Physical Risks of Climate Change (P-ROCC)

A new framework for corporate disclosures

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“As a global asset owner with a multi-decade time horizon, we think it is critical to understand how companies are planning to adapt to the physical risks of climate change. Absent this information, we are left to wonder what, if any, steps a company has put in place to prepare for the future.”

— Beth Richtman, Managing Investment Director-Sustainable Investments at CalPERS

“We believe that improved disclosure from companies will help us better assess climate-related risks and enhance our capacity to serve as fiduciaries of client assets.”

— Wendy Cromwell, Vice Chair and Director, Sustainable Investment at Wellington

Background

In September 2018, Wellington Management, Woods Hole Research Center (WHRC), and the California Public Employees' Retirement System (CalPERS) announced a research collaboration to analyze and better understand how and where climate change may impact global capital markets. In our research to date, we have noted a lack of detailed company disclosures on the *physical effects* of climate change. Such disclosures will likely improve over time, as more companies aim to comply with emerging global regulations or voluntarily report activity in support of existing frameworks — such as the CDP (formerly the Carbon Disclosure Project), the Task Force on Climate-related Financial Disclosures (TCFD), and other environmental, social, and governance (ESG) recommendations.

While supporting these climate-oriented frameworks is a step in the right direction, it appears to us that most companies are primarily focused on assessing and reporting *transition risks*. To meet the need for improved physical risk disclosure, Wellington Management and CalPERS have collaborated to create a new **Physical Risk of Climate Change (P-ROCC) framework**,[1] which we believe provides a helpful guide for company management teams to integrate climate science-based scenarios into their strategic planning and disclosures.

CLIMATE RISKS CAN BE DIVIDED INTO TWO AREAS:

TRANSITION RISKS refer to effects on companies as economies decarbonize. These risks may include policy and regulation, litigation, adoption of alternative energy sources, and shifting consumer preferences or behavior.

PHYSICAL RISKS refer to the manifestations of a changing climate and their associated costs. Physical risks include both chronic changes, or long-term shifts in climate patterns; as well as acute events, which may increase in severity or frequency in light of chronic changes.

Potential benefits of the P-ROCC framework

With this guidance, we encourage companies to leverage climate science-based scenarios to better prepare for and disclose the physical risks of climate change. We believe that improved disclosure of climate preparedness offers companies many benefits, and we hope executive teams and boards of directors find the P-ROCC framework useful as they develop strategies to identify, measure, and manage their physical climate risk exposure. An improved understanding and disclosure of physical climate risks could help a company:

1. Better relay information to capital providers, investors, markets, and regulators;
2. Meet new disclosure requirements more effectively;
3. Assure investors that it takes these risks seriously — (absent disclosure, market participants may presume that the company is unprepared for climate-related risks, affecting stock price volatility, cost of capital, confidence in management, and potential litigation);
4. Recognize and adapt to the effects of climate change on operations; and
5. Form a baseline to assess and build competitive advantage.

[1] This framework does not include traditional climate-focused sustainability disclosures, such as corporate emissions policies or the exposure to transition risks such as potential litigation, regulations, shifting consumer preferences, social pressure, and technological shifts. Numerous procedures and guidelines already exist for these and many companies are already managing to them.

Business risks in a changing world

The physical risks of climate change are varied and global; they include chronic risks like extreme heat, drought, and water access as well as acute risks like wildfires, hurricanes, and flooding.

While we refer to these variables as "risks," not every climate-related impact on an individual company or industry will be negative. Disclosures should consider both the downside and the potential benefits of climate change to the firm's business.

CHRONIC RISKS

EXTREME HEAT may damage roads, buildings, and transit infrastructure and can be devastating for agricultural industries. Businesses may need to increase capital spending for maintenance and replacement of equipment and inventory. They may need to install sensors or other devices to measure how well their infrastructure, operations, crops, or livestock can withstand high temperatures. They may even need to shift the geographies of their supply chains.

Above certain levels, heat, especially when combined with humidity, takes a human toll. As regions see more days of high heat, labor and energy costs may climb as outdoor productivity and hours decline and workers move indoors. Health care costs may go up, especially among vulnerable populations. Customers may change vacation destinations or have less interest in outdoor venues. Outdoor agricultural and construction productivity and hours worked may drop.

DROUGHT can affect the availability, access, and pricing of water and food. It can also increase costs for companies that rely on water as a key production input or means of transportation. Finally, drought can hamper hydropower generation and the stability of agricultural production.

SEA-LEVEL RISE is one of the most significant longer-term risks. Unmitigated, its potential for destruction of coastal residential and commercial property is significant, as is the potential impact of forced or voluntary human migration and the impact on infrastructure, municipalities, and economic growth. Companies may need to adapt or relocate operations, at substantial cost.

ACUTE RISKS

WILDFIRES, HURRICANES, AND FLOODING disrupt business operations by damaging property or inventory, or by causing power outages or government-service shutdowns. Such events may keep customers away or prevent shipments or transport; they may also contaminate soil and water, which could degrade consumer confidence in agricultural products and pose consumer health risks.

If perceived to be chronic, these risks can influence real estate values, as well as insurance costs and coverage availability. As the frequency and/or intensity of these risks increases, companies need to anticipate the potential business impacts and build resilience. Here again, our research suggests that companies in geographies that risk becoming unlivable, or suffering economically, due to these risks may need to work with communities to collectively increase adaptive capacity. New adaptation business opportunities may arise as a result of these needs.

P-ROCC framework — Defining preferred corporate practices and climate disclosures

IMPLEMENT PREFERRED PRACTICES

1. Develop climate scenarios

In preparing for these risks, companies cannot rely only on historical data. As the effects of climate change escalate, projections for the length, frequency, or intensity of weather events based on historical averages are likely to be less accurate. Given the likelihood of more severe physical outcomes, we believe scenario planning based on sound climate science research is imperative.

Climate scenarios are not predictions. They depend on assumptions about greenhouse gas (GHG) emissions, which vary according to human behavior; and human behavior will, in turn, be affected by government policies and technological developments. Scenarios can help companies assess and plan for a wider range of outcomes, so disclosure should include management's assumptions for underlying scenarios. As such, companies should not be evaluated on the accuracy of estimated impacts from climate change. Rather, they should be evaluated on the thoughtfulness and robustness of their scenario planning exercise and risk management around potential effects.

The most important elements for integrating physical risks into strategic assessments include the use of sound climate science and a range of climate scenarios and creativity (informed by the insights related to a specific business model and industry landscape) to imagine all of the potential effects on a company's business. A number of "off-the-shelf" risk tools are emerging to facilitate company-level scenario analysis; however, we suggest companies delve more deeply into risk assessments and engage senior management to ensure the highest quality and most useful insights for the particulars of their business.

2. Work with experts

Our collaboration with WHRC climate scientists has reinforced the importance of working directly with experts who understand the potential uses and implications of various climate science models, as well as the assumptions and nuances that comprise impactful scenario planning.

A company may need to hire climate science experts, work with an external consultant or climate specialist firm, or otherwise attain the knowledge needed to assess their risks and opportunities. For companies with significant exposure to climate change, staffing for climate expertise should be considered a critical organizational function similar to legal, IT, accounting, or enterprise risk expertise. The price of failing to plan for the effects of climate change on operations, profits, labor, or customers could potentially dwarf the cost of hiring a specialist to help anticipate and prepare for potential risks and/or be well worth the investment to capitalize on opportunities.

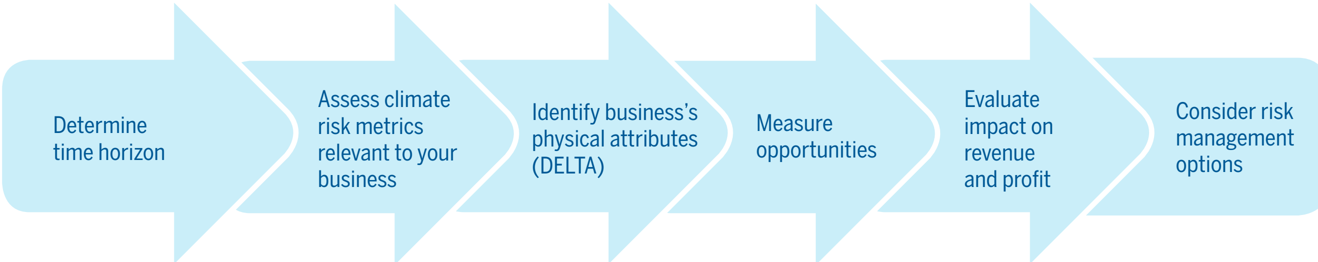
3. Build executive and board knowledge

Climate disclosures should note the executive-level and associated resources responsible for building climate resilience and managing associated risks. Disclosing the executive level of responsibility will help investors understand how the company is delegating climate-risk planning, strategy, oversight, and accountability. Boards of directors should also be informed and have a long-term vision for the firm's strategy around climate change, including effective management of risks and opportunities for operations, labor, and customer relations. As such, the board should include member(s) or committee(s) that possess pertinent environmental knowledge and experience, or have the ability to access appropriate independent sources.

DEVELOP CLIMATE DISCLOSURE

Below we offer a guide for developing physical climate disclosures that complement other climate-related disclosure frameworks such as the TCFD and CDP. Although we are not advocating a particular reporting method or prescribing where such disclosure should be published, we do believe that these details will be of high interest to a broad set of asset owners and asset managers. Please note that the suggested steps listed below are primarily intended to help improve the quality and usefulness of corporate climate-related disclosures on a broad scale. As such, they should be viewed as guideposts, rather than as a comprehensive "checklist" that encompasses all risks facing business lines.

Components of disclosure



1. Determine time horizon for scenario planning. For example:
   a. Short term: year to year
   b. Medium term: three to five years
   c. Long term: 10 to 30 years

2. Assess climate impact for each time frame, note key assumptions, and review process.
   a. Cite source of climate data and methodology.
   b. Detail climate assumptions, such as which warming scenario or scenarios (e.g., 1.5° or 3°, etc.) the company is planning for. We suggest that management teams consider multiple scenarios and time horizons and disclose each, as well as the data considered. Identify the base case your company uses for capital planning.
   c. Outline ongoing climate variables and metrics that are of the most concern and will be monitored closely.
   d. Learn from experience: Review the types and magnitudes of extreme weather events that have been disruptive or expensive in the past, noting any patterns. Recognize that climate change may alter the frequency, length, and intensity of such events.

3. Analyze the physical attributes of the company's business and note key climate variables that are of concern.
   a. This could include, for example, material geographies housing key business assets, including personnel, headquarters, supply chains, and end markets. For each geography identified, discuss probable impacts and associated costs.
   b. We suggest using the following organizing principle (**DELTA**):
      i. **D**emand: Changing location, health, resilience, and finances of customers. Disclose percentage of revenue and profit derived from countries or regions most at risk.
      ii. **E**xpenditures: Fixed asset augmentation, repairs, and impairment
      iii. **L**ogistics: Business or supply chain/ inventory disruptions, including travel and security of inputs (energy and raw materials)
      iv. **T**alent: Employee health and safety and location of labor pool
      v. **A**cquisition: Strategy to assess geographic climate risks that may arise as a result of potential mergers, acquisitions, or expansion plans

4. Identify business opportunities; for example:
   a. Expansion of product offerings
   b. Demand from new markets

5. Evaluate impact on revenue and profit over the time horizons chosen for scenario planning, assuming that no climate-related adaptation measures are taken within the business. Disclose estimated percentage ranges for the impact of climate change on revenue and profit. Note that estimated impact ranges could be cumulative or annual over these periods and may be positive or negative. Make a qualitative assessment of the materiality of this percentage range without undertaking adaptation measures. Add descriptive color as to the sources and pace of the overall impact over these time horizons.

6. Discuss the actions the company has taken or is considering to address the risks and opportunities that have been identified. This may include existing or prospective risk-management mechanisms such as:
   a. Transfer: Insurance coverage and how it may be affected (e.g., pricing, availability)
   b. Adapt: Strategy to allocate capital expenditures associated with facility or supply moves and retrofits

c. Repair: Disclose capital allocated to replacing or repairing assets that are impaired as a result of an acute event, and any relevant regulatory provisions or other mechanisms

Quantify the degree to which these actions will help the company adapt, including reference to the aggregate impact on revenue and profit over the chosen time horizons.

Closing thoughts

It was once said that the best risk tool is imagination. Imagination enables companies to predict and prepare for the future. By offering the P-ROCC framework, we are encouraging companies to couple sound climate science-based scenarios and corporate imagination to better prepare their organization for the physical risks of climate change. As investors, we seek improved disclosures about how the companies we invest in are assessing their vulnerabilities to and opportunities from climate change and building resilience to enable their long-term success.

We recognize that climate risk assessment is a work-in-progress at most companies, so we encourage disclosure on a best-efforts basis in the short term that improves with more refined analysis over time.

Additional resources

The following reports may be of interest for additional guidance and examples of disclosure:

- Task Force on Climate-related Financial Disclosures: **Status Report** (September 2018)
- **TCFD Implementation Guide**: Using SASB Standards and the CDSB Framework to Enhance Climate-Related Financial Disclosures in Mainstream Reporting
- **CDP Guidance for companies**
- **Advancing TCFD Guidance on Physical Climate Risks and Opportunities**: Prepared by Four Twenty Seven and Acclimatise for the European Bank for Reconstruction and Development (EBRD)