

# **Business Survey on Climate-Related Risk**

## **Executive Summary**

To better understand how businesses in our District are perceiving and adapting to a changing climate, the Federal Reserve Bank of San Francisco launched its first survey on climate risk in 2021. Nearly 100 businesses throughout the nine-state region responded to the survey, representing a wide range of industries including financial services, retail trade, and real estate (see details in the Appendix).

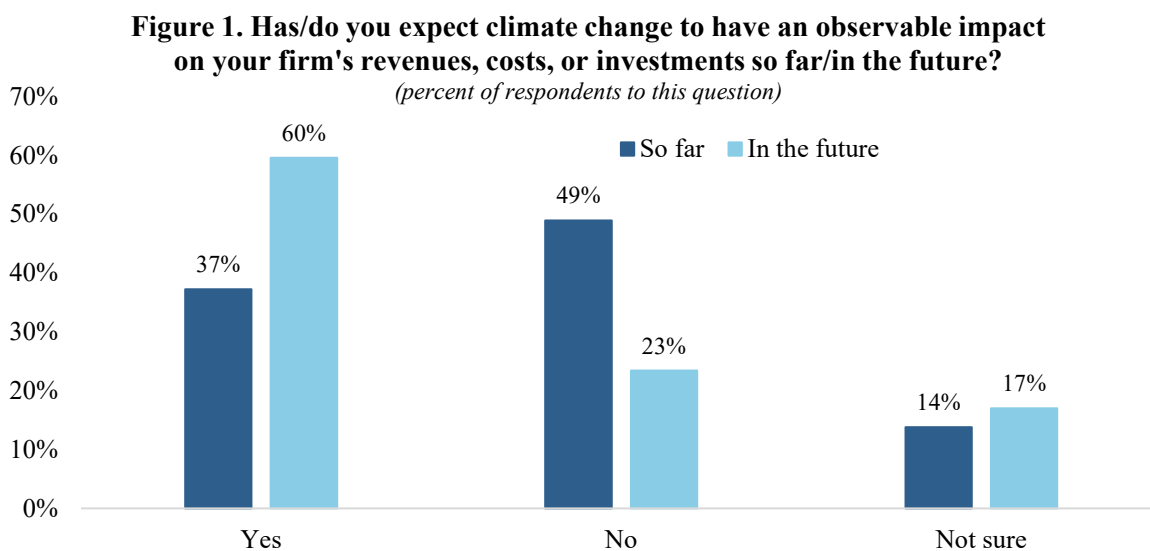
Our main findings are as follows:

1. Among respondents, 60% of firms indicated that climate change has had or is expected to have an observable impact on their revenue, costs, and investments through changing regulations, higher prices for raw materials, and general operating costs.
2. 37% of respondents that expect to be affected by climate change have designed or are designing a formal risk mitigation plan to address climate-related risks. These plans focus mostly on monitoring climate risk, increasing use of renewable energy, and setting targets to achieve carbon neutrality.
3. Even firms that do not have formal risk mitigation plans consider climate risk as an important factor in developing their business investment plans, designing an overall corporate strategy, and engaging in public relations (about 85% for all three categories in Section 3).
4. Even including companies that have allocated a low priority to climate risk and/or do not have a formal plan, 63% of all respondents indicated that they have taken the initiative to implement additional sustainability-related measures purely in the interest of corporate social responsibility and environmental, social, and governance (ESG) initiatives.

Overall, respondents agreed that continued gains toward sustainability will require a long-term commitment to learning about climate risk, implementing formal risk mitigation strategies, and assessing results. Still, businesses highlight that they face important hurdles to appropriately addressing climate risk, including limited resources, a lack of proper measurement data, and rapidly changing regulations.

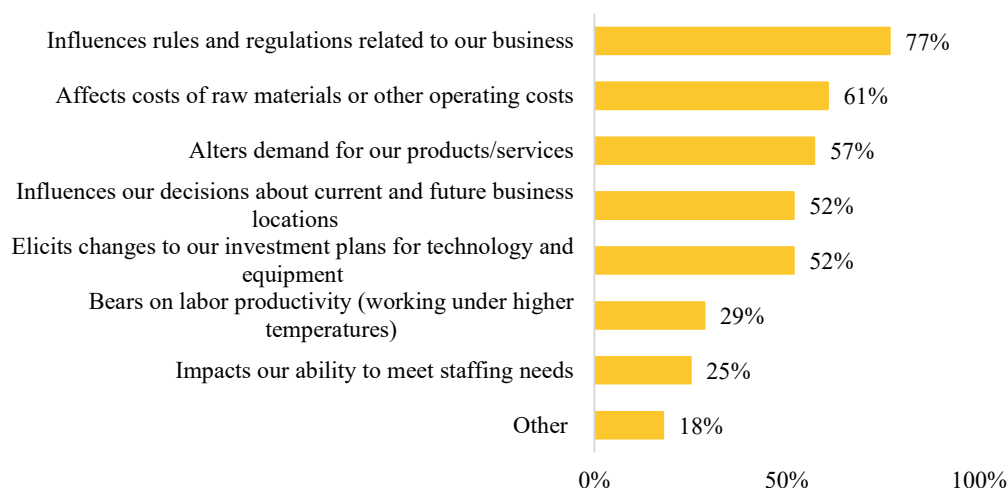
## 1. Majority of businesses expect to be affected by climate change.

- Among respondents, 37% indicated that climate change has already had an observable impact on their firms' revenue, costs, or investments. However, when asked whether climate change is expected to affect their business in the future, the share of affirmative responses shot up to 60% (Figure 1). In particular, the number of financial institutions that said "yes" doubled from 32% to 63% of the total number of financial institutions responding.



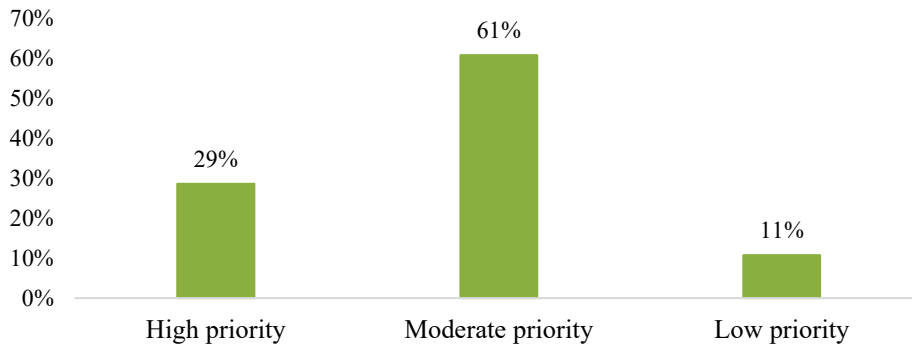
- The most common avenue through which climate change has or is expected to affect businesses is through influencing rules and regulations related to their business (77%), affecting costs of raw materials or other operations (61%), and altering demand for products/services (57%) (Figure 2).

**Figure 2. How does climate change affect or is expected to affect your business' revenues, cost, and investments?**  
(percent of respondents to this question)



- However, among respondents who already have/expect to experience impact from climate change in the future, only 29% give high priority to climate risk, compared to other business risks (Figure 3). The majority of businesses (61%) gave “moderate priority,” while 11% gave “low priority.”

**Figure 3. Relative to other business risks, what level of priority would you give to risks rising from climate change?**  
(percent of respondents to this question)



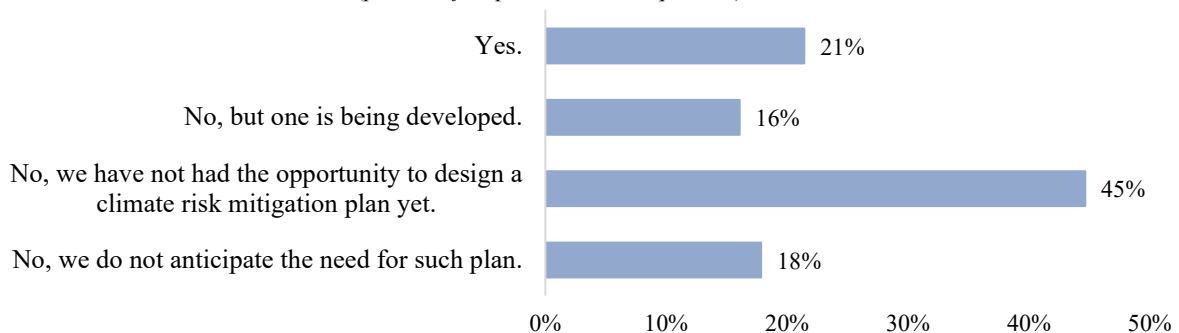
- The respondents who gave “low priority” cited insufficient resources dedicated to internal sustainability initiatives and other business risks, such as financial or COVID-related risks, as main factors that limit their ability to place greater importance on climate-related risks.

**2. Over one-third of respondents have designed a formal risk mitigation plan for climate risk.**

- Among respondents who already have been or expect to be affected by climate change, over one-third (37%) indicated that they have or are in the process of designing a formal plan to mitigate the risks arising from climate change (Figure 4). The agriculture and resource-related sector showed the highest concentration of firms that have developed a plan—about half of reporting firms within the sector.

**Figure 4. Does your business have a formal climate risk mitigation plan in place?**

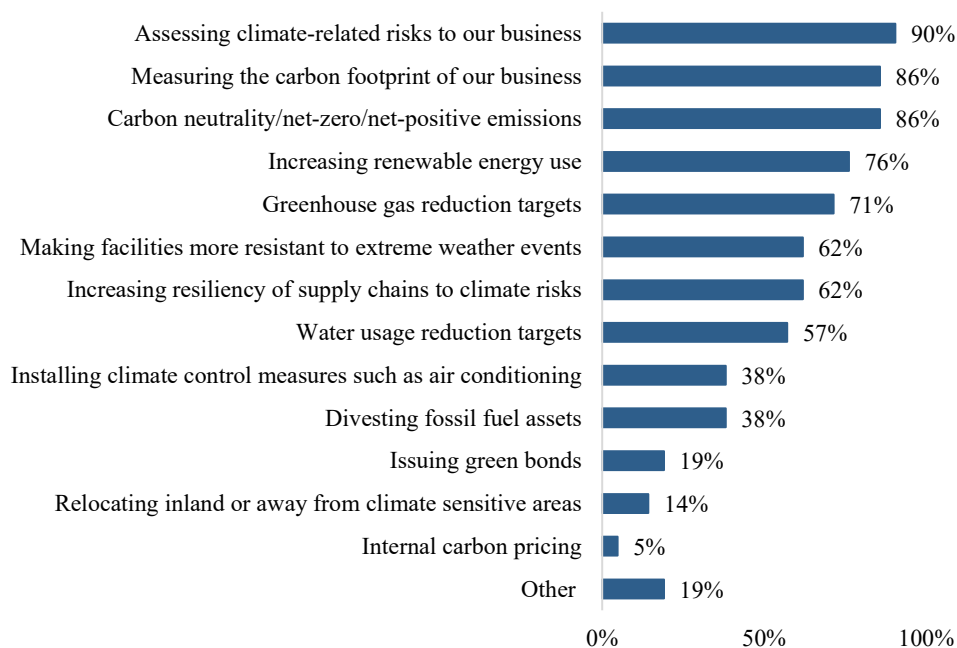
(percent of respondents to this question)



- Among the 37% of respondents who indicated that they have or are in the process of developing their formal climate risk mitigation plan, the most common initiatives included assessing their climate-related risks (90%), targeting carbon neutrality/net-zero/net-positive emissions (86%), and measuring their carbon footprint (86%) (Figure 5):

**Figure 5. Which of the following initiatives does your climate risk mitigation plan include?**

(percent of respondents to this question)



- *Assessing climate risk and carbon footprint:* Companies in industries that are most vulnerable to wildfires and droughts, such as agricultural firms and utilities, mentioned having internal teams dedicated to working with local governments and nonprofits to assess future climate risk. Others mentioned including climate risk as part of their enterprise risk management strategy or using GIS (geographic information system) and other technologies to identify areas of risk. Financial institutions and insurance companies mentioned using in-house or outside tools to measure the impact of climate risk on their portfolio companies and real estate holdings. In addition, most companies reported measuring their carbon footprint annually and setting a multiyear goal relative to a baseline year.
- *Carbon neutral/net zero:* The time horizon and metrics used in carbon neutral/net zero goals varied significantly by company, although several mentioned following the guidelines from the Task Force on Climate-Related Financial Disclosures (TCFD), an initiative developed by the Group of 20 Financial Stability Board. In general, companies are targeting either a notable reduction or net neutrality in carbon emissions by 2025 or 2030, with a few targeting 2040 or beyond. A few large tech and banking firms mentioned already having achieved carbon neutrality and are now targeting being completely carbon-free.

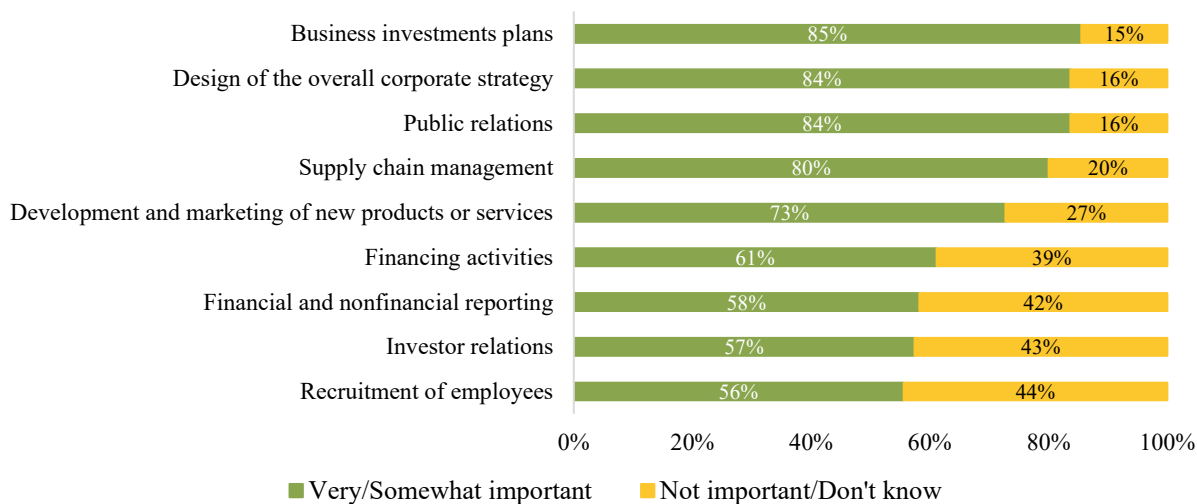
- *Renewable energy*: A majority of companies mentioned increasing their use of renewable energy by investing in solar panels, wind farms, backup generators, and energy storage technology. A few respondents also mentioned using renewable natural gas in transportation, partnering with local utilities to purchase renewable energy, and investing in fuel cell and biomass technology, which uses salvage timber and other agricultural waste to produce energy.
- *Reducing greenhouse gas (GHG) emissions*: Almost all greenhouse gas reduction plans included reducing carbon emissions throughout the supply chain and operations and using carbon offsets. Other common examples were improving energy efficiency of buildings and technologies, investing in renewable energy sources, reducing food waste and methane emissions (in the case of farmers), and increasing fuel efficiency in transportation by purchasing electric vehicles (EV) or using liquified natural gas as marine fuel.

### 3. Even without formal risk mitigation plans, climate change is an important consideration for many businesses.

- Even if they do not have a formal climate risk mitigation plan in place yet, most companies indicated that they take climate risk into consideration when making everyday business decisions. For example, they consider climate risk at least somewhat important for the following decisionmaking areas: business investment plans (85%), design of overall corporate strategy (84%), and public relations (84%) (Figure 6):

**Figure 6. In which of the following decision-making areas is climate risk an important consideration for your business?**

(percent of respondents to this question)

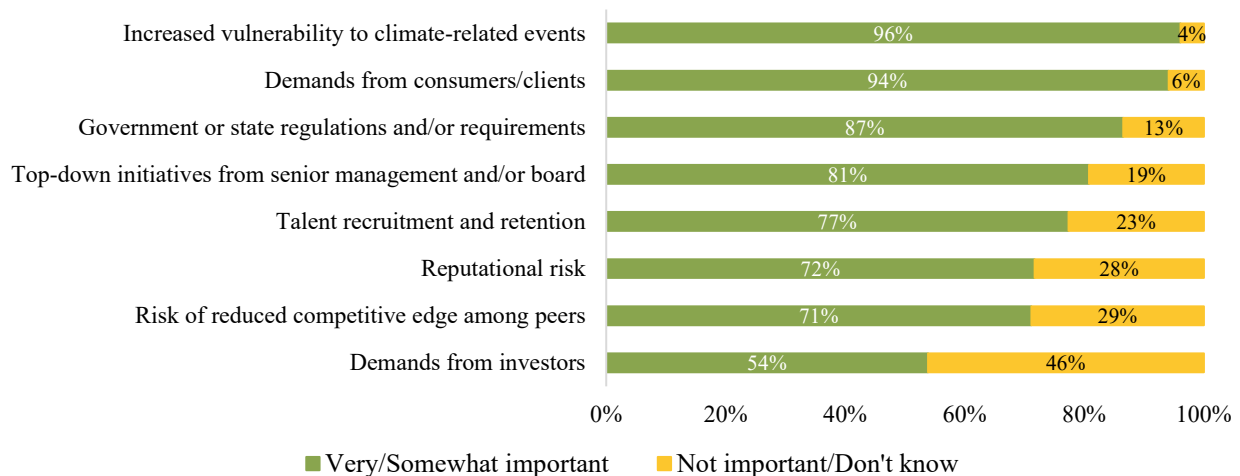


- *Business investment plans*: To reduce GHG emissions, many companies reported making substantial capital investments in purchasing wind or solar equipment, battery storage for renewable energy, EV charging stations, and new irrigation systems in the case of agricultural firms. In addition to physical investments, these new technologies

also required firms to install new software and IT systems to manage the more intermittent form of energy generation. Several respondents also mentioned longer-term plans to fortify their buildings and retail spaces against extreme weather events and protect from rising sea levels.

- *Overall corporate strategy and talent recruitment:* Several companies mentioned that climate change and sustainability are already well integrated into their overall corporate strategy and risk management, with a few stating that sustainability is a top-tier goal for their company. Others said that they have not or are still in the process of considering climate change in their corporate strategy, with a couple mentioning that they have hired external consultants to help them build a long-term sustainability plan. In addition, a majority of respondents observed that being a “green company” has become an increasingly important consideration for new hires and applicants, especially among younger employees.
- *Supply chain management:* A majority of companies reported that climate change has already started to negatively impact many areas of the supply chain due to extreme weather events both domestically and internationally. As a result, many of them are looking into diversifying their supply chains and assessing multiple vendors based on their environmental practices. Several respondents also said that these risk mitigation strategies are expected to drive up costs for their goods and services down the line.
- Respondents indicated that the most important factors that led them to consider climate change in these decisionmaking areas were increased vulnerability to climate-related events (96%), demand from consumers/clients (94%), and government or state regulations and requirements (87%). Surprisingly, the least important factor was demand from investors (54%) (Figure 7).

**Figure 7. How important are each of the factors listed below in influencing your business to take climate change into consideration, if at all?**  
(percent of respondents to this question)

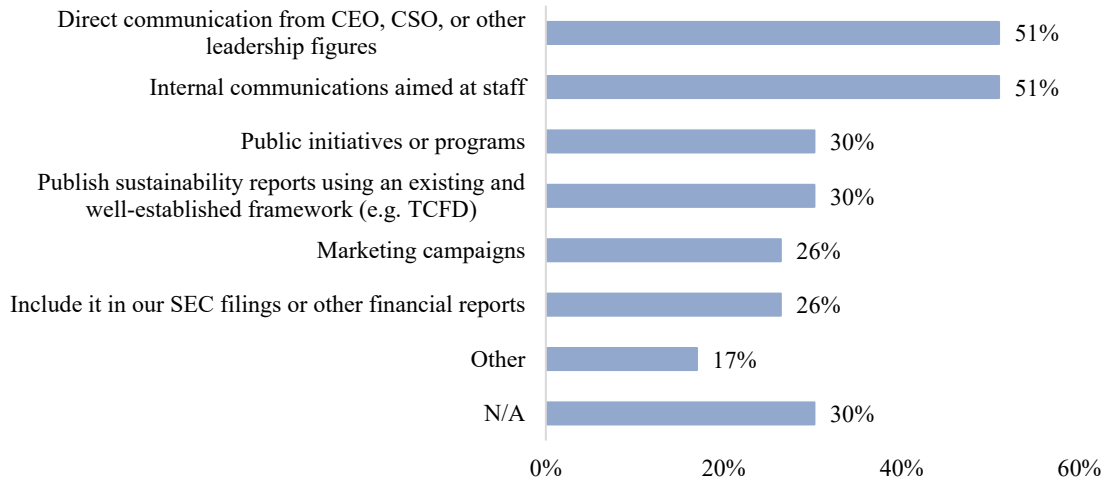


- The most popular way companies—including those without formal risk mitigation plans—said they communicate their climate initiatives is through direct communication

from their chief executive officer, chief sustainability officer, or other leadership (51%) and internal communications aimed at staff (51%). Among the respondents, 30% indicated that they have not yet implemented such communication measures (Figure 8).

**Figure 8. How does your company communicate your climate initiatives to various stakeholders, if at all?**

*(percent of respondents to this question)*

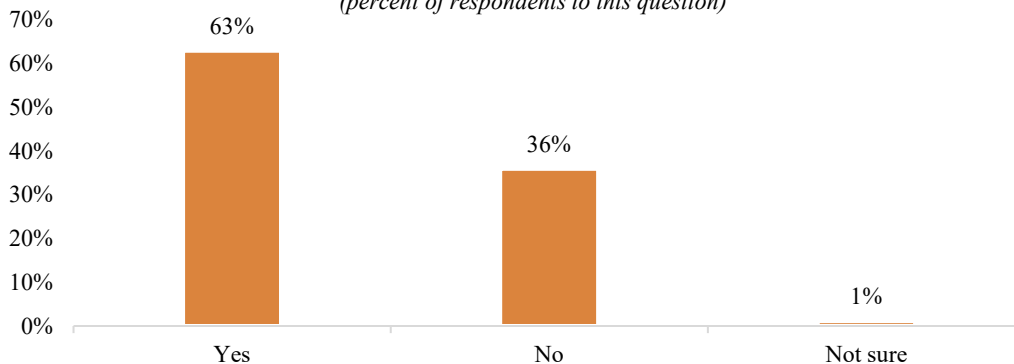


**4. Almost two-thirds of companies have implemented ESG-related sustainability measures.**

- Regardless of whether they expect to be affected by climate change or have a climate risk mitigation plan, 63% of all respondents indicated that they have taken additional sustainability-related measures purely in the interest of corporate social responsibility and environmental, social, and governance (ESG) initiatives—more than double the number of companies that have a formal risk mitigation plan (Figure 9). This implies that, although the percentage of firms that have a formal long-term risk mitigation plan may be low, many companies are taking the initiative to incorporate smaller sustainability-related measures in their day-to-day operations.

**Figure 9. Has your firm implemented any (additional) sustainability-related measures in the interest of ESG, corporate social responsibility, or good corporate citizenship?**

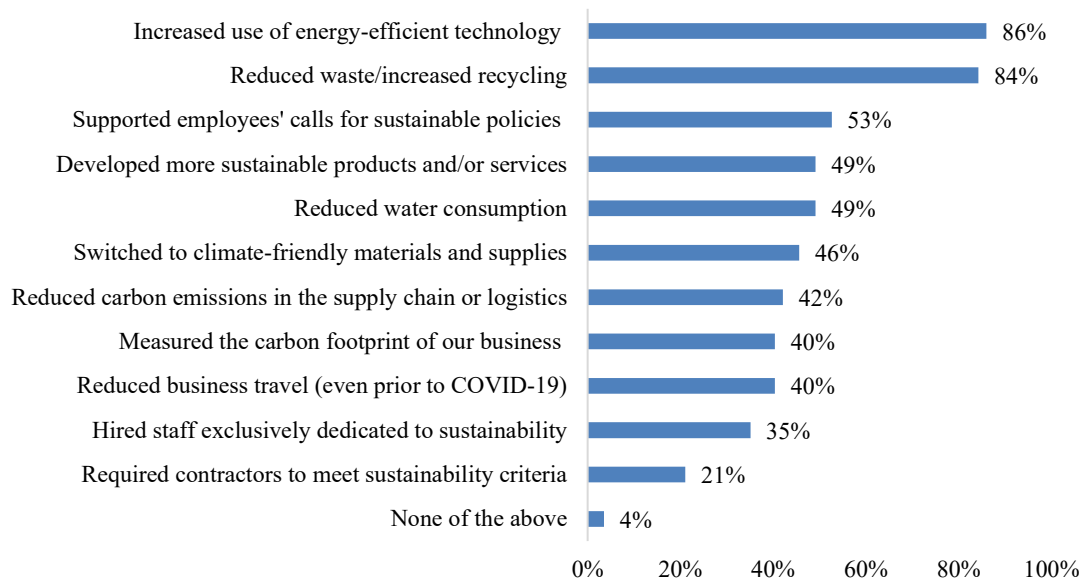
*(percent of respondents to this question)*



- The most common additional ESG-related measures were increasing their use of energy-

efficient technology and equipment (86%) and reducing waste or increasing recycling (84%) (Figure 10). However, it is important to note that a clear classification of specific measures can be difficult to make: what some firms report as being part of their formal risk mitigation strategies, others see as stand-alone actions related to corporate social responsibility and ESG initiatives (e.g. reducing carbon emissions).

**Figure 10. Has your business implemented any of the (additional) sustainability-related measures listed below?**  
(percent of respondents to this question)



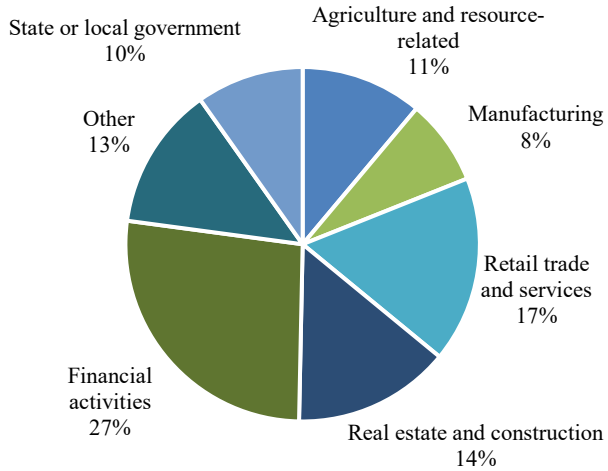
- In general, companies mentioned a wide range of progress toward climate change initiatives. Some have just started to consider ESG in their businesses. Others have been climate oriented for decades, particularly those in industries that are more directly affected by climate change or climate regulations, such as agriculture and resource-related firms. Financial institutions and insurance firms have also started to actively gather data from their portfolio companies on how they mitigate climate risk and incorporate that into their own risk profiles.
- Respondents raised a few concerns in open-ended answers, including the lack of reliable ESG measurement data to help make decisions in the real estate and finance sectors. Several respondents also mentioned that more frequent extreme weather events have caused insurance costs to rise for many properties, leading homeowners to rely more on self-insurance or government programs. A few manufacturing and utility companies that operate across several states highlighted that it is getting more challenging to meet different state requirements as the regulations sometimes evolve in conflicting directions.
- Overall, respondents overwhelmingly agreed that focusing on sustainability will be crucial for businesses going forward. Respondents recognized that climate risk and sustainability issues will require a long-term commitment to learning more about



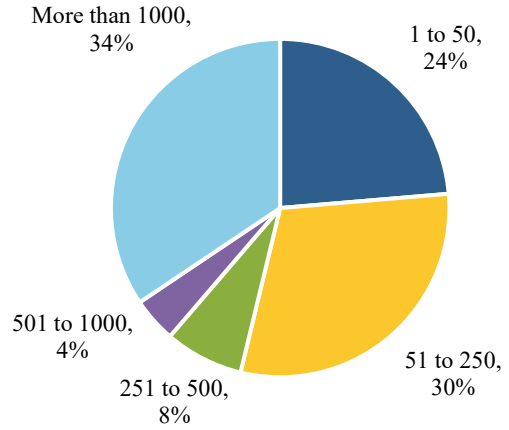
evolving risks, implementing formal risk mitigation strategies, and assessing results. Respondents also highlighted that organizational leadership teams can play an important role in supporting and enacting sustainability initiatives.

## APPENDIX 1. Additional Survey Information

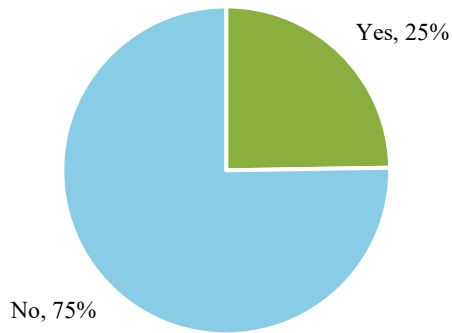
**Which of the following sectors can you comment on?**



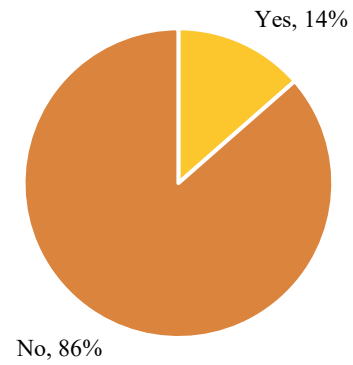
**Size of business in number of employees:**



**Is your company publicly owned/traded?**



**Do you consider your business to be a minority or women-owned Business Enterprise?**



## APPENDIX 2. Survey Questions

*Disclaimer: Not all questions were asked of every respondent. Questions that elaborated on specific themes were conditional on answers provided to previous questions.*

### Section I. Respondent Profile

***Welcome to the Federal Reserve Bank of San Francisco's first survey on Climate Risk. The survey is aimed at furthering our understanding of the potential impacts of and responses to climate risk throughout the economy. The insights you share about your own organization and sector will be invaluable as part of this effort. We invite you to answer the survey to the best of your ability and thank you for your participation.***

***The first section of the survey will collect information on your firm's profile. The second portion will delve into climate risk and how it impacts your firm. The third section will allow you to elaborate on your firm's corporate governance measures related to sustainability.***

1. Please provide basic information about the respondent.
  - a) Respondent's name:
  - b) Respondent's title:
  - c) Business affiliation:
  - d) Location of Business (City and State):
  - e) Size of business in number of employees:
  - f) Is your company publicly owned/traded?
  - g) Do you consider your business to be a minority or women-owned Business Enterprise (MWBE)?
  - h) Please list the area(s) or state(s) in your region:
  
2. With respect to business planning, workplace facilities, capital expenditures, management practices, strategy decisions, and climate change initiatives, which of the following sectors can you comment on? (Please check all that apply.)
  - a) Agriculture and resource-related (e.g., production and/or extraction activity associated with raw materials, livestock, food, energy)
  - b) Manufacturing (e.g., production activity associated with aircraft, electronic components, pharmaceuticals, wood, steel or other metals)
  - c) Retail trade and services (e.g., sales of consumer and/or business goods and/or services in apparel, auto, grocery, technology, dining, travel, tourism, legal, health care, or other professional services)
  - d) Real estate and construction (e.g., construction, sales, leasing activity for residential and commercial property)
  - e) Financial activities (e.g., loan demand, credit quality, credit standards, credit availability, private equity, venture capital, IPO activity)
  - f) State and/or local government (e.g., town, city, county, municipal, or state government and/or agencies)
  - g) Other (please specify)

### Section II. Climate Risk Mitigation

***Thank you for sharing your firm's profile. The first questions in this next section will focus on climate risk and how it impacts your firm, whether you currently observe or expect to observe any impacts on your business's revenues, costs, and investments from climate risk.***

3. Has climate change had an observable impact on your firm's revenues, costs, or investments so far?
- a) Yes
  - b) No
  - c) Not sure

4. Do you expect climate change to have an observable impact on your business' revenues, costs, or investments in the future?
- a) Yes
  - b) No
  - c) Not sure

***The next questions will give you a chance to elaborate on climate risk mitigation measures aimed at navigating the impact of climate change on your firm's revenues, costs, and investments. Later in this survey, you'll have a chance to elaborate on independent corporate governance measures related to sustainability. We will let you know when this switch happens. We kindly ask that you keep this distinction in mind when answering the remainder of the survey.***

5. How does climate change affect or is expected to affect your business' revenues, cost, and investments? Please select all that apply.
- a) Alters demand for our products/services
  - b) Elicits changes to our investment plans for technology and equipment
  - c) Influences our decisions about current and future business locations
  - d) Impacts our ability to meet staffing needs
  - e) Bears on labor productivity (working under higher temperatures)
  - f) Affects costs of raw materials or other operating costs
  - g) Influences rules and regulations related to our business
  - h) Other (please specify)
6. Relative to other business risks, what level of priority would you give to risks rising from climate change?
- a) High priority
  - b) Medium priority
  - c) Low priority
7. What factors limit your company's priority placed on climate-related risk? Please select all that apply.
- a) Pressure of short-term earnings that override longer-term sustainability issues
  - b) Lack of consensus or accountability from senior management and/or board of directors
  - c) Lack of regulatory or reporting requirements
  - d) Difficulty justifying the cost
  - e) Insufficient resources dedicated to internal sustainability initiatives
  - f) Other business risks, such as financial or COVID-related risks, that are more pressing
8. Does your business have a formal climate risk mitigation plan in place?
- a) Yes.
  - b) No, but one is being developed.
  - c) No, we have not had the opportunity to design a climate risk mitigation plan yet.

- d) No, we do not anticipate the need for such plan.
- e) Don't know

9. Which of the following initiatives, aimed at mitigating the impact of climate risk on your business, does your climate risk mitigation plan include? Please select all that apply.

- a) Greenhouse gas reduction targets
- b) Carbon neutrality/net-zero/net-positive emissions
- c) Internal carbon pricing
- d) Increasing renewable energy use
- e) Water usage reduction targets
- f) Installing climate control measures such as air conditioning
- g) Divesting fossil fuel assets
- h) Issuing green bonds
- i) Measuring the carbon footprint of our business
- j) Assessing climate-related risk to our business
- k) Increasing resiliency of supply chains to climate-related risk
- l) Making facilities more resistant to extreme weather events
- m) Relocating inland or away from climate change sensitive areas
- n) Other (please specify)

10. Please elaborate briefly on "**previous answer choice**" as part of your climate risk mitigation plan. What are its objectives, metrics, time horizons and the latest actions implemented? *(Note: Respondents will have the opportunity to answer this question once for each of the alternatives selected in question 9.)*

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11. In which of the following decision-making areas is climate risk an important consideration for your business? Please rank importance as indicated or choose "Don't know".

	Very important	Somewhat important	Not important	Don't know
a) Supply chain management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Business investments plans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Development and marketing of new products or services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Design of the overall corporate strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Recruitment of employees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Investor relations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Financing activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Financial and nonfinancial reporting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Public relations				

j) Other (please specify)

12. Please elaborate briefly on how climate change is taken into consideration in “**previous answer choice**”. (Note: Respondents will have the opportunity to answer this question once for each of the alternatives selected in question 11.)

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13. How important are each of the factors listed below in influencing your business to take climate change into consideration, if at all? Please rank importance as indicated or choose “Don’t know”.

	Very important	Somewhat important	Not important	Don’t know
a) Increased vulnerability to climate-related events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Reputational risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Demands from consumers/clients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Demands from investors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Top-down initiatives from senior management and/or board of directors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Government or state regulations and/or requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Talent recruitment and retention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Risk of reduced competitive edge among peers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. How does your company communicate your climate initiatives to various stakeholders, if at all? Please select all that apply.

- a) Publish sustainability reports using an existing and well-established framework (e.g. TCFD)
- b) Include it in our SEC filings or other financial reports
- c) Public initiatives or programs
- d) Direct communication from CEO, CSO, or other leadership figures
- e) Marketing campaigns
- f) Internal communications aimed at staff
- g) Other (please specify)
- h) N/A

### Section III. Sustainability-related Corporate Governance Measures

***The next few questions will give you a chance to elaborate on any sustainability-related business measures your firm might have implemented or is planning to implement, in the interest of ESG (Environmental, Social, and Corporate Governance), corporate social responsibility, or good corporate citizenship. You should answer these questions regardless of whether you expect to or currently observe any impacts on your business's revenues, costs, and investments from climate risk. Additionally, if you have a formal climate risk mitigation plan in place, we ask that your answers to the next few questions be given independently of such plan to the extent possible.***

15. Has your firm implemented any (additional) sustainability-related measures in the interest of ESG, corporate social responsibility, or good corporate citizenship?
- a) Yes
  - b) No
  - c) Not sure
16. Has your business implemented any of the (additional) sustainability-related measures listed below in the interest of ESG, corporate social responsibility, or good corporate citizenship? Please select all that apply.
- a) Increased use of energy-efficient technology and equipment
  - b) Reduced waste/increased recycling
  - c) Reduced water consumption
  - d) Switched to climate-friendly raw materials or office supplies
  - e) Reduced carbon emissions in the supply chain or logistics
  - f) Reduced business travel (even prior to COVID-19)
  - g) Required suppliers or contractors to meet certain sustainability criteria
  - h) Measured the carbon footprint of our business and/or employees
  - i) Advocated, or supported employees' calls, for sustainable policies externally or internally
  - j) Developed more sustainable products and/or services
  - k) Hired staff exclusively dedicated to sustainability
  - l) None of the above
  - m) Other (please specify)
17. Do you have any other lessons or perspectives that you would like to share on your company's climate change and/or sustainability initiatives? If yes, please elaborate.

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***Thank you for your participation in our Climate Risk Survey.***