

Assessing climate risk in equity investing

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IN BRIEF

- In evaluating climate risk in a potential equity investment, we consider both the physical aspects of climate change and the implications of the ongoing energy transition to a low carbon economy.
- Our analysis includes three key components: materiality, governance and disclosure.
- We look beyond carbon footprint metrics. Two companies with an identical carbon footprint today can have completely different strategies for managing emissions in the future.
- Several case studies illustrate how we assess climate risk and identify climate change opportunities in equity investment.

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AS A LONG-TERM ACTIVE INVESTOR, WE LOOK TO WEIGH ALL THE FACTORS THAT COULD IMPACT A COMPANY'S FUTURE CASH FLOW AND SUSTAINABLE VALUE. As part of that process, we aim to identify companies that are well positioned to manage the investment risks and opportunities associated with climate change, noting that environmental policies and practices can impact financial performance in both the medium and long term. Climate change is an important consideration as we try to generate the best possible risk-adjusted returns that align with our clients' objectives.

We take an integrated, proprietary, research-driven approach to evaluating climate risk. We incorporate environmental, social and governance (ESG) factors in our research where material, and this informs the way we construct our portfolios. In the following pages, we explore how we assess and evaluate climate risk in a potential equity investment, considering both the physical aspects of climate change and the implications of the ongoing energy transition—the transformation of the global energy mix from a fossil fuel to a zero/low carbon energy source. We engage regularly with the companies in which we invest—it is central to our investment process—as we continually reassess their climate risk exposure. Several case studies illustrate our perspective on climate risk analysis in equity investment.

OUR FOCUS

Our climate risk analysis examines a wide range of factors. These three components are key: materiality, governance and disclosure.

Materiality

We begin with a basic question: Could a company's or an industry's ability to create sustained value over the long term be impacted by climate change?

Among the keys to identifying company leaders and laggards in managing climate risk:

- Asset profile, including whether a company is exposed to potentially declining demand for its products or services due to environmental considerations
- Capital deployment
- Cost structure, expected impact of potential carbon taxes and exposure to high fixed operating costs
- Existing and proposed regulatory requirements or formal guidance at the local, state and national levels
- Business model, to assess whether physical climate effects require material structural change
- Technological advances—for example, in fossil fuel extraction, energy efficiency and expected life of energy reserves

Governance

A company with the appropriate governance system in place to proactively identify, assess and manage climate risks and opportunities is likely to be equipped to face the physical and transitional impacts of climate change. Some of the factors we assess include:

- Board competence: Is the board prepared for energy transition?
- Strategy integration and framework: Are climate considerations part of strategy?
- Remuneration: Is there a link between compensation and environmental metrics?

Disclosure

We generally encourage a level of reporting that provides meaningful, standardized information without imposing undue burdens on a company. Among the factors we assess:

- The company's current level of disclosure and the consistency of disclosure across its industry
- Whether the company incorporates environmental issues in a risk-assessment or risk-reporting framework

CARBON FOOTPRINT AND THE MEASUREMENT OF RISK EXPOSURE

We ask two fundamental questions: "Where does the company stand now?" and "What is the company doing for the future?"

Just as an investor would not buy or sell a stock based only on a single financial metric, considering and understanding multiple factors is essential to fully comprehending climate risk.

We note that environmental data is largely self-reported and a simple apples-to-apples comparison on a single metric (e.g., water consumption, carbon emissions) is not sufficient to assess a company's exposure to climate risk. This is because:

- A single indicator can easily be skewed to a more desirable format, as in most cases the data are not audited.
- Some events (e.g., extreme weather) are beyond a company's control.
- Different sectors have different dynamics of environmental impact.

The most common way to measure the climate risk exposure of a company is to understand the level of carbon output. In addition to the portfolio-level carbon analyses, we disaggregate portfolios at the sector level and stock level to understand the specific contribution to carbon emissions.

In the MSCI World Index, for example, the utility sector accounts for 47% of carbon intensity and 38% of total carbon emissions. Almost two-thirds of the carbon intensity and emissions come from the utilities, oil and gas, chemicals, construction and mining sectors.

EXHIBIT 1 highlights the 10 most carbon-intensive stocks of a sample portfolio. Emissions are concentrated in the utilities, materials and energy sectors. An explicit goal of minimizing carbon intensity in a portfolio will have serious implications for sector positioning.

Higher emissions are concentrated in the utilities, materials and energy sectors

EXHIBIT 1: PORTFOLIO ISSUERS WITH HIGHEST CARBON INTENSITY

Rank	Company	Sector
1	XCEL ENERGY INC.	Utilities
2	NEXTERA ENERGY, INC.	Utilities
3	ARCELORMITTAL S.A.	Materials
4	ENEL SPA	Utilities
5	TRANSCANADA CORPORATION	Energy
6	NORSK HYDRO ASA	Materials
7	CRH PLC	Materials
8	IBERDROLA, S.A.	Utilities
9	RIO TINTO PLC	Materials
10	DOWDUPONT INC.	Materials

Source: MSCI, J.P. Morgan Asset Management; data as of February 2019.

Case study: Xcel

While a company’s carbon footprint is an important element in assessing climate risk, it needs to be reviewed in combination with the strategic initiatives the company is undertaking to manage any negative environmental impacts.

In the sample portfolio table, the company with the highest carbon intensity is Xcel Energy, a regulated utility with operations in Minnesota, Colorado, Texas and New Mexico. Currently, Xcel Energy ranks poorly in carbon emissions, but the company is in the process of dramatically reducing the amount of power that it generates using coal. Over the next three years, Xcel Energy is building over 3,500 megawatts (MWs) of new wind generation, which has already been approved by state regulators. It has targeted an 80% reduction in carbon emissions by 2030. In sum, Xcel Energy is choosing an environmentally responsible path, while targeting EPS growth of 5% to 6% per year and dividend growth of 5% to 7% per year. The company has a strong credit rating and good growth prospects as it continues to shift its power generation portfolio as the cost of renewable energy rapidly declines.

EXHIBIT 2 provides a breakdown of Xcel Energy’s regulated rate base, upon which it earns a return from different asset types. Coal generation accounted for 10% of the regulated rate base in 2018 and is expected to decline to 5% by 2024.

Fossil fuel reserves

Fossil fuel reserves (i.e., thermal coal, oil and gas) can also represent carbon risk as future carbon emissions. With the rising pressure of decarbonization and energy transition, companies that own untapped fossil fuel reserves may be exposed to stranded asset risk. Reducing the portfolio stake of a company that is overly reliant on fossil fuels vs. its peers or benchmark can be one way to manage the environmental footprint of a portfolio.

Coal generation accounted for 10% of Xcel’s rate base in 2018 and is expected to decline to 5% by 2024

EXHIBIT 2A: XCEL 2018 YEAR-END RATE BASE

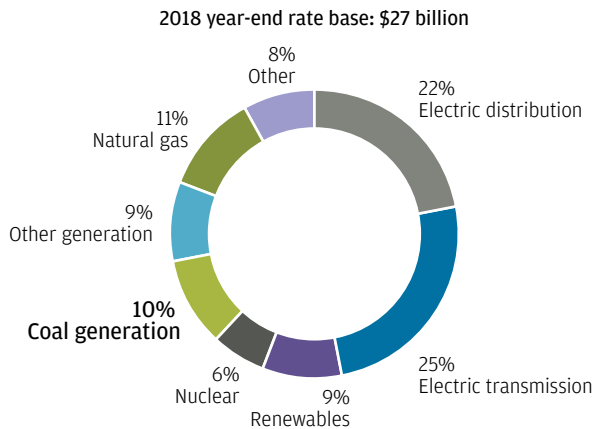
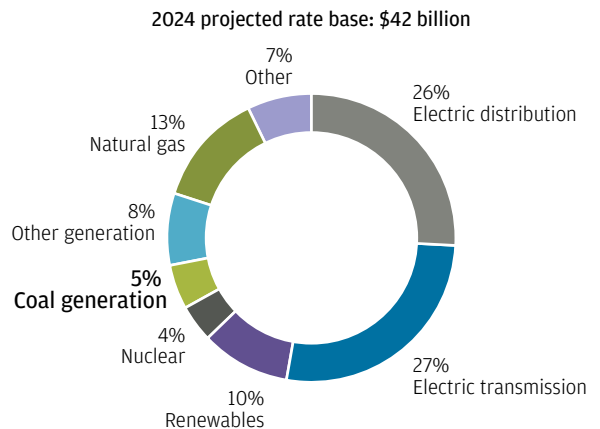


EXHIBIT 2B: XCEL 2024 PROJECTED RATE BASE



Source: Xcel Energy, J.P. Morgan Asset Management; data as of November 2019.

Future focus: Beyond carbon footprints

Two companies with an identical carbon footprint today can have completely different strategies for managing emissions in the future. While the carbon footprint helps investors understand a portfolio's exposure to climate risk, it is a static measurement that looks backward, not forward. A company may face significant shifts in its business opportunities and risks irrespective of its current carbon footprint. We take a forward-looking view of a company's potential response to environmental concerns by looking at indicators such as its:

- Three-year greenhouse gas (GHG) emissions trend
- Environmental targets such as GHG reduction and energy efficiency metrics
- Programs and initiatives to reach targeted goals
- Alignment of environmental reporting to the Task Force on Climate-Related Financial Disclosures (TCFD) framework

THE OIL AND GAS INDUSTRY: A PILLAR OF THE ENERGY TRANSITION

According to the International Energy Agency (IEA), the energy sector is responsible for two-thirds of global greenhouse gas emissions. We believe that the oil and gas industry can provide solutions to address the challenges posed by climate change. Some companies have been shifting toward cleaner energy for some time; a number have invested in renewable energy and electric vehicle charging points, while others have focused on developing cleaner fuels. To achieve the goals of the Paris Agreement, these efforts will need to be complemented by technologies such as forest management and carbon capture and storage (CCS), a technology that could lead to a 14% reduction in greenhouse gas emissions by 2050, according to the International Energy Agency. Through engagement, we seek to support companies that are leading the way forward, while encouraging laggards to effectively plan for the energy transition.

Case study: Total

Total has been a leader in the transition to a low carbon economy. The core of the company's strategy: decreasing its reliance on oil, increasing the share of gas as a transition energy and investing in renewables and low carbon businesses. To that end, in 2011 Total acquired a 60% stake in SunPower, a solar panel manufacturer, and in 2016 it took control of Saft, a company that provides battery solutions for a broad range of

industries. Total is also committing 10% of its R&D budget to CCS. We engage with Total to support its business model evolution while monitoring progress on its strategy.

Case study: Repsol

Repsol, the Spanish oil major that also operates fuel stations, is one of the companies that has begun to prepare for a global shift in the dynamics of energy consumption.

We have engaged regularly with Repsol over the last several years. Following the company's sustainability day in late 2017, we felt that the firm's strategic focus on energy efficiency was insufficient and its internal carbon price for new projects too low, fixed at USD10/t (below its peers) and set to progressively increase to USD40/t by 2025.

In 2018, Repsol presented "thriving in the energy transition" as a key pillar of its strategy update. The company aims to become a multi-energy provider, investing in renewables as well as the electricity supply chain, such as charging points and batteries for electric vehicles. In addition, its internal carbon price was revised upward to USD25/t. We believe shareholder engagement played an important part in the development of Repsol's decision to bolster its business model to better transition to a low carbon economy.

Going forward, we expect to see Repsol further strengthen its business model, shifting its capital allocation plans for renewables and raising its targets for carbon reduction.

PHYSICAL RISKS OF WATER SCARCITY

Companies that are heavily dependent on "natural capital," such as palm oil, water, forest and fossil fuels, are likely to be less resilient to climate risk. Companies that generate more sales with less carbon, water and waste will be more resilient to climate risk as they deploy resources more efficiently.

The risk of water scarcity is profound. A 2016 report by the American Association for the Advancement of Science estimated that two-thirds of the global population is facing water scarcity. Improving water-use efficiency is critical for industries that rely heavily on water.

Case study: Anglo American

The mining sector consumes vast quantities of water, often in remote regions where water is scarce. Globally, almost 80% of

the copper produced by major mines is in water-challenged regions. For Anglo American, 75% of its current portfolio is located in regions at high risk of water scarcity. For the short and medium term, the company has set ambitious targets to reduce its water consumption: By 2020, it aims to decrease freshwater intake by 20%, and 75% of the water it uses should be recycled or reused. Anglo American is also focusing on recovering water from tailings dams, which represent the largest water loss in mining.

Case study: Data centers

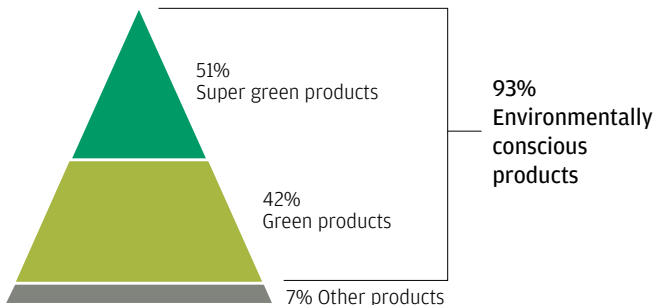
A seemingly insatiable appetite for data is spurring rapid growth of data centers. This puts pressure on water resources in two ways:

- Directly, through the use of water-cooled chiller systems designed to prevent machines from overheating
- Indirectly, through power usage

Typically, a data center will use 7 million to 8 million gallons of water per year per megawatt of electricity used, primarily for heat reduction. Of the five largest data center markets in the U.S., four (Northern Virginia, Dallas, Chicago and Silicon Valley) are located in areas designated as having a high or medium-high risk of water scarcity. Going forward, water usage restrictions through drought or regulation could result in greater data center downtime and also limit the ability for data centers to expand. Not surprisingly, data centers are looking to reduce their direct and indirect water footprints through alternatives to water-cooled chiller systems and the use of renewable energies for power generation. For example, Microsoft is using seawater cooling in its underwater data center off the coast of the Orkney Islands in Scotland, and Facebook is trying out a new indirect evaporative cooling system in some of its data centers.

More than 93% of Daikin’s residential air-conditioning products sold in 2018 were energy efficient

EXHIBIT 3: ENVIRONMENTALLY CONSCIOUS PRODUCTS AS PERCENTAGE OF NET SALES (RESIDENTIAL AIR CONDITIONERS)



OPPORTUNITIES FOR CLEAN TECHNOLOGY

Exposure to alternative energy, green buildings, energy-efficiency techniques and other innovations, such as cleaner chemicals, new wastewater treatments and energy storage, are also assessed to determine carbon offsets and opportunities.

Case study: Daikin

Daikin, a Japanese manufacturing company that produces ventilation, refrigeration and air conditioning, is a good example of a company with clean technology opportunities. Typically, half of a building’s energy consumption comes from air-conditioning (AC) units—hence, making AC systems more efficient is one of the single most effective ways to reduce the amount of GHG emissions.

Daikin’s energy-efficient AC products reduce both GHG emissions and customers’ energy bills. As a result, 83% of Daikin’s residential AC products sold in 2017 were energy efficient (EXHIBIT 3).

CONCLUSION

The investment implications of climate risk are multi-faceted and complex. No single metric or framework can begin to capture all the interconnected issues or identify the full range of a company’s vulnerabilities and strengths. This is why our fundamental research analysts, portfolio managers and investment stewardship specialists collaborate to conduct climate risk analysis through ongoing engagements with the companies in which we invest. Our ultimate goal: to invest in companies that are well positioned to manage the physical and transition risks and opportunities associated with climate change.

Environmentally conscious products: A product that satisfies all of the conditions listed below is a **super green product**; one that satisfies at least one of the conditions is a **green product**.

- Consumes at least 30% less electricity than conventional products
Example: Air conditioners equipped with inverters
- Uses refrigerants with at least two-thirds less global warming potential impact than conventional refrigerants
Example: Air conditioners using R-32, a refrigerant with lower global warming impact

Source: Daikin Sustainability Report; data as of March 2019.

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