity of fossil fuel-related industries might translate into higher funding costs for the banks holding these portfolios. Moreover, proposals for EU regulation to adjust capital requirements in response to the sustainability credentials of the underlying assets would, if implemented, have an immediate negative impact on the potential ROE for banks with the greatest exposure to the fossil fuel industry. At present, the analyst has to make a subjective call about the probability and eventual scope of changes in funding costs and capital requirements, absent more concrete regulatory pronouncements.

Potential questions for banks:

Question	Implication
What requirements does the bank have regarding the ESG status of new clients? ⁴ Has the company charged a higher/lower funding cost based on a corporate customer's sustainability profile? How many basis points is the difference?	Should the analyst adjust NII upward/downward to account for, e.g., sustainability-linked lending or for higher lending costs charged to more sustainability-challenged industries?

Another potentially material ESG issue concerns the bank's *responsible lending* practices. Particularly for banks in the consumer finance market, as well as financial advisory services, negative publicity surrounding their treatment of customers can negatively affect the bank's license to operate and spur regulatory action. This kind of regulatory pressure could result in

⁴ Examples of lending-specific ESG standards include the Responsible Ship Recycling Standards and the Poseidon Principles, which involve climate- and resource-specific requirements.

lower growth, a more inefficient capital structure, and higher losses from stronger consumer protection. Even for mortgage lending, (a relatively stable market segment) concerns about increasing household debt have led the regulator in Norway to impose additional lending limits meant to prevent individuals from taking on more debt than they can manage.

Potential questions for banks:

Question	Implication
What percentage of mortgage loans reach the maximum amount for the individual according to Financial Supervisory Authority regulations?	Is there, for example, a risk of regulators implementing additional capital buffers to guard against potentially unsustainable lending practices?
How many complaints were filed over the past year related to company lending practices? Did any complaints result in fines or other penalties for the company?	Should the analyst include expected fines/penalties in forecasted cash flows?

Perhaps more than any other ESG issue, a bank's *compliance focus and capabilities* can have a significant, material impact on valuations. These include fines and penalties, which can be substantial for money laundering or sanctions violations – particularly for banks exposed to US regulators. Less commonly appreciated are the costs of implementing compliance improvements, in terms of the resources and additional personnel required, as well as the demands on management and board time, potentially at the expense of addressing core business concerns. Money laundering cases involving Nordic banks from 2018-2020 also involved higher funding costs for these banks in the bond market. This was likely due to significant uncertainty about potential fines, but perhaps also reluctance from sustainability-focused funds to purchase securities issued by companies involved in serious controversies. Association with compliance scandals can negatively influence customer trust and the bank's license to operate. During the recent scandals, there were examples of institutional customers that publicly refused to renew framework agreements with their bank on this basis.

Note that for the banking sector as well as other industries, the level of sophistication in the company's compliance program is likely to reflect a combination of its preparedness to prevent, detect and respond to future incidents as well as its inherent risk level. For example, it is not an accident that companies with previous involvement in the largest anti-money laundering or corruption scandals typically have the most advanced compliance programs. The challenge for the analyst is to determine whether the program in place is well-designed to address forward-looking risk, thereby reducing tail risk from new scandals.

Potential questions for banks:

Question	Implication
Has the company received criticism from its regulator(s) related to compliance concerns? Has the bank corrected all deficiencies identified? If so, what was the approximate cost of doing so in terms of additional personnel, outside services, and other resources (e.g., IT platforms)?	Do compliance improvements suggest the bank will be better prepared to prevent compliance breaches in the future?
Is the bank the subject of any current investigations – and in which jurisdictions?	Should the analyst expect additional fines in the future? The level of fines varies significantly by jurisdiction and by whether the investigation involves money laundering or sanctions violations.
How often does the board address compliance issues? Approximately what percentage of a typical work-week does management devote to compliance matters? How does this compare to previous practice (e.g., prior to a compliance scandal)?	Are management and the board devoting sufficient time to compliance – and conversely, do they have enough time to address business challenges as well? Jurisdictions such as the US typically offer a fine reduction for exceptional compliance improvements. At the same time, should the analyst adjust expectations for the company's ability to deliver on stated targets if the leadership team and board are preoccupied with putting out fires?

Illustrative (not exhaustive) examples:

ESG-related financial impact matrix	Money laundering and/or sanctions violations	Climate risk in loan portfolio	ESG integration in credit assessments
Time horizon	Short-term and long-term	Long-term	Short and long-term
P&L effects			
Revenue	Reputational effects can negatively impact customer demand.	Depends on ability to assess credit risk due to climate-related factors, e.g., higher/lower funding costs for borrowers with higher/lower climate risk.	Differentiated funding costs based on borrowers' sustainability performance.
Opex	Increased costs to support additional compliance personnel, added routines.	Incremental increase in opex to integrate climate risk in credit assessment process.	Incremental increase in opex to integrate ESG in credit assessment process.
Capex	Investments in e.g., IT systems to improve compliance monitoring.	--	--
Balance sheet effects			
Liabilities/provisions	Fines/litigation	Asset write-offs, potential regulatory requirements linking capital ratios to loan portfolio environmental parameters.	To the extent ESG assessments better inform credit risk evaluations, fewer write-offs, and higher quality loan portfolio.

Case Study: Danske Bank money laundering scandal

In September 2018, the findings from an independent investigation of Danske Bank and its branch in Estonia was published. The investigation analysed 15,000 customers in Estonia, and total flow of payments of around EUR 200 billion, of which “it is expected that a large part of the payments was suspicious.” (Bruun & Hjejle, 2018, p. 7) It found that of the 15,000 customers analysed, 6,200 hit the most risk indicators. Of these, the vast majority were found to be suspicious.

To put the flow of payments in perspective, the GDP of Estonia in 2017 was €29 billion and the figure in question approaches two thirds of the GDP of Denmark itself at €324 billion. (Source: <https://newsoncompliance.com/danske-bank-the-story-of-europes-biggest-money-laundering-scandal/>) In connection with the publication of the investigation, Ole Andersen, then Chairman of the Board of Directors, acknowledged:

The Bank has clearly failed to live up to its responsibility in this matter. This is disappointing and unacceptable and we offer our apologies to all of our stakeholders – not least our customers, investors, employees and society in general. We acknowledge that we have a task ahead of us in regaining their trust. (Danske Bank, 2018)

As of the date of writing, Danske Bank was under investigation with the Danish, US, French and Estonian authorities. The Danske Bank annual report quantifies various impacts of the AML case. These included a DKK 10 billion capital requirement the Danish Financial Supervisory Authority imposed on the bank to ensure solvency to meet future penalties (Danske Bank, 2020, p. 153), as well as DKK 4.1 billion in remediation costs in 2020 related to compliance (Danske Bank, 2020, p. 23).

3.3.2 Insurance

At the risk of oversimplification, insurance valuations reflect the company’s ability to generate greater income from premiums than it pays out in claims (*insurance results*), as well as the financial returns from investing premiums throughout the year (*investment results*). In the Nordic market, insurance

companies typically have a *combined ratio* (equal to the sum of costs and claims, divided by income) of 80 to 90 percent. This compares favourably to other geographic markets, with combined ratios of close to 100%, meaning those companies generate earnings solely from investment results. In other words, Nordic insurance firms typically have a positive underwriting result, generating income from both their insurance underwriting and asset management. Insurance results are higher quality earnings than investment results, as they are more resistant to economic cycles.

Turning to ESG considerations, *property insurance* companies face *physical climate risk* owing to the damage that more severe weather and flooding can wreak on insured assets. Importantly, however, the impact on insurance companies depends on the quality of their underwriting models in assessing climate risk. Whether the claims ratio (claims divided by income) increases depends on the company's ability to reprice insurance premiums. For example, there are recent examples of Nordic insurance companies justifying auto insurance premium increases by more extreme winter weather, as well as the higher cost of repairing electric vehicles (as opposed to those with internal combustion engines).

The key question for insurance results is whether the company is able to collect sufficient premiums to offset the risk. In some cases that may entail declining to insure assets – those which the company might not be sufficiently compensated for the risk they would assume. In the Nordic countries, insurers have proven fully capable of adjusting their pricing models to account for new risks. In that sense, climate risk could pose an opportunity for property insurance companies. An additional complicating factor involves whether and to what extent regulators might adjust insurers' capital requirements to account for climate risks. In sum, it is not clear *ex ante* whether physical climate risk is unambiguously negative for the insurance industry.

For *life insurance*, changing demographics put pressure on existing state-sponsored systems. There is a need for increased savings provisions. Holders of longevity risks, typically individuals, employers and government, can transfer this risk to the insurance industry. Life expectancy is here a key assumption that will impact future liabilities. Similarly, the ageing

population has increased the need for healthcare and long-term care in old age. This represents an opportunity for the insurance sector to offer *health and/or long-term care insurance* to meet this demand.

Providers of pensions also more broadly face the risk of sustainability-related impacts on the results of their investment portfolios. Sustainability-related asset price changes could affect the insurer's ability to meet its obligations to current or future beneficiaries.

Potential questions for insurance companies:

Question	Implication
How does the company assess physical climate risk exposure in its portfolio of insured assets? Can you provide an example of how this assessment has informed the underwriting process?	Does the company's answer provide confidence that they have assessed climate risk systematically and are thus, more likely to price the risk accurately? If not, the analyst might want to consider e.g., increasing the expected claims ratio or predicting greater claims volatility.
To what extent have environmental risk assessments affected premium rates? Can you provide an example?	Assesses whether the company has the ability to raise premiums (top-line income) in response to increased risk.
How do you mitigate against longevity risks?	Should the analyst adjust life insurance company cost projections to account for unfavourable demographic trends?
What is your strategy for targeting the ageing population for your products?	Should the analyst adjust forecasts to include new/increased revenues from products designed to serve an ageing population?

In terms of social considerations, insurance companies face regulatory scrutiny owing to their *role in society in promoting financial stability*. As a result, insurance companies are subject to capital requirements to ensure institutional stability, but that limit the expected return on equity. In times of crisis, regulators may implement additional controls, such as Financial Supervisory Authority restrictions on dividend payments during the Covid-19 pandemic.

The corollary of the insurance industry's unique social role in society is a latent source of regulatory risk for insurance industry valuations.

Potential questions for insurance companies:

Question	Implication
Does the company anticipate any new solvency requirements? How does the company intend to respond?	The analyst should get a sense of any potential changes to the capital structure to meet new regulatory requirements.
Has the company faced any extraordinary restrictions on the payment of dividends? When do they anticipate these will be lifted?	Should the analyst forecast a lower (or no) pay-out in the short-term? When should the analyst forecast (if at all) an increase in dividend payments?

Illustrative (not exhaustive) examples:

ESG-related financial impact matrix	Physical climate risk for property insurers	Demographic trend towards an ageing population
Time horizon	Primarily long-term	Short-term and long-term
Revenue	May be able to charge higher premiums to compensate for additional risk.	Increased/new revenues from the sale of health or long-term care insurance to meet increased demand.
Opex	Incremental increase to integrate climate risk data into risk modelling, assess on ongoing basis.	--
Capex	--	--
Liabilities/provisions	Increased liabilities from floods, extreme weather. Insurer's ability to assess climate risk influences whether liabilities will be more/less than anticipated.	Liability increase driven by greater longevity for life insurers, as well as health insurers serving customers with greater health care needs. Risk modelling abilities determine net effect.

3.4 Industrials

The industrials sector encompasses a wide variety of companies – from capital goods manufacturers like Swedish Atlas Copco to transportation companies like Danish DSV Panalpina and industrial commercial and professional services firms like the Norwegian recycling and sorting company Tomra or the Finnish elevator and escalator manufacturer KONE. These companies typically compete in a global marketplace and have production facilities outside of their home markets.

Industrials vary in their exposure to market cycles, with those exposed to commodities or construction (e.g., manufacturers of mining equipment) highly sensitive to global economic conditions. For example, companies with significant service revenues (e.g., maintaining equipment throughout its useful life) are typically less cyclical than those that rely exclusively on manufacturing.⁵

From a valuation perspective, it is difficult to draw generalisations without mapping out the value chain for the specific company. For example, is the industry structure fragmented or concentrated? Is it characterized by large industrial conglomerates or specialised providers within a specific niche, such as door locks? Are there barriers to entry, such as access to unique technology that could justify super profits over time? How exposed is the company to the price of a particular raw material – either as an input in their production process or as a driver of demand, e.g., for producers of mining equipment. Regulation can also be a significant value driver, e.g., countrywide deposit return schemes for Tomra or energy efficiency regulations for the Swedish heat pump manufacturer NIBE Industrier.

Turning to the ESG-specific factors,⁶ *energy use and emissions* tend to be material for most companies within the sector. Energy use is likely to be a major cost for industrials, and access to stable energy sources is often critical for continuity in production processes. Key factors for the analyst to understand include the source and stability of the company's energy supply,

⁵ The Covid-19 pandemic is the most obvious exception, since social distancing restrictions complicated efforts to carry out even routine maintenance.

⁶ Based on the SASB standard for industrial machinery and goods (2018, The SASB Foundation, www.sasb.org).

as well as its exposure to carbon pricing regimes. In addition, industrial firms that manufacture technologies that reduce customers' emissions or consume resources more effectively may face significant tailwinds from the transition to a low carbon economy.

Potential questions for industrial companies:

Question	Implication
Does the company plan to invest in new energy capacity sources?	Should the analyst adjust capex expectations?
What is the company's exposure to national or regional carbon price regulation?	Should the analyst adjust forecasted costs given relevant market power and carbon price forecasts?

Health and safety statistics can also provide a useful indicator of operational excellence. Health and safety issues are material to sectors such as oil and gas and chemicals as well. Their relevance depends on the latent risk of the working environment (e.g., use of heavy equipment, handling of explosive materials, etc.) In contrast to many ESG data points, health and safety statistics, such as lost-time incident rate (LTIR), total recordable incident rate (TRIR), and near miss frequency rate (NMFR) follow a standardised format. The analyst should nevertheless check whether any deviations from peers derive from the population covered (e.g., whether contractors are included in the statistics). In our experience, examining outliers and trends over time can be helpful to gauge operational performance – particularly if the company discloses disaggregated figures.

In order to assess tail risk going forward, it can also be helpful to ask the company how they distribute information on incidents and near misses across the company to prevent future accidents, as well as trends in reporting of undesirable events (RUE). Perhaps somewhat paradoxically, a very low RUE level might indicate the company culture discourages reporting and is therefore less likely to learn of its mistakes.

Potential questions for industrial companies:

Question	Implication
What is the trend in company reporting of undesirable events?	Indication of potential tail risk – important to gauge whether company encourages reporting and has process in place to learn from RUEs.
What is the range of LTIF and RTIF values across production sites? How do these compare to site performance on operational metrics? Are the statistics different for contractors versus company employees?	Indication of potential tail risk as well as operational performance (e.g., ability to execute planned strategy).
What is the company's policy for shutdowns regarding poor health and safety metrics? When did a shutdown last occur?	Indication of potential tail risk. Note that the company's process for handling the risk may be more important than the existence of a recent shutdown itself.

Another potentially material ESG factor concerns the company's *materials sourcing*. Depending on the production process, the company may depend on access to a specific mineral that is geographically concentrated in areas subject to significant political risk. One example is cobalt – a key mineral for lithium-ion batteries – found primarily in the Democratic Republic of Congo. From the analyst's perspective, it is important to understand whether the company has policies and procedures in place to ensure continuous access to supply, as well as measures undertaken to mitigate the risk of association with labour rights violations, with the accompanying reputational effects.

Potential questions for industrial companies:

Question	Implication
What are the key materials on which the company depends and how does management identify and assess the risks associated with their use? ⁷	May suggest sources of cost volatility in acquiring key materials, as well as a potential risk of stalled production in the event they are not accessible.

⁷ The company's dependence on key materials is often included in the long list of risk factors included in any prospectus.

Question	Implication
Has the company faced supply disruptions in accessing these materials previously?	May suggest sources of cost volatility in acquiring key materials, as well as a potential risk of stalled production in the event they are not accessible.

In general, the risk of *corruption* tends to be highest in industries involving large contracts with public entities, particularly for contracts with authorities in countries with weak governance. For subsectors within capital goods such as aerospace and defence, anticorruption is a key ESG-related risk.

Potential questions for industrial companies:

Question	Implication
What is the company's exposure to anticorruption regulation such as the US Foreign Corrupt Practices Act or the UK Bribery Act? Has the company been sanctioned for corruption violations previously?	Suggests tail risk of substantial fines, particularly for companies with previous violations.
To what extent does the company rely on sales agents versus own employees for entering contracts in high-risk jurisdictions?	Use of agents typically carries a higher risk as they are more difficult to monitor than employees.

Illustrative (not exhaustive) examples:

ESG-related financial impact matrix	Corruption	Safety-related incidents	Energy use and emissions
Time horizon	Short-term and long-term	Long-term (tail risk)	Short and long-term
P&L effects			
Revenue	Risk of disbarment from future contracts (e.g., with public entities).	Work stoppages, difficulty attracting qualified employees.	--

ESG-related financial impact matrix	Corruption	Safety-related incidents	Energy use and emissions
Time horizon	Short-term and long-term	Long-term (tail risk)	Short and long-term
Opex	Cost of implementing compliance measures, e.g., hiring staff.	--	Lower/higher energy costs based on price differential relative to more (less) carbon intensive fuel sources, cost of necessary emissions permits (e.g., EU ETS).
Capex	--	Investments to replace destroyed/damaged equipment.	Investments in new technologies, equipment to reduce emissions e.g., to comply with emerging regulation.
Balance sheet effects			
Liabilities/provisions	Fines/litigation	Employee-related claims, fines/litigation	--

3.5 Metals and mining

The metals and mining industries are in a unique position in relation to the transition to a low carbon economy as they are both emissions intensive and enablers of low-carbon technologies, such as battery electric vehicles. Nordic companies in these sectors include the Swedish mining firm Boliden, steel producers such as Swedish SSAB and Finnish Outokumpu, and Norwegian aluminium producer Norsk Hydro. Both metals and mining are highly cyclical, with demand driven primarily

by GDP growth in key markets such as China. Minerals and metals are commodities subject to global prices. Individual company cost bases, in turn, depend largely on the unique features of each production site, e.g., access to raw materials.

Operational leverage is essential for the long-term sustainability of mining companies. Mines often operate at close to 100% capacity utilisation to minimise project payback time. Operational risks tend to be reflected in financial metrics. This is particularly relevant if the company has a concentrated asset base and more than 50% of operating assets are exposed to risky geographies or conflict areas, or over 50% of revenues stem from one given commodity, mineral or metal.

Sensitivity to environmental labour, social and regulatory costs will impact operational leverage in the long-run with a differing degree of materiality across the sector. Long-term challenges stem from:

- Declining commodity spot prices and a large portion of un-hedged revenues.
- Increased cash costs driven by inflationary pressures on operational costs, including labour and environmental costs (challenging physical lay-out of sites on remaining accessible deposits, increased labour costs and labour conflicts), and positioning on the cost curve.
- Declining ore grades resulting in operational complexity, including dealing with large waste volumes and low resource efficiency.
- Natural capital and energy scarcity in a number of geographies, resulting in increased regulation to prevent resource depletion (e.g., water scarcity).
- Increased pressure from downstream industries requiring detailed reporting on raw material sourcing, e.g., Dodd Frank Act provisions on conflict minerals.

The analyst should consider relevant mines, including mine design, operations and processing technologies, as well as mining regulations in the different jurisdictions. Mines should be prioritised by contribution to the company's Net Asset Value.

Potential material sustainability factors:

- Resource efficiency, such as water usage and energy consumption, will minimise costs and reduce the risk of operational disruption. The cost of using carbon intensive energy could increase if the cost of carbon increases.
- Physical risks of climate change: Extreme weather conditions, such as rainfall resulting in flooding can entail dramatic consequences for the mine site, including stop in operations, or at worst asset stranding.
- Environment: Good environmental management can reduce remediation costs and potential future liabilities.
- Water risk (Columbia University, 2017)
 - Water scarcity – leading to need for additional investments (e.g., desalination plant) or potential work stoppages, social conflict due to community water shortages
 - Excess water – tailings dams failure (e.g., Mariana, Brumadinho)
 - Water pollution – can be particularly challenging with cumulative pollution, with accompanying operational risk for the whole industry (Columbia University, 2017) (e.g., Mariana dam collapse in region with 100+ years of mining activity). Baseline values may not be available, and companies usually only look at own discharge.
- Communities: Mining companies' license to operate relies on their relation to local communities. Health and safety issues, as well as labour practices, including through sub-contractors, will be essential to maintain good relations with local communities.
- Alignment of management incentives: Mining projects tend to extend over 20 years, which exceeds the average CEO tenure. Focus on short-term project profitability could entail greater risk for higher liabilities at the end of the project if environmental management is neglected for short-term profitability.

The site or operations level research will be balanced against a consolidated analysis of the company's general policies and practices related to sector peers.

Other relevant factors to consider include litigation provisions, closure provisions, decommissioning provisions, access to labour and labour conditions, share of subcontracted versus own labour, and energy costs (grid access or not, fuel mix, and climate risk).

Potential questions for metals and mining companies:

Question	Implication
How much do you spend on environmental matters, in terms of expenses and capital expenditures?	This is to evaluate the focus on environmental design of each project to minimise long term environmental impact and potentially avoid tail risks.
What percentage of your operations are certified according to an environmental management system? Do you have regular audits of your tailings dams?	Certified EMS requires a regular review of mine sites and objective assessments. This helps ensure process consistency across sites, which should reduce the risk of failure. Tailings dams must be reviewed regularly to minimise the probability of potential failure. This is particularly important if the project life has been extended and the capacity of tailings dams increased through limited retrofitting.
How does the company account for remediation costs?	Remediation costs should be accounted for properly but are often underestimated. Provisions should be compared to actual mine closure costs at comparable sites. This would help assess potential liabilities versus current insurance coverage.
What percentage of water is recycled or reused? Do you quantify the cost of water in your operations?	Mining operations are water intensive. Water costs are particularly important in water scarce areas. Restrictive measures can be applied by local authorities, forcing companies to recycle water or find alternative water sources. This question is designed to gauge the potential impact on opex and capex.

Question	Implication
What are your energy sources (on/off grid), energy mix and your plans to improve energy efficiency?	This is to evaluate the impact of potential power outage on the operations, independence of energy supply and carbon intensity.
How do you consider risks and opportunities related to climate change? Is this discussed at the board level?	The energy intensity of mining operations as well as transportation of metals and minerals can generate a significant carbon footprint. This question will help gauge readiness to transition to a lower carbon economy as well as the impact of physical risks on different mine sites. This should help develop different scenarios, as well as assess potential tail risk (for example, related to extreme weather events).
Does your company have a local procurement plan?	License to operate will depend on the ability to engage local stakeholders and contribute to local economies.
How do you invest in host community development? What percentage of workers are from local communities?	Community engagement is key to maintain the license to operate.
How do you ensure that economic development will be sustainable locally when the mine operations are terminated?	This is to evaluate risks related post closure and understand what has been included in the mine closure plans.
Do you report taxes and royalties paid on a project or country basis?	Royalties and taxes are a significant contribution to local economic development and should be transparent to avoid corruption. This is an important factor to understand for cash flow projections.
What percentage of employees receive training on health and safety?	Zero tolerance policy should be supported by continuous training on health and safety.
Do you verify that contractors work to the same standards required of your own employees? What actions are taken when there is a breach of the company's health and safety procedures?	Extensive use of sub-contracting without minimum standards can be a source of social conflict and human rights issues. This will help gauge potential social tail risks.

Illustrative (not exhaustive) examples of sustainability risks for mining companies:

ESG financial impact matrix	Water scarcity <i>ref. NBIM research project</i> : (Columbia University, 2017) Human rights, community Labour practices	Flooding	Climate change Environmental impact
Time Horizon	Short-term and long-term	Short-term and long-term	Long-term
P&L Effects			
Revenue	Permitting delays and lost production	Production stoppage or curtailment	Fundamental commodity price/supply
Costs	Monitoring and social costs Taxes and Royalties	Monitoring pollution and remediation	Fundamental cost of water
Capex	Desalinisation, re-use Infrastructure for local communities	Clean-up and reconstitution	New technologies, substitution
Balance sheet effects			
Liabilities/provisions	--	Asset impairment (for example, tailings dams collapse)	Potential liabilities for reclamation if insufficient provisioning

3.6 Health care

The Nordic health care sector includes pharmaceutical companies, such as the largest listed firm on the Danish stock exchange, Novo Nordisk, as well as medical equipment and supply industries, like Coloplast and Getinge.

From a valuation perspective, the two key factors for analysing pharmaceutical firms are: 1) the *existing product portfolio*, and 2) the *product pipeline*. Pharmaceutical firms typically invest heavily in R&D to produce new products and receive patent protection for a limited time when a drug first comes to market. Companies earn super profits during the life of the patent as the regulator in effect grants the company a time-limited monopoly to incentivise drug development. Once the regulator allows generic development, the drug becomes a commodity. As a result, the critical questions for evaluating the existing portfolio are how long patent protection will last and how much sales will grow before that date. The second factor, the product pipeline, refers to the company's drugs under development. The analyst values the pipeline by assessing the probability that the various products will gain regulatory approval and the potential market size of each. For early-stage firms with a single product under development, the entire valuation will depend on the pipeline.

The assessment is similar for medical equipment and supplies, depending on the level of innovation within each product category. For example, valuations for companies that produce relatively standard hospital equipment or supplies are likely to be driven by margins and volume, as patent protection and product pipelines are not typically relevant.

It is not difficult to find examples of ESG-related events that have had an immediate, significant negative impact on stock prices (e.g., from a major product recall). It is more challenging to identify the effect *ex ante*. In our experience, an analysis of the ESG risk factors can nevertheless help in identifying what might go wrong and thereby, suggesting the level of confidence the analyst should have in her valuation.

Turning to specific ESG issues, although *environmental* factors are not commonly material to the health sector, counterexamples exist. In 2013, Norwegian environmental authorities ordered the then-listed Norwegian pharmaceutical firm Weifa to shut down one of its factories after failing to obtain a permit for discharging pharmaceutical waste into a nearby fjord (Nilsen, 2014). Another example of a potentially material environmental issue concerns new regulatory requirements for the materials used in medical equipment, e.g., the incremental cost of phasing out certain types

of plastics. Nevertheless, social factors tend to predominate material ESG issues for the health sector.

Concerns around *access to medicine*, affecting both drug pricing and market access, are a major ESG issue for pharmaceutical companies. Regulators grant companies patent protection to encourage socially valuable drug development. Companies perceived to violate this implicit social contract risk inciting a regulatory response. Perhaps the most flagrant example involves lawsuits and public outrage in the US over a pharmaceutical firm that purchased the only FDA-approved drug for a rare but potentially deadly disease and increased the price 5,000% overnight (Kang, 2020). That is an extreme case, but price differentials across geographic markets, e.g., between Europe and the United States, can be substantial. Company-led affordability initiatives (e.g., pharmaceutical donations to individuals without insurance to cover the drug's cost) may be at least in part designed to offset latent regulatory risk by proactively contributing to society. Potential regulatory responses include requirements for public health systems to buy generic products or directly or indirectly regulating drug pricing (e.g., through public insurance coverage).

Potential questions for health care companies:

Question	Implication
What are the company's main geographic markets?	Indication of the company's regulatory exposure (and associated costs or necessary investments to meet requirements), as well as exposure to market trends and stakeholder pressures (e.g., drug pricing debates in the United States).
Are there any regulatory proposals to limit pharmaceutical prices or market access in these regions? What is the company's strategy to address this?	Top-line implication for market access, as well as cost implications from strategy to address any pricing pressure. Tail-risk from compliance concerns may also be relevant (e.g., running afoul of lobbying restrictions).

Patient safety is a key issue for pharmaceutical companies – both during clinical trials, before a drug gains regulatory approval, and once the drug has entered the marketplace. Moreover, regulators (for example, the US Food and Drug Administration, or FDA) impose stringent requirements on *product safety*. The costs of poor safety include harm to human life and health, with the accompanying product recalls and litigation.

Potential questions for health care companies:

Question	Implication
Does the company currently face legal proceedings relating to patient safety? Are any of the company's products subject to recalls or FDA enforcement actions? To what extent is the company insured against product defects?	Immediate revenue implications for products withdrawn from the market, as well as costs of potential litigation and fines. Some of these costs may be covered by insurance, depending on the severity of the incident.
How have any legal actions affected company strategy going forward – if at all?	Risk of loss of market access, end consumer demand from withdrawn products, reputational effects.

Another potentially material ESG issue for pharmaceutical companies involves *business ethics* – both anticorruption and ethical marketing. The companies often negotiate large contracts with public entities, a high-risk activity from a corruption perspective. There are several examples of pharmaceutical companies forced to pay substantial fines for bribing officials to grant market access. Ethical marketing is another potential concern. The opioid litigation in the United States is perhaps the clearest example of the potential negative impact from unethical marketing. The lawsuits in questions concern the pharmaceutical companies' role in withholding information about the addictive and dangerous nature of their product.

Potential questions for health care companies:

Question	Implication
Is the company subject to any corruption-related investigations?	Costs of litigation, management time and attention, as well as tail risk from adverse legal outcomes (e.g., 2020 Novartis settlement with the US Department of Justice).
Is the company subject to any complaints or litigation related to its marketing practices?	May indicate increased costs from litigation, including management time and attention, as well as tail risk from adverse legal outcomes.

An emerging risk for the health sector is *data security and patient privacy*. As the suite of digitalised medical products increases, e.g., through IoT (internet of things) technology, the need for data security to protect sensitive patient health information becomes imperative. Failure to do so could risk a loss of customers and expose companies to lawsuits.

Potential questions for health care companies:

Question	Implication
Which of the company's products store sensitive user health information? What steps has the company taken to ensure this data remains secure?	May indicate tail risk for fines from e.g., EU General Data Protection Regulation (GDPR) violations
How does the company use patient data?	From a revenue perspective, innovative use of patient data may create better products and services, allowing the company to grow market share. However, the analyst will want to gauge whether the company appears to have the necessary routines and procedures in place to minimise the risk of fines and reputational damage from patient privacy violations.

Illustrative (not exhaustive) examples:

ESG-related financial impact matrix	Affordability initiatives	Drug pricing regulation	Product safety, data privacy, and business ethics/corruption	Environmental regulation
Time horizon	Short-term and long-term	Short-term and long-term	Short-term and long-term	Short-term and long-term
P&L effects				
Revenue	Market access, incremental revenue from uninsured customers	Pricing pressure	Risk of losing market access, reduced customer demand and reputational damage	--
Opex	Cost of program, potential tax deduction for charitable donations	--	--	Increased costs for e.g., more expensive inputs
Capex	--	--	--	Increased investments in e.g., wastewater treatment equipment
Balance sheet effects				
Liabilities/provisions	--	--	Fines/litigation related to non-compliance	Fines/litigation related to non-compliance