



Grading Exxon's First Climate Risk Assessment

Greg Rogers March 15, 2018

In this article, we grade Exxon's landmark [2018 Energy and Carbon Summary](#) for the purpose of informing senior management and boards of *other companies* on the emerging discipline of *climate-related financial disclosure*. This article is specifically intended for those with managerial or oversight responsibility for external corporate communications on the financial impacts of climate change, but may also be of interest to investment professionals specializing in ESG (environmental, social and governance), responsible investment, and stewardship.

Exxon's maiden climate risk assessment is well written and beautifully presented. However, skeptical readers may ask whether the report is a milestone in corporate disclosure or a finely crafted public relations piece designed to deflect criticism and placate investors.

Our aim is to critically evaluate Exxon's report and not the company. We do not wish to pass judgment on Exxon, its management, or the company's climate strategy. We acknowledge that this is merely the first of many such reports that Exxon and others will prepare in the future. Our goal is to evaluate Exxon's effort in order to improve the quality of climate-related financial disclosure over time.

We have organized our review into four sections. We start with a summary of our scoring criteria and results to help readers understand our overall perspective before getting into the details. Next we review the unusual circumstances causing Exxon to publish its first climate risk assessment, followed by a brief explanation of how recent developments have shaped our understanding of the proper aims of such communications. We then evaluate how the Exxon report stacks up against these objectives.

Summary

At the outset, to grade Exxon's effort one needs a scorecard with "par" clearly indicated for each "hole played". In other words, what are the criteria by which investors and other stakeholders should judge this report and others like it?

We start with our view that investors' concern about the effects of climate change is driving the convergence of three historically distinct corporate management responsibilities — strategic planning, financial reporting, and public relations — into what is now becoming known as "climate-related *financial disclosure*." We then evaluate Exxon's climate report based on whether it effectively achieves key objectives in each of these three areas.

As there are no generally accepted criteria for scoring performance in this new form of corporate communications, we had to develop criteria that will be applicable to most companies. The following table shows the yardsticks we chose. We tailored the public relations objective slightly to fit Exxon's specific situation as a major oil company, emphasizing the risks to the company from lawsuits and the energy transition to a low-carbon economy over the physical risks resulting from climate change. For other companies, physical risks might be equally or more important than transition and legal risks.

Objective	Key Scoring Criteria
Strategic planning	Does the report demonstrate that management is undertaking the appropriate steps to build and maintain a climate-resilient business model?
Financial reporting	Does the report provide decision-useful analysis of potential future climate-related financial impacts?
Public relations	Does the report build confidence in the company's ability to mitigate legal risks and create shareholder value throughout the transition to a low carbon economy?

Using a four-point grading scale — **E** (Excellent), **S** (Satisfactory), **NI** (needs improvement) and **U** (unsatisfactory) — we evaluated the degree to which the report satisfied these criteria. We summarize our findings in the table below.

Objective	Strengths	Weaknesses	Grade
Strategic planning	Describes capabilities and actions to mitigate climate-related physical and transition risks	Does not provide evidence of management's ability to evaluate a full range of plausible scenarios in order to determine an optimal strategy; does not report on planning beyond 2040 in its base case; fails to stress test against full implementation of the Paris Agreement	U
Financial reporting	Addresses potential climate-related financial impacts on existing petroleum resources and offers justification for future investments in new resources	Omits detailed quantitative analysis of climate-related impacts on existing and future petroleum reserves and discussion of asset retirement obligations	U
Public relations	Acknowledges climate-related financial risks	Deviates from shareholder expectations for a "globally agreed" 2°C scenario and fails to clearly and prominently disclose key assumptions and uncertainties	NI

The Setting

Our evaluation of Exxon's climate risk assessment starts with recognition of the highly unfavorable public relations setting that gave rise to its publication.

Last year, the New York State Common Retirement Fund and the Church of England co-filed a [shareholder resolution](#) requesting that the company analyze how worldwide efforts to adopt the Paris Agreement goals for reducing global warming might impact its business. The resolution stated:

RESOLVED: Shareholders request that, beginning in 2018, ExxonMobil publish an annual assessment of the long-term portfolio impacts of technological advances and global climate change policies, at reasonable cost and omitting proprietary information. The assessment can be incorporated into existing reporting and should analyze the impacts on ExxonMobil's oil and gas reserves and resources under a scenario in which reduction in demand results from carbon restrictions and related rules or commitments adopted by governments ***consistent with the globally agreed upon 2 degree target.*** This reporting should assess the resilience of the company's full portfolio of reserves and resources ***through 2040 and beyond,*** and address the financial risks associated with such a scenario. [Emphasis added]

At the company's 2017 annual meeting in Dallas, [investors with 62.3 percent of shares voted to approve the resolution on climate disclosure over the objections of Exxon's management and the board](#). In December 2017, the company [notified the Securities Exchange Commission \(SEC\)](#) and issued a letter to the New York Director of Corporate Governance stating:

Consistent with ExxonMobil's *Corporate Governance Guidelines*, the Company's Board of Directors has reconsidered the proposal requesting a report on impacts of climate change policies that the New York State Common Retirement Fund submitted for the 2017 Annual Shareholders Meeting. In reconsidering the proposal, the Company sought input from a number of parties, such as the proponents and major shareholders. As such, the Board has decided to further enhance the Company's disclosures consistent with the proposal and will seek to issue these disclosures in the near future. These enhancements will include energy demand sensitivities, implications of two degree Celsius scenarios, and positioning for a lower-carbon future.

Three other ongoing developments give added context to the shareholder resolution. First, in January 2018, [New York City sued ExxonMobil](#) and the world's four next largest publicly traded oil companies, seeking to hold them responsible for present and future damage to the city from climate change. The suit claimed that BP, Chevron, Conoco-Phillips, ExxonMobil and Royal Dutch Shell together had produced 11 percent of all of global-warming gases through the oil and gas products they had sold over the years. It also charged that the companies and the industry they are part of had known for some time about the consequences but sought to obscure them. [Seven California cities and counties filed similar legal claims in 2017](#), demanding ExxonMobil and others pay billions to cover losses from rising seas. ExxonMobil recently filed a [counter claim](#), alleging that the California jurisdictions had conspired to vilify and taunt the oil industry.

Second, [New York's attorney general has alleged that Exxon may have misled investors](#) about how it accounts for the impact of climate change on its operations by using internal estimates that differed from its public statements. In June last year, Eric Schneiderman claimed he had evidence showing that Exxon's process for estimating the potential future costs of greenhouse gas regulations on its business "may be a sham."

In 2015, after having identified climate change as a potential systemic risk to global financial stability, G20 Finance Ministers and Central Bank Governors asked the Financial Stability Board (FSB) to review how the financial sector could take account of climate-related issues. This led to the formation of the Taskforce on Climate-related Financial Disclosures (TCFD), which was tasked with developing a framework of financial disclosures that “would enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system’s exposures to climate-related risks.” Using these climate-related financial disclosures, the FSB envisioned that:

[F]inancial institutions and other relevant stakeholders could then assess the credibility of firms’ transition plans and their ability to execute them, and analyze the potential changes in value of their assets and liabilities that could result from a transition to a lower carbon economy or to other climate-related events (e.g. physical or legal risks). This would allow stakeholders not only to manage and price these risks accordingly but also, if they wish, to take lending or investment decisions based on their view of transition scenarios. [Emphasis added]

The TCFD’s final report issued in July 2017 recommended a sweeping new climate disclosure framework covering governance, risk management, strategy and performance metrics and targets. Significantly, it recommended that preparers include this information in their annual financial reports instead of (or in addition to) other locations in order to improve credibility with investors and foster shareholder engagement.

Convergence

The TCFD’s recommendations have shaped our view that climate change is driving the convergence of strategic planning, financial reporting, and public relations. Let us explain.

Convergence of public relations and financial reporting

Public relations and financial reporting are converging. Historically, corporations have provided voluntary climate-related disclosures to achieve public relations objectives. Large corporations are accustomed to publishing voluntary reports touting their ESG bona fides. A typical ESG report costs less than \$25,000, making ESG reporting a cost-effective public relations opportunity to influence ESG ratings providers and asset managers offering ESG financial products. Unlike financial disclosure, ESG disclosure is most often voluntary and free from independent audit and internal control requirements. Management has complete discretion, and the motivation to selectively disclose is strong.

The term “climate-related *financial* disclosure” itself implies that henceforth climate-related disclosures will be seen as financial in nature, even though they may not be reflected as line items in the financial statements. The TCFD further emphasized this point by recommending that financial statement preparers include such disclosures in their annual financial reports. Going forward, management will need to temper its PR-inspired motivation to selectively disclose with the legal duty to “fairly present”. Public relations and financial reporting objectives and responsibilities now overlap.

Convergence of strategic planning and financial reporting

Strategic planning and financial reporting are also converging. The need identified by the FSB for investors to “assess the credibility of firms’ transition plans and their ability to execute them”

requires new forms of financial analysis and disclosure based on future expectations rather than historical experience.

Since the enactment of the U.S. Securities Exchange Act of 1934, financial reporting and securities analysis based upon such reporting have not fundamentally changed in the sense that the focus has largely remained on historical data compiled in accordance with generally accepted accounting principles, supplemented by management's *near-term* financial projections.

Until the early 1970s, the SEC banned disclosure of forward-looking information, based primarily on the perception that such information was inherently unreliable, and that unsophisticated investors would place undue emphasis on such information in making investment decisions. Corporate managers also opposed forward-looking disclosures out of concern that predictions or statements of opinion could be considered to be "facts" which later could be said to be false or misleading for purposes of liability under the securities laws. The SEC now allows properly caveated forward-looking disclosures, and analysts report that they view management's own near-term performance projections to be critical to their own forecasts of a company's future performance.

Climate change has forced a reconsideration of whether backward-looking financial disclosures and near-term financial forecasts are sufficient to properly price stocks and bonds. Investment analysts are now developing tools to estimate potential future climate-related impacts to company profitability, cash flows, and capital expenditures that can then be used to feed financial analysts' discounted cash flow and other valuation models. Credit ratings agencies such as S&P Global are gearing up to use the same information to determine whether climate risks pose a material impact on credit worthiness.

Responding to the need for forward-looking disclosures that appropriately address the uncertain timing, probability and magnitude of climate risk, the TCFD's recommendations call for companies to "describe the resilience of the organization's strategy, taking into consideration a wide range of different climate-related scenarios, including a 2°C or lower scenario." As a guide for those unfamiliar with the methodology, the TCFD included a [technical supplement on the use of climate-related scenario analysis](#), which it describes as a means to better understand how a business might perform under different future states.

Scenario analysis is a component of what is now commonly known as "decision analysis," which refers to a systematic, quantitative and interactive approach to decision-making under conditions of uncertainty. The strategic planning departments of many large companies are accustomed to using decision analysis to inform strategy based on consideration of a broad range of uncertain future costs, prices, and growth, interest, and exchange rates. To assess their risk exposure and to price insurance policies, insurers and reinsurers routinely use stochastic scenario generation systems as a component of multi-period, multi-objective asset and liability planning, analysis and modeling of alternative management strategies (see, e.g., [Financial planning via multi-stage stochastic optimization](#)). Given the long time horizons and the uncertain nature, probability and magnitude of climate risk, decision analysis is a particularly useful, and we would argue a necessary, tool for building a climate-resilient strategy.

Corporations are exposed to some degree of climate risk whether they like it (or acknowledge it) or not. Management therefore has a responsibility to assess the organization's climate risk exposure and determine how to best manage it (mitigate it, transfer it, avoid it, accept it, or a combination of all or some of the four). This is nothing new. Climate risk is simply another aspect of enterprise risk management. What is new is the expectation that management should disclose the results of the organization's climate-related analysis and planning, including management's plans for execution of its preferred strategy.

Going forward, disclosure will be a critical consideration. If management uses climate-related decision analysis to inform corporate strategy, it should ask whether such analysis is *ipso facto* material to investors. Indeed, perhaps they should ask how such analysis could conceivably *not* be material to investors. From the organization's silence, investors can infer that management is not using decision analysis to plan for potential climate-related financial impacts, which will tend to undermine management's credibility, along with the company's investor base and stock price. When organizations speak about the results of their forward-looking financial analysis, as in Exxon's report, disclosures should build confidence in management's ability to build and maintain a climate-resilient business model while also being complete, clear, balanced, understandable, reliable, verifiable, and objective. The introduction of decision analysis into climate-related financial disclosure means that strategic planning and financial reporting objectives and responsibilities now overlap.

Grading

We began our evaluation with strategic planning because that is where the analysis to inform climate-related financial disclosure should begin. In the temporal progression, internal corporate analysis informs disclosure, which in turn informs investment analysis to determine if stockholders should buy, sell or hold a company's securities

Strategic Planning: “Unsatisfactory”

Grading criteria: Does the report demonstrate that management is undertaking the appropriate steps to build and maintain a climate-resilient business model? More broadly, does the report demonstrate that management is using decision analysis to rigorously analyze the varying impacts of a wide range of potential future climate scenarios, and that management has undertaken the necessary steps to evaluate alternative strategies and to identify and implement an optimal strategy to realize shareholders' long-term objectives?

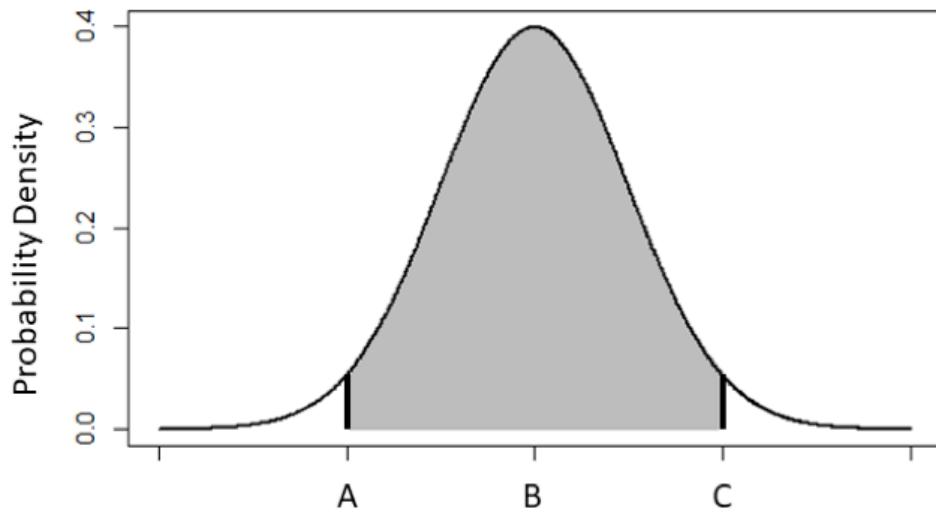
We believe Exxon's report falls short in meeting this objective in several ways. First, the report provides no evidence of a rigorous climate-related decision analysis. Second, Exxon's Outlook for Energy scenario, which Exxon says “forms the foundation of the company's strategic decisions, business plans, and investments,” does not extend beyond 2040. Finally, Exxon's 2°C scenario assessment fails to consider plausible policy actions in line with the Paris Agreement to keep global temperature rise this century below 2°C above previous levels and to support efforts to limit the temperature increase to no more than 1.5°C.

No indication of climate-related decision analysis

For a large and sophisticated company like Exxon we believe robust climate-related decision analysis would, at a minimum, include the following:

- Use of multi-period, multi-objective asset and liability planning, analysis and modeling of alternative management strategies (as used by insurance and reinsurance companies to assess their enterprise risk exposure).
- Consideration of several generally accepted climate scenarios, such as the International Energy Agency's (IEA) [sustainable development scenario \(SDS\)](#).
- Perturbation of the key variables within those scenarios using a stochastic scenario generation system. Consideration of financial outcomes under a range of potential scenarios in this manner provides a mathematically and statistically robust distribution of potential results.

- Acknowledgement that there is no “[base case](#)” scenario that is more likely than any other and that the multitude of uncertainties means the probability of any one scenario materializing exactly as described is negligible. Instead of a base case, there may be a central tendency of the wide distribution of potential scenarios that can be described by the mean, median or mode of the distribution.
- A probability distribution graph similar to the example shown below. In this way a company can say to its investors, as insurers often state following a loss resulting from an insured event, “Our best estimate of the result of event X is a loss of B with a 90% probability of the range of that loss being between A and C.”
- Most importantly, an explanation of the optimal strategy selected by management to minimize the adverse impact of climate risk and maximize the company’s opportunity of economic success.



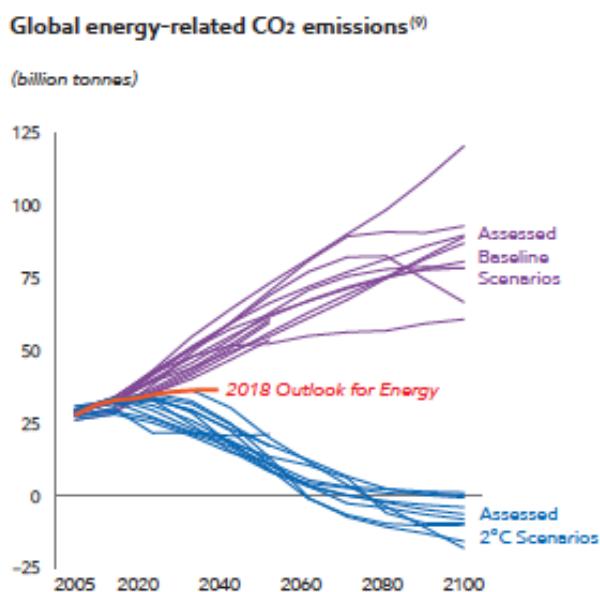
Probability density graph

The report does not contain a probability density graph and related discussion, and there is no clear indication in the report that Exxon performed a rigorous climate-related decision analysis. Also, Exxon says its 2018 Outlook for Energy represents the company’s updated view of the “most likely” future for the global energy system. This implies that Exxon is planning around a base case instead of a central tendency, which is inconsistent with decision analysis.

The report also suggests that Exxon may be ignoring plausible low probability, high impact scenarios by “chopping the tails off the distribution” (e.g., the outcomes to the right of “C” in the above probability density graph). The chart below reprinted from page 7 of the report shows the energy-related CO₂ emissions trajectories under Exxon’s “assessed baseline scenarios” (assuming essentially no policy evolution beyond those that existed in 2010) and Exxon’s assessed 2°C scenarios – a range of 13 “full technology” scenarios developed by the [Energy Modeling Forum Study 27 \(EMF 27\)](#) in 2012 and submitted for publication in January 2013, almost two years before the Paris Climate Accord (COP 21) in December 2015. Accordingly, the EMF 27 scenarios “assessed” by Exxon in February of 2018 were developed without the benefit of knowledge of the terms of COP 21 with respect to greenhouse gas emissions mitigation, adaptation

and finance, or the commitments, as of February 2018, of 174 states and the European Union, representing more than 88% of global greenhouse gas emissions.

The chart shows that nearly all of the 2°C scenarios assessed by Exxon assume net negative global emissions between 2060 and 2100 in order to achieve a 2°C target by 2100. The blue lines extending below the zero axis represent net negative global emissions achieved through technologies such as carbon capture and sequestration. Exxon's preference for climate solutions that include negative emissions technologies is understandable. Future net negative global emissions allow a slower fall in near-term emissions for the same temperature outcome. However, the feasibility of future net negative global emissions is uncertain. Global negative emissions would require large-scale deployment of technologies that achieve net removal of CO₂ from the atmosphere, all of which face severe technical, economic and resource constraints.



Reprinted from Exxon's 2018 Energy & Carbon Summary

Exxon excluded from its "Assessed 2°C scenarios" any scenarios developed over the past five (5) years and any scenarios that seek to limit global temperature increase to 1.5°C. It also considered only scenarios that tend to overshoot emissions objectives before 2070 and then rely upon implementation of "full technology" negative emissions technologies (assumed in the EMF 27 scenarios) to get back to 2°C by 2100. The exclusion of a wide range of climate scenarios consistent with COP 21, which Exxon says it supports, calls for more explanation than provided in the report.

When presented with a range of scenarios, managers often incorrectly tend to choose one or two immediately to the right and left of what they believe to be the "most likely" case. They regard the extreme scenarios as a waste because "they won't happen" or, if they do happen, "all bets are off." By ignoring the outer scenarios and focusing exclusively on moderate improvements or deteriorations from an assumed base case, management often leave themselves exposed to dramatic changes that occur in the "fat tails" of the distribution of potential results – particularly on the downside. This is precisely what a majority of Exxon's shareholders is concerned about, as evidenced by the shareholder resolution.

Exxon's base case scenario does not extend beyond 2040

The report says Exxon's 2018 Outlook for Energy, which does not look out beyond 2040, "forms the foundation of the company's strategic decisions, business plans, and investments." Readers can therefore infer that Exxon's current business strategy and investment policies do not consider potential policy constraints on CO₂ emissions beyond 2040, notwithstanding that upstream investments made in coming years will need to remain economic long afterward. It is these future investments that are most at risk to climate-related impacts, most within the control of management, and of greatest concern to investors.

Exxon's 2°C "stress test" sidesteps COP 21

Exxon's 2°C assessment is not a really scenario analysis at all, but a "what if" analysis, intended to respond to investor concerns about the company's financial condition "under a scenario in which reduction in demand results from carbon restrictions and related rules or commitments adopted by governments consistent with the globally agreed upon 2 degree target." However, if Exxon's shareholders were expecting a demanding 2°C stress test, it is not what they got. Instead, Exxon limited its 2°C assessment to "full technology" scenarios in which emissions overshoot 2°C stabilization targets prior to 2100 before technology-enabled net negative global emissions kick in between 2070 and 2100 to bring CO₂ concentrations back in line with 2°C targets. This approach of robbing Peter (in the form of future net negative global emissions) to pay Paul (prior cumulative emissions exceeding 2°C targets) helps Exxon avoid hard decisions and justify continuation of business as usual.

Because it omits evidence of a robust climate-related decision analysis, does not report on planning beyond 2040, and fails to stress test against COP 21, we give the report a "U" for meeting the its strategic planning objectives.

Financial reporting: "Unsatisfactory"

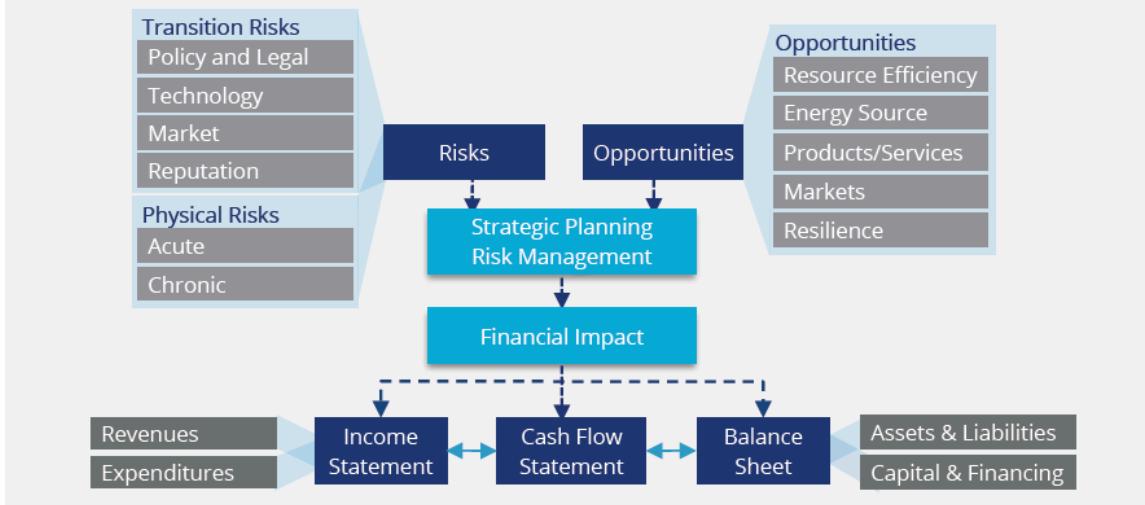
Grading criteria: Does the report provide decision-useful analysis of potential future climate-related financial impacts?

The results of climate-related decision analysis are what the International Accounting Standards Board (IASB) calls "other" financial information, or "information intended to complement the financial statements by providing insight into the company's strategy for creating shareholder value over time, its progress in implementing that strategy, and the potential impact on future financial performance not yet captured by the financial statements" (see [IASB Staff Paper on Wider Corporate Reporting](#)).

Figure 3 from the TCFD implementation annex (reprinted below) outlines the main climate-related risks (transitional and physical) and opportunities organizations should consider as part of their strategic planning and risk management to determine potential financial implications. How does Exxon's report stack up against this template?

Figure 3

Climate-Related Risks, Opportunities, and Financial Impact



Reprinted from TCFD Final Report

Revenues & Expenses

Exxon addresses future income statement impacts under its 2°C assessment as follows:

We test our investments over a wide range of commodity price assumptions and market conditions. As we consider a third-party's estimate of future prices under its 2°C pathway [referencing IEA: *Perspectives for the Energy Transition, Estimate for IEA crude oil and Natural gas and future prices for 2020, 2030, and 2040*], we note that these fall within the range we use to test our investments.

Additionally, over our long history we have successfully competed in periods where supply exceeds demand. In such a business environment, the lowest cost of supply will be advantaged. ExxonMobil's long-standing focus on efficiency and continuous improvement will help ensure we compete successfully.

In sum, the company's view appears to be that whatever the future may bring, the world will still need a significant amount of oil and gas, and Exxon will be competitive as a low cost supplier. To add credibility to this assertion, the report includes a chart showing Exxon's significant low cost competitive advantage in refinery operating expenses relative to the industry average. The report does not provide a similar chart for the company's upstream costs or its capital expenditures on exploration and production relative to peers even though many industry analysts view the period between 2003 and 2012 as a period of largely unproductive "binge" capital expenditures on exploration and production. The report also omits data on Exxon's marginal production costs relative to peers to support its contention that it will be the last man standing.

Assets & Liabilities

Assets

The shareholder resolution specifically requested that Exxon analyze the impacts of climate change on its “full portfolio of reserves and resources through 2040 and beyond.” Exxon reported on existing proved and unproved reserves as of 2016 as follows.

Based on currently anticipated production schedules, we estimate that by 2040, over 90 percent of our year-end 2016 proved reserves will have been produced.

Considering that the 2°C Scenarios Average [Exxon’s selected 2°C scenario] implies significant use of oil and natural gas through the middle of the century, we believe these reserves face little risk.

For the less than 10 percent of our year-end 2016 proved reserves that are projected to be produced beyond 2040, the reserves are generally associated with assets where the majority of development costs have been incurred before 2040. While these proved reserves may be subject to more stringent climate policies in the future, we believe that investments could mitigate production-related emissions and associated costs. In addition, these assets have generally lower risk given the subsurface and operational knowledge that accumulates over many decades of production. Accordingly, we believe the production of these reserves will likely remain economic even under the 2°C Scenarios Average.

For producing assets that do not currently meet the SEC’s definition of proved reserves, we expect to continue producing these assets through the end of their economic lives. We continue to enhance the long-term viability of these assets through increased efficiency, cost reductions, and the deployment of new technologies and processes.

At the end of 2016, ExxonMobil’s non-proved resources totaled about 71 billion oil-equivalent barrels. The size and diversity of ExxonMobil’s undeveloped resource base provide us with considerable flexibility to profitably develop new supplies to meet future energy demand and replenish our proved reserves. We also continue to increase the quality of our resources through successful exploration drilling, acquisitions, and ongoing development planning and appraisal activities.

Conclusions about the economic viability of Exxon’s existing petroleum reserves under its 2°C assessment are, of course, conditioned on the embedded assumption that excess carbon emissions from these resources between now and 2040 will be offset by negative emissions later on. The report offers no detailed quantitative analysis of the conditions under which Exxon’s existing reserves would become non-economic.

Liabilities

The report omits any reference to the potential impact of climate change on the company’s liabilities. This is a significant deficiency. Oil companies are legally obligated to decommission, plug and abandon their oil and gas wells and platforms when these assets reach the end of their useful economic lives. These liabilities, called “asset retirement obligations,” appear on oil company balance sheets as discounted present value estimates of costs expected to be incurred 10, 20, 30 or more years in the future as existing producing assets become uneconomic. If climate-related factors cause the premature retirement of oil and gas assets — those in existence today or those resulting from future investments — this will accelerate the maturity of corresponding asset retirement obligations, causing present value estimates to increase.

Exxon's [2017 Form 10-K](#) reports asset retirement obligations of \$12.7 billion as of December 31, 2017 (down from \$13.2 billion at December 31, 2016). Yet, as reported by the [Journal of Petroleum Technology](#), Exxon acknowledged in February 2018 at DecomWorld's Decommissioning and Abandonment Summit that it has asset retirement obligations of around \$35 billion, or three times its reported accounting estimate. Suffice it to say that these obligations are highly uncertain and extremely material.

The report's failure to consider asset retirement obligations in its 2°C assessment is a shortcoming that should be addressed in future assessments. Exxon should also address the uncertainty and variability surrounding decommissioning cost estimates in its 10-K disclosures on "critical accounting estimates," particularly given Exxon's historical record of repeated and significant upward revisions to previously reported estimates of asset retirement obligations. See [Environmental Disclosure Report Card: Oil and Gas Decommissioning Liabilities 2003-2014](#).

Omission of any discussion or analysis of asset retirement obligations obscures a significant climate-related financial risk. The oil industry pays for decommissioning costs as they come due from current operations. There is no retirement savings account. If climate-related events trigger the early retirement of producing assets, and extra cash is needed for decommissioning costs, Exxon will not have the option of turning to the capital markets. Decommissioning costs produce a "return on environment" but offer no return on investment. Investors are right to be concerned that a combination of declining revenues and rising expenditures for decommissioning costs could trigger a liquidity crisis in a 2°C scenario.

For more on oil and gas industry asset retirement obligations, see [Why the Oil Industry Cannot Afford to Retire](#).

Capital & Financing

Exxon justifiably claims that its financial strength and access to capital gives it added flexibility to deal with an uncertain future. The report also points to the company's "disciplined operating and investment capabilities" as reason to believe its future upstream investments will produce acceptable returns and cites past evidence of its ability to successfully redeploy resources and capital when needed (e.g., downstream rationalization).

Aside from these conclusory statements, however, the report omits any detailed quantitative analysis of projected capital expenditures (Capex) to find and develop new petroleum resources. Exxon's has a massive Capex budget for exploration and production and anticipates continuing to acquire and find new reserves between now and 2040. The report references the IEA New Policies Scenario, which estimates cumulative oil and natural gas investment may reach approximately \$21 trillion between 2017 and 2040. Exxon invested \$22 billion on upstream Capex in 2017. At this pace, total upstream Capex on post-2016 reserves could well exceed \$500 billion by 2040. As noted above, it is these future investments that are most at risk to climate-related impacts, most within the control of management, and of greatest concern to investors.

The report offers no analysis of the conditions under which resources acquired through post-2016 Capex might become non-economic. For example, unlike competitors Eni, Shell, and Total, Exxon makes no references to investment analysis based on internal carbon prices, carbon intensity, or the NPV impact of alternative strategies. Here again, asset retirement obligations, which are in essence back-end capital expenditures, must be considered in evaluating the projected return on future investments.

Exxon, like other oil companies, is between a rock and a hard place when it comes to planning for future investments. Because analysts value Exxon's shares in large part based on the company's ability to replace production to meet future demand, management is incentivized to issue reports

like this one: [ExxonMobil Adds 2.7 Billion Barrels to Reserves; Replaces 183 Percent of 2017 Production.](#) Yet, to satisfy investors concerned about the company's performance under a 2°C pathway, Exxon needs to demonstrate that massive investments in new petroleum resources will not be at risk. Investors may seem two-faced for wanting their cake while eating it too, but it is management's job to resolve these conflicting objectives. Exxon's challenge is to assure investors that it is capable of creating shareholder value now when reserve replacement is important *and* in a foreseeable future when it is not. This is the essence of a climate-resilient business model.

Because it provides no detailed quantitative analysis of climate-related impacts on existing and future petroleum resources and omits any discussion of asset retirement obligations, we gave the report a "U" for meeting its financial reporting objectives.

Public relations: "Needs Improvement"

Grading criteria: Does the report build investor confidence in the company's ability to mitigate legal risks and create shareholder value throughout the transition to a low carbon economy?

To answer this question, it helps to think first about how a company's management of climate risk may add or subtract from shareholder value over the long term. In its [Foundations of ESG Investing - Part 1: How ESG Affects Equity Valuation, Risk And Performance](#), MSCI explored the causal link between environmental, social and governance (ESG) information and the valuation and performance of companies. Its research indicates that companies with a strong ESG profile increase their discounted cash flow (DCF) valuations through three distinct channels, summarized as follows:

- *Increased cash flow.* Companies with a strong ESG profile are more competitive than their peers. They use their competitive advantage to generate abnormal returns, which ultimately leads to higher profitability and higher dividends.
- *Lower company-specific risk.* Companies with strong ESG characteristics typically have above-average risk control and compliance standards across the company and within their supply chain management. As a result, they suffer less frequently from severe incidents. This lowers stock-specific downside tail risk in the company's stock price.
- *Lower cost of capital.* Companies with a strong ESG profile are less vulnerable to systematic market shocks and therefore show lower systematic risk. Ultimately, this translates into a larger investor base and a lower cost of capital. Companies with a strong ESG profile have a relatively large investor base due to two effects:
 - *Investor preferences:* Risk-averse investors and socially conscious investors tend to avoid exposure to companies with poor ESG profiles.
 - *Information asymmetry:* Companies with strong ESG profiles are typically more transparent with respect to identification and management of ESG risk exposures.

Drawing on MSCI's research, we compiled a checklist of climate-related ESG performance characteristics that a company should emphasize in order to build investor confidence in its ability to deliver sustainable shareholder value. The list includes:

- Strong business competitiveness relative to peers
- Strong risk management
- Strong governance
- Transparent disclosure

We then checked to see whether Exxon's report credibly laid claim to these characteristics.

Business competitiveness

The report touts the company's competitiveness relative to peers, stating, "over our long history we have successfully competed in periods where supply exceeds demand. In such a business environment, the lowest cost of supply will be advantaged. ExxonMobil's long-standing focus on efficiency and continuous improvement will help ensure we compete successfully." Exxon attributes its competitiveness in part to its "disciplined operating and investment capabilities". As credible evidence, Exxon points to how, over the past twenty years during a period of over capacity and industry rationalization, its downstream refining business strengthened its competitive position by divesting smaller, less competitive facilities and redeploying resources and capital to its larger, more efficient integrated petrochemical sites.

We find that Exxon makes a credible case for its historical competitiveness relative to peers.

Risk management

The report characterizes the company's risk management systems as "mature" and lists four pillars of its climate change risk management strategy: mitigating emissions in its own operations (notably including fugitive methane emissions); developing scalable technology solutions; providing solutions for its customers; and engaging on climate change policy. The report then dedicates a full page or more to each of these pillars.

We believe Exxon makes a credible case that it has a strong risk management program.

Governance

The report highlights that, "Climate risk oversight ultimately is the responsibility of the Board of Directors" and provides considerable detail on the climate-related responsibilities of the board and senior management. It also states, without supporting detail, that the company's executive compensation program incentivizes long-term risk management with long restriction periods on performance share awards and key performance metrics for safety, operations integrity, and sustainability.

The report does not address the pending investigations and legal proceedings described in the background section above. Exxon's current legal situation appears to us to reflect past governance failures. We can understand why the company does not want to discuss pending legal matters for fear of prejudicial effect. Nonetheless, the report does little to assuage shareholder concerns about climate-related legal risk.

Overall, we find that the report falls short in providing reasonable assurance that the board is exercising adequate oversight of climate-related risks.

Transparent disclosure

Given the background context, transparent disclosure of the company's 2°C assessment is by far the most important public relations element of this report. Here Exxon came up short.

On the plus side of transparency, the report acknowledges risks posed by extreme weather and other natural elements, and says that the company actively designs its facilities and operations in consideration of such risks. For added credibility, the report reminds readers that Exxon has long operated facilities in a wide range of challenging physical environments around the globe, and that the company's long history of design, construction, and operations provides it with a solid foundation to address risks associated with different physical environments.

The report is also clear that Exxon's annual [Outlook for Energy](#) (highlights of which are included in the report) is the company's base case analysis — i.e., the results obtained from running an

economic model with the “most likely” or preferred set of assumptions and input values — and that it forms the foundation of the company’s strategic decisions, business plans, and investments. By contrast, Exxon characterizes its 2°C scenario as “hypothetical”. Of course, Exxon’s base case scenario is also hypothetical.

On the minus side of transparency, key assumptions in Exxon’s 2°C scenario analysis are not clearly and prominently stated. Instead, readers must take the time to study the report’s diagrams, extensive footnotes and other relevant information outside of the report to understand key assumptions and uncertainties.

In many respects, Exxon’s report is an effective public relations effort. However, given the background context, the success or failure of the report from a public relations perspective rests almost entirely on the company’s 2°C assessment. Because it deviates from investor expectations for a “globally agreed” 2°C scenario consistent with COP 21 and fails to clearly and prominently disclose key assumptions underlying its analysis, we gave the report a public relations score of “NI”.

Conclusion

When evaluated for its effectiveness in achieving key objectives based on the criteria set forth above, we believe Exxon’s report objectively merits an overall score of “U” for unsatisfactory. Whether or not Exxon is in fact doing so, the report does not demonstrate that the company is undertaking the appropriate steps to build and maintain a climate-resilient business model. Nor does the report provide decision-useful analysis of potential future climate-related financial impacts. Finally, we believe more assurance on governance and greater transparency into key assumptions underlying its 2°C assessment is needed to build investor confidence in the Exxon’s ability to mitigate legal risks and create shareholder value throughout the transition to a low carbon economy.

We want to emphasize again that our aim is to evaluate Exxon’s disclosure rather than the company itself. In our judgment, Exxon’s report fails to satisfactorily achieve the objectives of this new form of shareholder communications. This suggests that Exxon’s management does not fully understand or agree with these objectives. We welcome a discussion about objectives. Climate-related financial reporting is a new discipline. There is much to learn, and before we all start climbing, it would be good to know that our ladder is leaning against the right wall.

In sum, Exxon’s 2018 Energy and Carbon Summary is an example of “climate-related *financial* disclosure”. Such disclosures will soon become a part of routine annual corporate reporting, often included within or cross-referenced by annual shareholder reports and regulatory filings. This new form of shareholder communications is a convergence of partially overlapping strategic planning, financial reporting, and public relations objectives. With these objectives in mind, boards and senior management of other companies can learn from Exxon’s first climate risk assessment when preparing their organizations for climate-resiliency, financial disclosure, and investor engagement. Along with Exxon, many other companies will soon be producing similar reports, and we hope that establishing objective grading criteria for climate related financial disclosure will improve the overall quality of those efforts and enable all stakeholders to:

... assess the credibility of firms’ transition plans and their ability to execute them, and analyze the potential changes in value of their assets and liabilities that could result from a transition to a lower carbon economy or to other climate-related events (e.g. physical or legal risks).

