

MINISTRY OF THE ENVIRONMENT

**Final Report on the
Monitoring and Assessment of
the National Adaptation Plan
to Climate Change
2016-2020 Cycle**



**Summary and analysis of the findings
from the survey conducted with the
business sector**



Federative Republic of Brazil

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MINISTRY OF THE ENVIRONMENT
SECRETARY OF CLIMATE AND INTERNATIONAL RELATIONS

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Brasilia
MMA
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The National Adaptation Plan (NAP), launched in May 2016, outlines four-year execution cycles with their respective revisions, according to the legal guidelines provided in the National Plan on Climate Change, featuring a monitoring and assessment system. As such, the [1st Monitoring and Assessment Report 2016-2017 of the NAP](#)¹ was made available in the second half of 2017. It provided information on the progress of national goals and guidelines for adaptation and allowed us to scale the existing challenges to fulfill the outlined objectives.

Between 2019 and 2020, in light of the completion of the First Cycle of the NAP, the MMA conducted dialogs and sponsored a survey in conjunction with public and private agencies and entities of qualitative and quantitative data focused on the strategic sectors of the NAP, including the business sector, thus providing the raw ingredients to prepare the Final Report on the Monitoring and Assessment of the National Adaptation Plan – 2016-2020 Cycle. The Final Report on the Monitoring and Assessment of the NAP (Final M&A Report of the NAP) seeks to assess the progress made on the goals and guidelines from 2016 to 2020. It also attempts to perform a final assessment of the First Cycle of the Plan in order to make the advances obtained in the sector-related and/or thematic strategies of the Plan during this period available to the Brazilian population.

In July of 2020, information began to be collected on the 13 sectorial and thematic strategies of the NAP, linked to the Federal Government. Given that the business sector took part in the process of building the NAP and possesses a significant potential to help implement the adaptation agenda, a specific dialog

1 1st Monitoring and Assessment Report 2016-2017 of the NAP is available at the MMA link: <https://www.mma.gov.br/images/arquivo/80182/GTm/RelatorioMonitoramento.pdf> Accessed on: november 11, 2019.


needed to be established with this sector through representative entities and networks to complement the Final Report on the Monitoring and Assessment of the NAP – 2016-2020 Cycle.

Accordingly, through the ProAdapta Technical Cooperation Project, technical consulting services were performed in order to gather information from the business sector. Pre-defined representative entities and forums were used, which served as support for preparing the Final Monitoring Report and Assessment of the NAP.

The “Support for Brazil in Implementing the National Agenda for Adaptation to Climate Change -ProAdapta” Project comes out of a partnership between the Brazilian Ministry of the Environment (MMA) and the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU, its acronym in German), within the context of the International Climate Initiative (IKI, its acronym in German) and implemented by *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*.

In order to facilitate the consultation process with the business sector and make sure they were engaged and would participate, a marketing email was sent to the companies to disclose the survey information. The selection of companies that took part in the process was done through partnerships with the primary representation networks in the business sector working on climate change, which selected and contacted the participating companies. As an instrument used to collect information from the business sector, a questionnaire was developed to gather data with the following objectives:

- a. understanding companies’ perceptions of the risks and impacts associated with climate change.
- b. identifying how companies have tackled the issue of adaptation to climate change.
- c. learning about the adaptation measures that companies have been implementing and their relationship with the First Cycle of the NAP.
- d. identifying how the Brazilian government can help the business sector implement this agenda.



Companies had the option to take part anonymously or to identify themselves, and they were also able to opt for the federal government to publish their best practices. Contributions from companies were accepted up to November 15, 2020, and the results obtained were soon thereafter analyzed, reported in aggregate, and made public through the Final M&A Report of the NAP.


REPORT OF THE PROCESS

Confidentiality of the business networks was important, so it was decided that the business networks themselves should conduct the dialog with their members and send out the e-mail marketing and participate in the consultation.

In order to align the way the consultation process with the business sector would be conducted, leveling meetings were held with the main business sector organizations (CNI and IEC, made up of CEBDS, CDP, FGV, Ethos Institute and Global Compact), the Ministry of the Environment (MMA), the hired consulting firm, and *GIZ*.

The companies had until November 15, 2020, to fill out and return the electronic forms. After this deadline, the information received was analyzed and processed by the project's consulting and technical team (MMA and *GIZ*) and later incorporated into the M&A Final Report of the NAP – 2016-2020 Cycle.



A stylized globe graphic composed of white and teal squares, set against a teal background. The globe is positioned in the upper left corner of the page.

The information presented in this report comes out of an aggregate analysis of responses from 56 companies taking part in the nationwide survey by completing an electronic form from October to November 2020, of which 27 identified themselves, and 9 companies request that their names not be disclosed in the report, and 29 chose to remain anonymous.

Of the 56 companies that participated in the survey, 82% are large, 11% micro and small and 7% mid-sized.

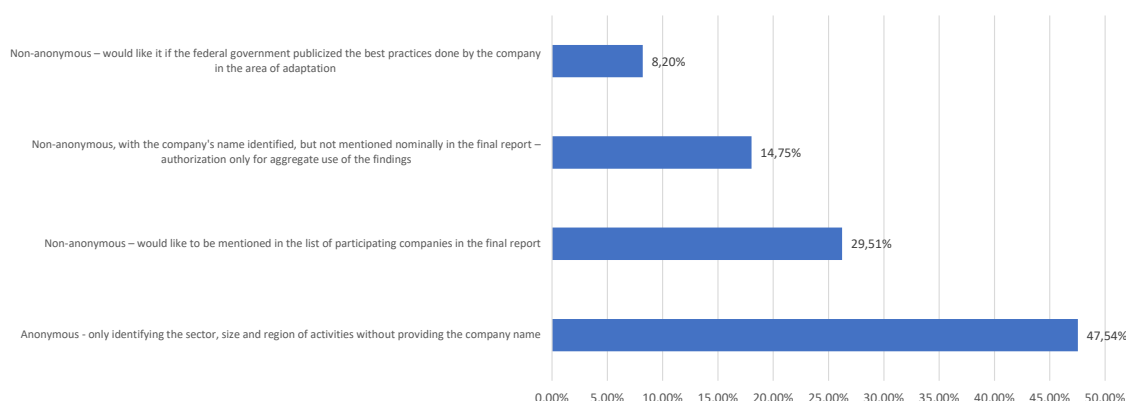
In terms of regions of activity, there was a relative balance between the South (24%), Southeast (24%), slightly lower for regions in the Northeast (21%) and Midwest (18%), and more tepid in the regions of the North (12%). A number of different industries were covered, including oil, gas and energy (16%), forestry (11%), electrometallurgical (11%), mineral (11%), services (9%), chemical industry (7%), civil construction (7%), cosmetics (5%), and others.



A total of 56 companies took part in the survey entitled “Business sector and adaptation to climate change: overview and assessment of the First Cycle of the National Adaptation Plan”. All the charts shown make a reference to the number of valid answers next to the title, called “n”. The cases where “n” equals 56 refers to questions to each participant could select only one option to answer. The cases where “n” is higher than 56 refer to multiple-choice questions, where each company could select as many answers as applied to its context.

Table 1 lists 56 of the responding companies and their names (when authorized), the way that each company uses authorized information, the networks each company is part of, and the authorization to share reported content with such networks. 48% of the companies responded to the questionnaire anonymously, as can be seen in Chart 1.

CHART 1 – WAY THAT COMPANIES TOOK PART IN THE INFORMATION COLLECTION (N=61)



Source: Survey conducted with the business sector. MMA, 2020.

TABLE 1 – COMPANIES RESPONDING TO THE SURVEY ON ADAPTATION TO CLIMATE CHANGE

Company	Company name	Way that information is used	Networks	Sharing authorization
1	Gobor (Transporter/Carrier)	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	GPMAI/PR	Yes
2	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CDP, FGVces, RBPG, CEBDS	No
3	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI, CDP, FGVces, RBPG, IE, CEBDS, ABBI	Yes
4	-	Non-anonymous, with the company's name identified, but not mentioned nominally in the final report – authorization only for aggregate use of the findings	CNI, FGVces	Yes
5	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CDP, FGVces, RBPG	Yes
6	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI	Yes
7	Braskem	Non-anonymous – would like to be mentioned in the list of participating companies in the final report Non-anonymous – would like it if the federal government publicized the best practices done by the company in the area of adaptation	CNI, CDP, FGVces, RBPG, CEBDS	Yes
8	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CDP, FGVces, RBPG, IE, CEBDS	Yes
9	Sabará Group	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CDP, RBPG, CEBDS	Yes
10	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI, OGCI	Yes
11	Aratu Mineração Construção Ltda.	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CNI	Yes
12	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI	Yes



Company	Company name	Way that information is used	Networks	Sharing authorization
13	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	FGVces	Yes
14	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	FGVces, RBPG	No
15	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	IE	Yes
16	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI	Yes
17	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI, CDP, RBPG, CEBDS	Yes
18	FURNAS	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CDP, FGVces, RBPG, CEBDS	Yes
19	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CDP, FGVces, RBPG, IE, IBÁ	No
20	-	Non-anonymous, with the company's name identified, but not mentioned nominally in the final report – authorization only for aggregate use of the findings	CNI, CDP, RBPG, IE, CEBDS	Yes
21	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	RBPG, IE	Yes
22	LED Licenciamento e Desenvolvimento Ambiental Ltda.	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	N/A	N/A
23	-	Non-anonymous, with the company's name identified, but not mentioned nominally in the final report – authorization only for aggregate use of the findings	FGVces (GHG Protocol)	No
24	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI, CDP, FGVces, RBPG, CEBDS	Yes
25	-	Non-anonymous, with the company's name identified, but not mentioned nominally in the final report – authorization only for aggregate use of the findings	FGVces	Yes



Company	Company name	Way that information is used	Networks	Sharing authorization
26	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	FGVces, RBPG, IE	No
27	Espaço Namata	Non-anonymous – would like it if the federal government publicized the best practices done by the company in the area of adaptation	FGVces	Yes
28	Centrais Elétricas de Santa Catarina - CELESC (Utility)	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CDP, FGVces, IE, GRI, ISE Bovespa	Yes
29	Toroid do Brasil Ltda.	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	N/A	N/A
30	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	FGVces	No
31	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	IE	Yes
32	Companhia Paranaense de Energia - Copel (Paraná Energy Company)	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CDP, RBPG	Yes
33	MRV Engenharia	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CDP, RBPG, IE	Yes
34	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	IE	No
35	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI, FGVces, RBPG, IE	Yes
36	-	Non-anonymous, with the company's name identified, but not mentioned nominally in the final report – authorization only for aggregate use of the findings	CDP, FGVces, RBPG, CEBDS, IBÁ	Yes
37	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	GAN	No
38	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CDP, FGVces, RBPG, IE, CEBDS	Yes
39	Enel Brasil	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CDP, FGVces, RBPG, IE, CEBDS	Yes



Company	Company name	Way that information is used	Networks	Sharing authorization
40	-	Non-anonymous, with the company's name identified, but not mentioned nominally in the final report – authorization only for aggregate use of the findings	FGVces, RBPG	Yes
41	Klabin S.A.	Non-anonymous – would like it if the federal government publicized the best practices done by the company in the area of adaptation	CDP, FGVces, RBPG	Yes
42	-	Non-anonymous, with the company's name identified, but not mentioned nominally in the final report – authorization only for aggregate use of the findings	FGVces	Yes
43	-	Non-anonymous, with the company's name identified, but not mentioned nominally in the final report – authorization only for aggregate use of the findings	CSI	No
44	Centrais Elétricas Brasileiras SA - Eletrobras	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CDP, RBPG, CEBDS, FBMC	Yes
45	Companhia Brasileira de Alumínio	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CDP, FGVces, RBPG, CEBDS, ABAL, Working Groups from the Environmental Chamber of Climate Change of the São Paulo Agreement	No
46	CMPC Brasil	Non-anonymous – would like to be mentioned in the list of participating companies in the final report	CDP, RBPG	Yes
47	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CDP, FGVces, RBPG, IE, CEBDS, COPPE/ UFRJ	No
48	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI, CDP, FGVces, RBPG, WSA	Yes
49	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CNI, CDP, RBPG	Yes
50	Itaipu Binacional	Non-anonymous – would like to be mentioned in the list of participating companies in the final report Non-anonymous – would like it if the federal government publicized the best practices done by the company in the area of adaptation	RBPG, Rede Global de Soluções Sustentáveis em Água e Energia (UNDESA)	Yes



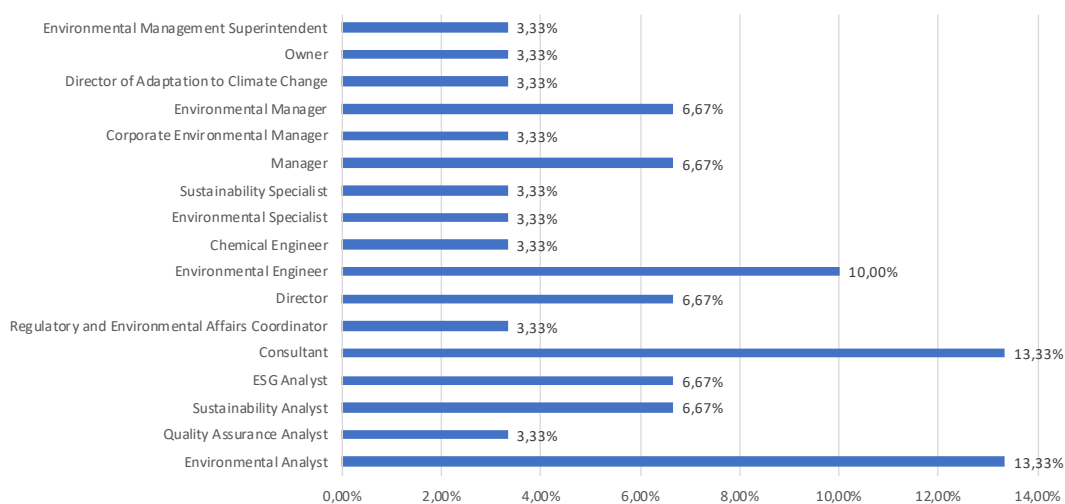
Company	Company name	Way that information is used	Networks	Sharing authorization
51	-	Non-anonymous, with the company's name identified, but not mentioned nominally in the final report – authorization only for aggregate use of the findings	CDP, FGVces, RBPG, IE	Yes
52	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	N/A	N/A
53	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	FGVces, CEBDS	Yes
54	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	Trade association	No
55	-	Anonymous - only identifying the sector, size and region of activities without providing the company name	CDP, Rede Brasil do Pacto Global, Instituto Ethos	No
56	Anglo American do Brasil	Non-anonymous – would like it if the federal government publicized the best practices done by the company in the area of adaptation	FGVces, Rede Brasil do Pacto Global, Instituto Ethos, CEBDS	Yes

Source: Survey conducted with the business sector. MMA, 2020.

PROFILE OF COMPANIES

The Chart 2 demonstrates the diversity of roles of respondents in each company. There was considerable input from environmental analysts, consultants and engineers, as well as employees at the level of superintendence, management and directors.

CHART 2 – ROLES OF SURVEY RESPONDENTS (N=30)

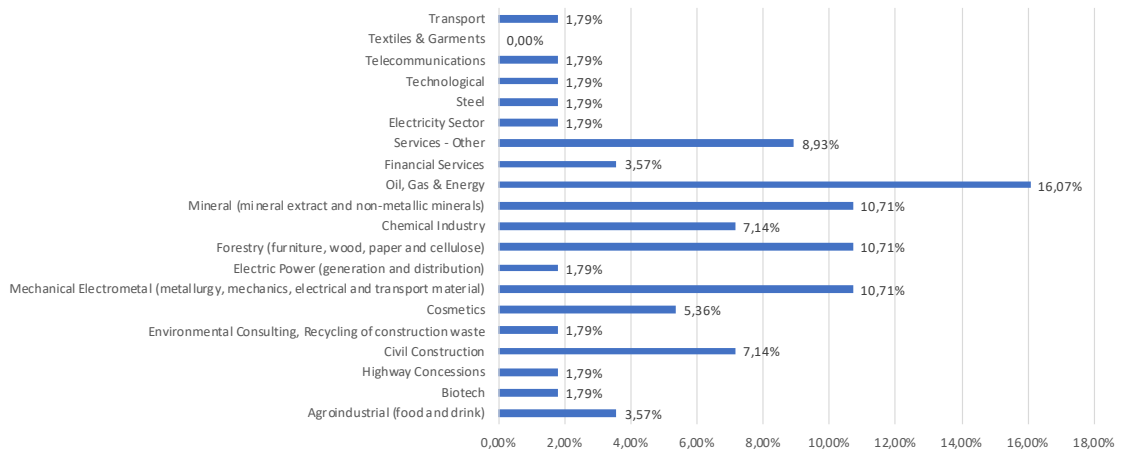


Source: Survey conducted with the business sector. MMA, 2020.



In terms of industrial activity (Chart 3), the most significant percentage was oil, gas and energy, with 16% of responses. Next was the forestry, electrometallurgical and mineral sectors, representing 11% of the responses each, and the service area, with 9% of the replies. The chemical industry and civil construction segments received 7% of the participating responses each, and the cosmetics industry saw 5%. The other areas listed represented less than 5% of the responses each.

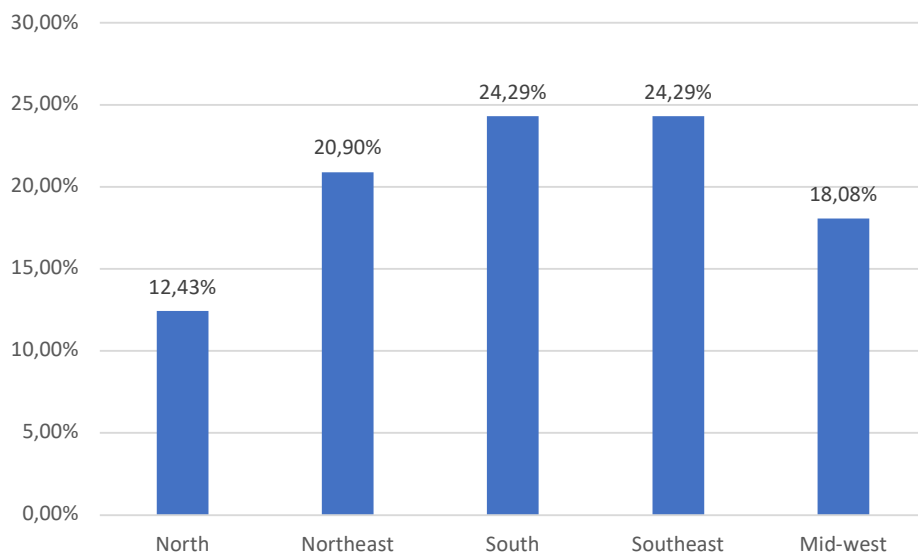
CHART 3 – SECTORS WHERE THE COMPANIES ARE ACTIVE (N=56)



Source: Survey conducted with the business sector. MMA, 2020.

In terms of regions of activity, the majority of companies operate in the South (24%), Southeast (24%) and Northeast (21%) regions. The Midwest (18% of the mentions) and North regions had fewer mentions (12% of the answers), but they were still represented in the survey.

CHART 4 – REGIONS WHERE THE COMPANIES ARE ACTIVE (N=177)

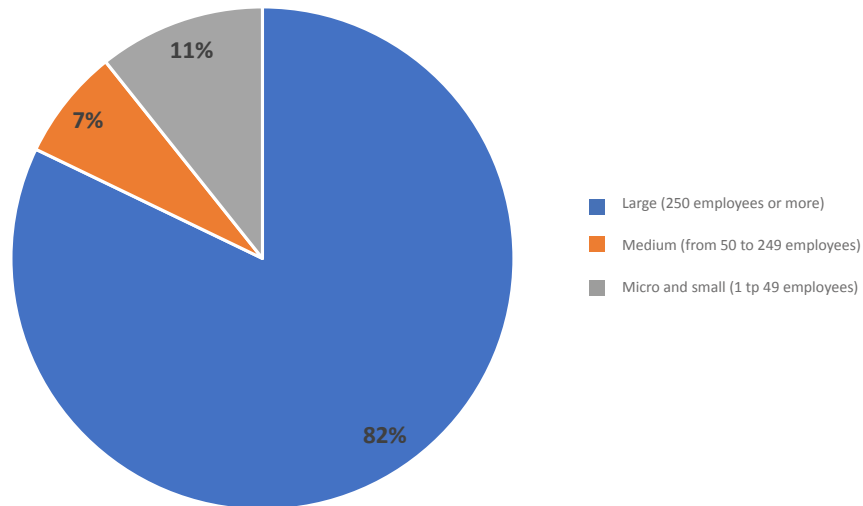


Source: Survey conducted with the business sector. MMA, 2020.



In terms of business size (Chart 5), categorized according to the number of employees, there was a higher share of large companies, representing 82% of the responding companies. Next came micro and small companies, with 11% of the responses, and medium-sized companies, with 7% of the responses.

CHART 5 – SIZE OF THE COMPANIES (N=56)



Source: Survey conducted with the business sector. MMA, 2020.

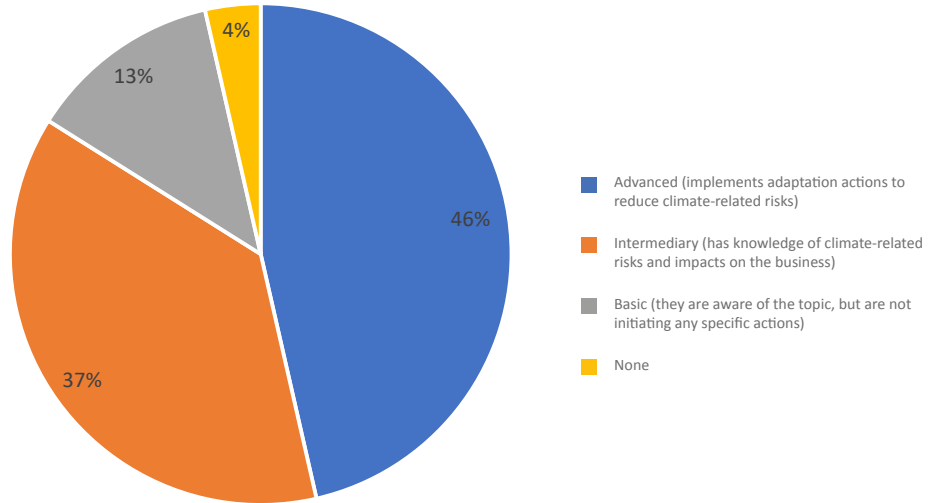
PERCEPTION OF RISKS AND IMPACTS ASSOCIATED WITH CLIMATE CHANGE

Starting off with a set of questions concerning the perception of risks and impacts associated with climate change, the companies were asked about their level of knowledge on the subject of adaptation to climate change (Chart 6). 4% of the companies declared that they had no familiarity with the subject, 13% of companies said they had a basic level of understanding, 37% intermediate and

46% advanced. The prevalence of companies with advanced knowledge of the subject may be related to the significant presence of large-scale companies taking part in the research. It's important to note that advanced understanding of adaptation to climate change does not necessarily reflect the reality on a national level, but the reality of the sample included in the survey.



CHART 6 – LEVEL OF KNOWLEDGE COMPANIES HAVE ON THE ISSUE OF ADAPTATION TO CLIMATE CHANGE (N=56)

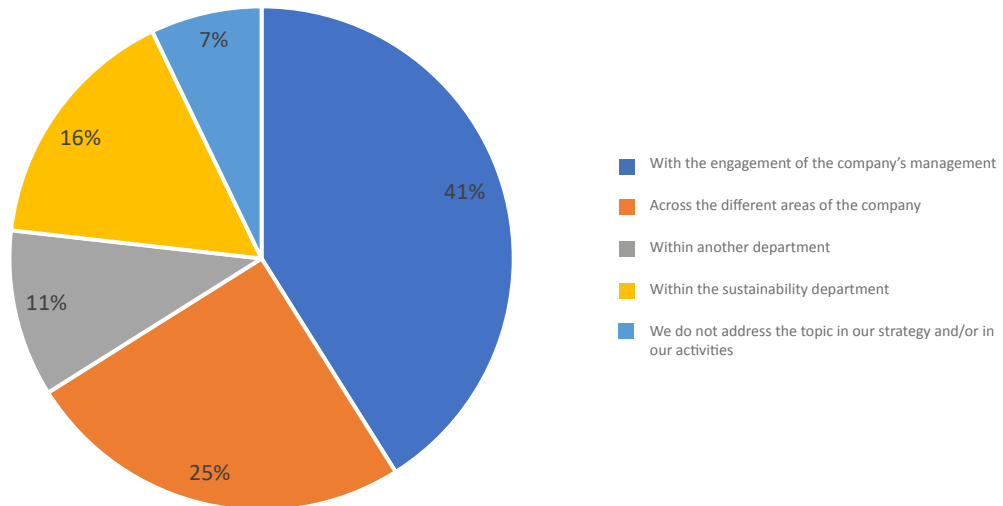


Source: Survey conducted with the business sector. MMA, 2020.

As for the way companies approach climate change adaptation (Chart 7), there was a prevalence of companies reporting senior management engagement, with 41% of respondents. 25% of the companies stated that they address the issue in

a cross-cutting way, 16% within the sustainability department and 11% inside other departments. 7% of the companies claimed they did not include the topic in their strategies and/or activities.

CHART 7 – APPROACH TO THE ISSUE OF ADAPTATION TO CLIMATE CHANGE AT COMPANIES (N=56)



Source: Survey conducted with the business sector. MMA, 2020.

Again, the majority of companies addressing the issue with a commitment from upper management and companies addressing the issue across the board is possibly related to the profile of respondents, which are mostly large-scale companies who reported having extensive knowledge of the

subject. Engagement by senior management and mainstreaming the topic into various departments throughout the company, addressing climate change as a lens and not as an area, can be viewed as best practices.

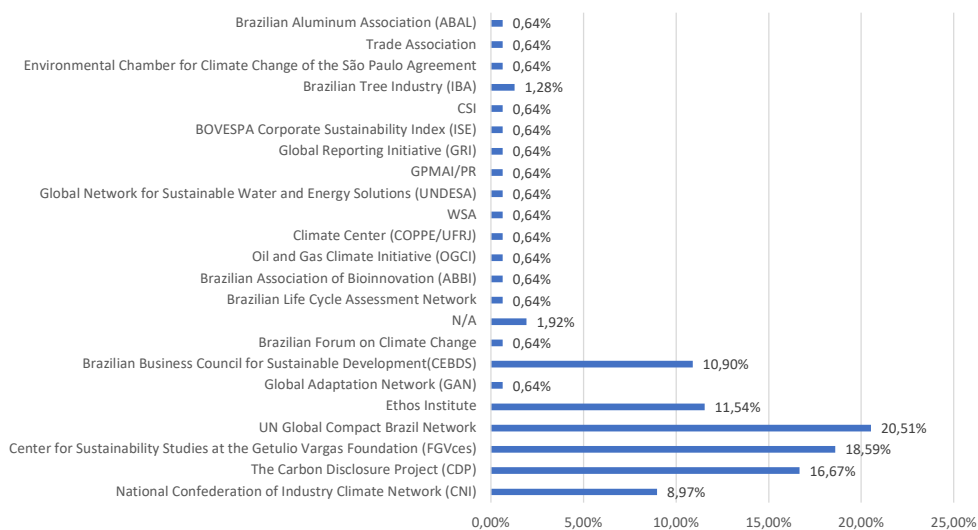


Meanwhile, dealing with the topic within a specific area, usually the sustainability department, is more common in companies that possess a basic or intermediate understanding of the issue. Accounts from companies that have not yet tackled the issue could be because micro and small-scale companies do not have the human capital available to address the issue due to their relatively stripped-down staff. Despite representing the lowest percentage of responses to the survey, this business profile is taken into account when defining the next steps of

the agenda at the national level, attempting to raise awareness and engage small and medium-sized enterprises (SMEs) in the subject of adaptation to climate change.

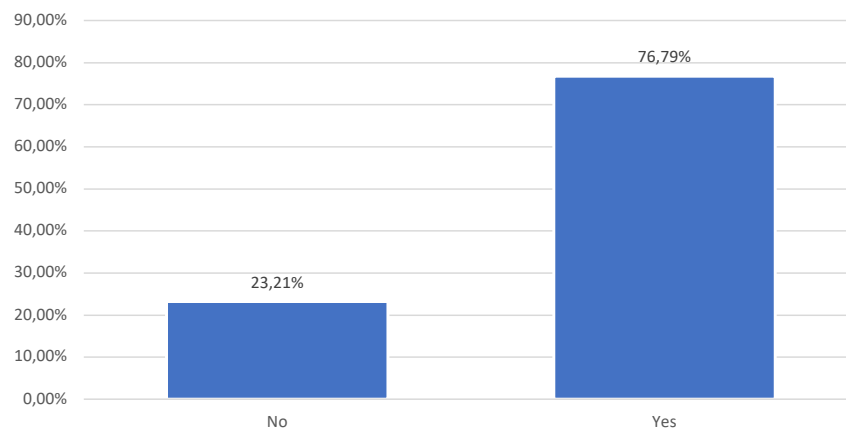
The Chart 8 systematizes all networks addressing the issue of adaptation to climate change that were mentioned by the companies, previously systematized in the Table 1. As shown in Chart 9, 77% of companies authorized the sharing of their answers with the networks they are part of.

CHART 8 – NETWORKS DEALING WITH THE ISSUE OF CLIMATE CHANGE ADAPTATION (N=156)



Source: Survey conducted with the business sector. MMA, 2020.

CHART 9 – AUTHORIZATION TO SHARE CONTENT WITH NETWORKS (N=56)



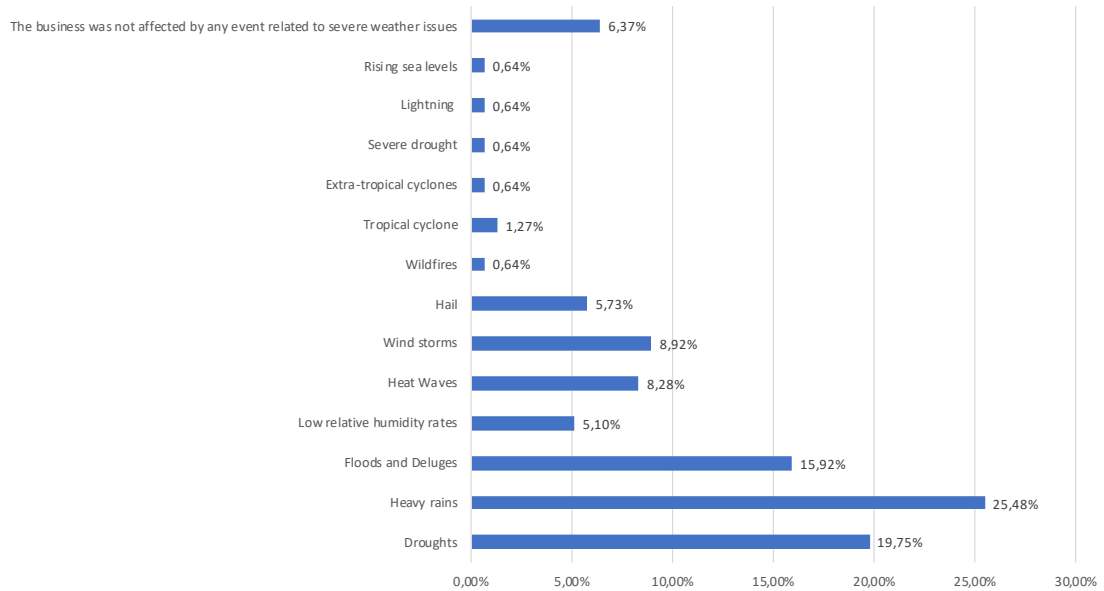
Source: Survey conducted with the business sector. MMA, 2020.

In retrospect, the extreme event that most affected business for the companies taking part in the survey (Chart 10) was heavy rain, with 25% of the mentions. Right below that, but still with significant relevance,



droughts (20%) and floods (16%) were also mentioned. To a lesser scale, other weather events indicated included windstorms (9%), heat waves (8%), hail (6%) and low levels of relative humidity (5%). 6% of companies reported not having been affected by any type of extreme weather event over the last five years.

CHART 10 – EXTREME EVENTS AFFECTING BUSINESSES OVER THE LAST FIVE YEARS (N=157)



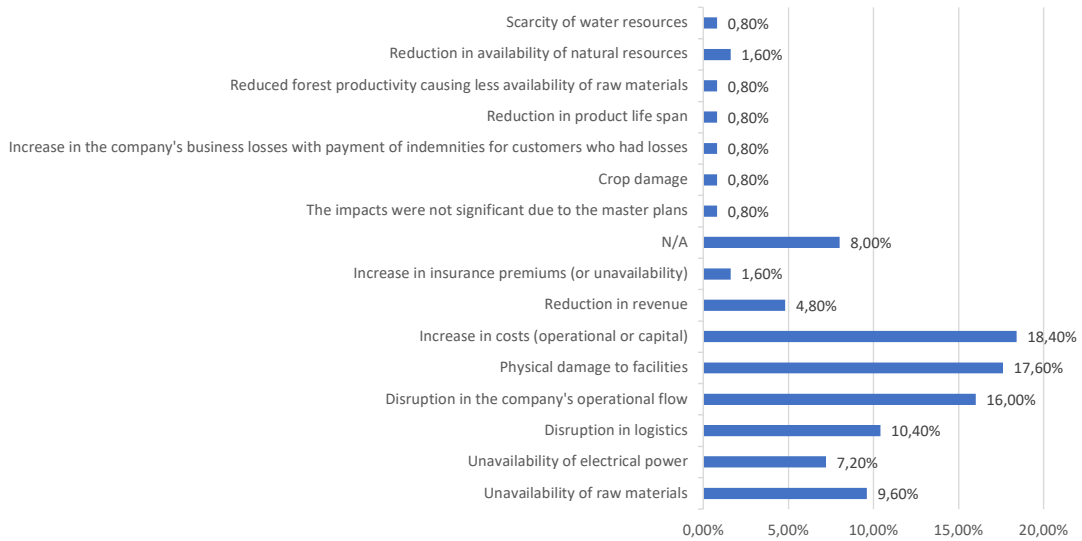
Source: Survey conducted with the business sector. MMA, 2020.

As seen in Chart 11, the economic impacts included an increase in costs (operational or capital) and the physical damage to facilities, with 18% of the responses each, and a disruption in the operational flow of the company (16%). Next, with a lower number of mentions, are interruptions in logistics (10,4%), the unavailability of raw material (9.6%), the unavailability of electricity (7.2%) and a drop

in revenues (4.8%). Finally, there were some mentions of the scarcity of water resources, lower forest productivity - resulting in reduced availability of raw materials, decreased useful life of the asset (for example, a reservoir), increased incidents, higher or unavailability of insurance premiums, and damage to crops. Only 0.8% of the sample stated that the impacts that had occurred were not significant.



CHART 11 – IMPACTS OF EXTREME WEATHER EVENTS ON BUSINESSES (N=125)

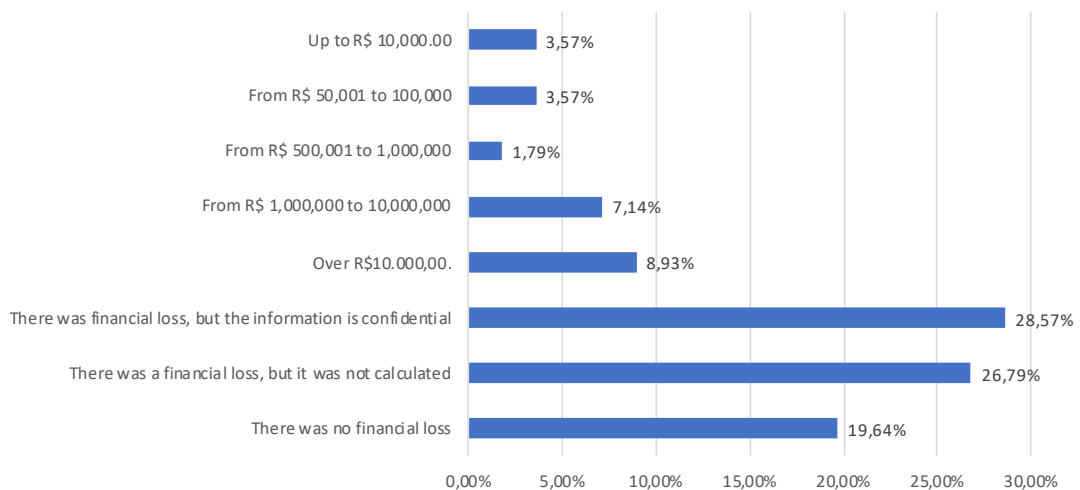


Source: Survey conducted with the business sector. MMA, 2020.

When it comes to the magnitude of financial losses suffered that were related to extreme weather events (Chart 12), 26.79% of the companies reported that there was financial damage, but this amount was not measured. This relatively high percentage was expected and representative of the reality most companies face, given that there is still a lack of an established culture of management and monitoring for extreme weather events

and, above all, translating this information into a financial language. This information is extremely relevant, as failure to measure the financial loss related to the impacts of climate change makes it difficult to quantify the risk and express it in a business language, as well as hindering the company's own awareness of the importance of climate management.

CHART 12 – FINANCIAL LOSS RELATED TO EXTREME WEATHER EVENTS (N=56)



Source: Survey conducted with the business sector. MMA, 2020.

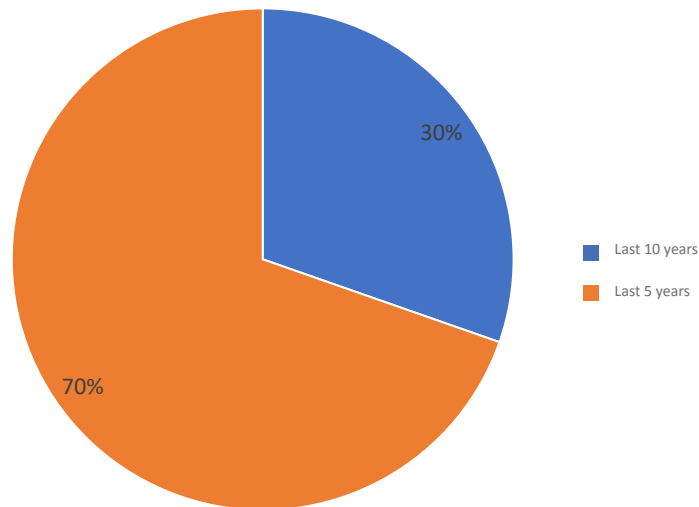


Another 28.57% of companies also mentioned that there were financial losses related to extreme weather events, but the magnitude was not disclosed because it was considered confidential information. 19.64% of the companies reported that there was no related financial loss. The over R\$ 10 million range received 8.93% of mentions, followed by the range of R\$ 1 million to 10 million, which received 7.14% of the mentions, the ranges from

R\$ 50,000 to 100,000 and up to R\$ 10,000 received 3.57% of the mentions each, and the range of R\$ 500,000 to 1 million was cited 1.79% of the time.

For the companies that described some type of financial loss, 70% viewed the last 5 years, while 30% were looking at the last 10 years (Chart 13).

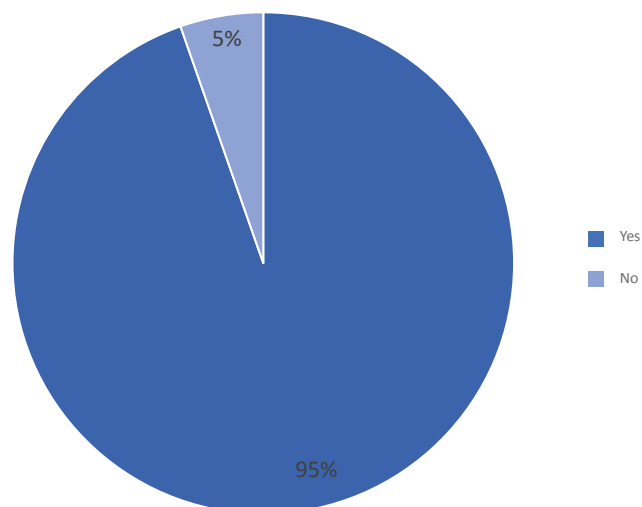
CHART 13 – TIME HORIZON OF FINANCIAL LOSS (N=56)



Source: Survey conducted with the business sector. MMA, 2020.

Looking ahead, 95% of companies taking part in the survey believe that their business could be affected by severe weather conditions in the future, while only 5% of companies believe that they will not be impacted (Chart 14).

CHART 14 – NOTIONS ABOUT SEVERE WEATHER CONDITIONS AFFECTING BUSINESSES IN THE FUTURE (N=56)



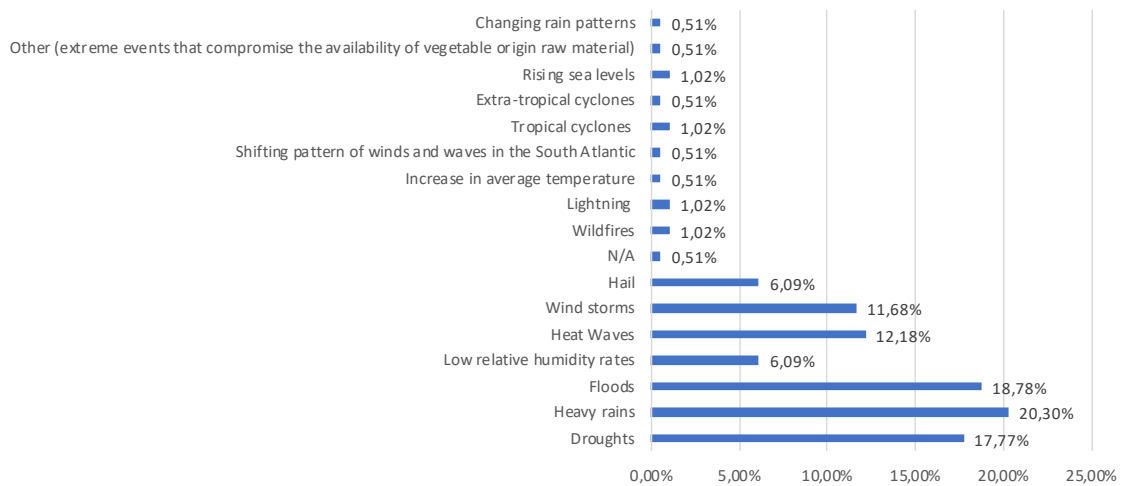
Source: Survey conducted with the business sector. MMA, 2020.



For companies that believe that their business may be affected by severe weather conditions in the future, the weather events considered the most impactful (Chart 15) included: heavy rains (20%), floods (19%), and droughts (18%). All three related to water resources. Following that, two other extreme climate events considered to have an impact on business in the future are heat waves and windstorms (12% each). A third block of extreme events that had been cited, albeit less frequently, were hail and low levels of relative humidity (6%

each). Generally, the extreme weather events that were thought to have the potential to be most disruptive to business in the future are the same ones considered to have the greatest impact on business over the last several years. Finally, more sporadic mentions (between 1.02% and 0.51%) included a number of different extreme events, such as rising sea levels, hurricanes, lightning, wildfires, rising average temperatures, shifts in rainfall patterns, extratropical cyclones, changes in wind patterns, and waves in the South Atlantic.

CHART 15 – WEATHER EVENTS PERCEIVED AS HAVING THE GREATEST IMPACT ON BUSINESSES IN THE FUTURE (N=197)



Source: Survey conducted with the business sector. MMA, 2020.

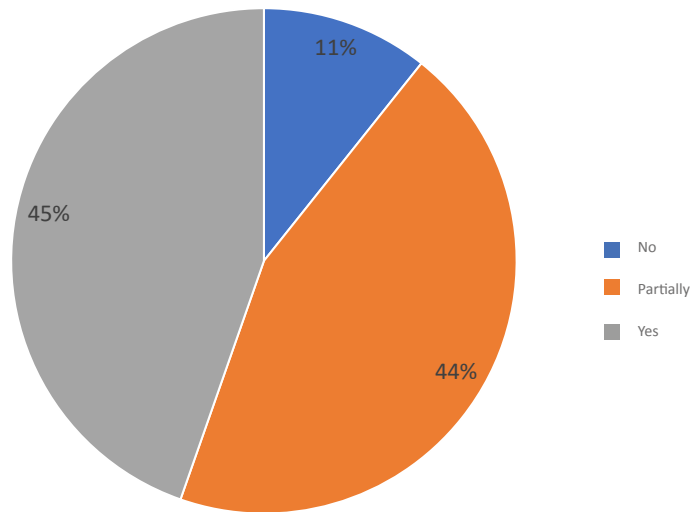
IMPLEMENTATION OF CLIMATE CHANGE ADAPTATION MEASURES

The vast majority of companies taking part in the survey (89%) stated that they were somewhat aware of the National Adaptation Plan (NAP) (Chart 16), with 45% mentioning that they know the NAP

and 44% being partially aware of it. Only 11% of the companies in the sample don't know anything about the NAP.



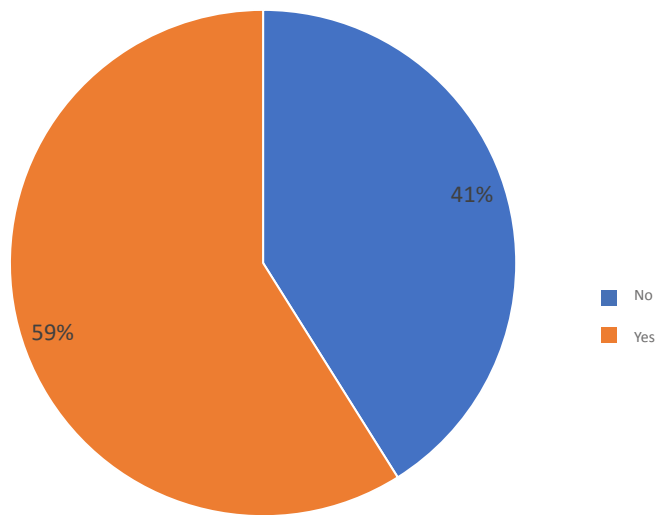
CHART 16 – KNOWLEDGE ABOUT THE NATIONAL ADAPTATION PLAN (NAP) (N=56)



Source: Survey conducted with the business sector. MMA, 2020.

59% of the companies participating in the study confirmed that they have an adaptation plan or strategy to deal with the impacts of climate change, while 41% of the companies still do not, as shown in Chart 17.

CHART 17 – COMPANIES THAT HAVE AN ADAPTATION PLAN OR STRATEGY TO ADDRESS THE IMPACTS OF CLIMATE CHANGE (N=56)



Source: Survey conducted with the business sector. MMA, 2020.

Despite the fact that only 59% of the companies have a structured plan or strategy to address the issue of adapting to climate change, 77% of the companies participating in the survey claim that they have already adopted some adaptation measure to deal with the impacts of climate change. This could mean that some companies, while not equipped with an official

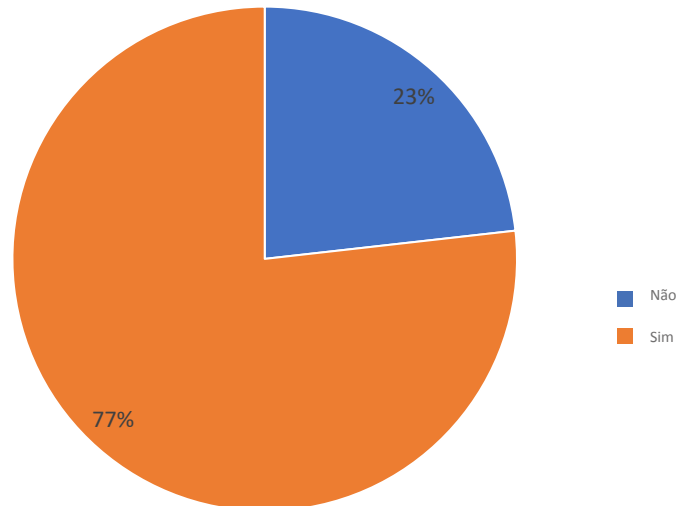
structured strategy, are already taking some type of adaptation measures, even if it is only occasional (Chart 18). It's important to point out that decision making related to adaptation measures are always based on a technical foundation (there are a number of factors that can be taken into consideration, such as: cost-effectiveness, response time, co-benefits



produced) and are not just adopted randomly, in an effort to provide the best outcome for both the company's business and to increase local resilience. Only

23% of the companies taking part in the survey have not yet adopted any type of measure.

CHART 18 – ADOPTION OF CLIMATE CHANGE ADAPTATION MEASURES (N=56)



Source: Survey conducted with the business sector. MMA, 2020.

For companies reporting that they are undertaking some adaptation measure, Table 2 compiles all climate change adaptation measures reported in the survey.

TABLE 2 – KEY ADAPTATION MEASURES IMPLEMENTED BY THE COMPANIES TAKING PART IN THE SURVEY

Key adaptation measures implemented by the companies
100% renewable energy
Automating plants that are part of the energy generation park in the company's own hydroelectric plants. Automating the electric power distribution system, done through remote-controlled reclosers, allowing the load to be redistributed remotely among feeders.
Clinker addition and substitutes
Water reuse
Expanding the supply chain Agro-forestry cultivation and recovery of riparian forests.
Seeking autonomy in the supply of raw water
Seeking further sources of raw material supply
Alternative Fuels
Purchasing low carbon energy
Preserving ecosystems and biodiversities
Flood containment through sumps, slope revegetation
Creating and maintaining permanent preservation areas, an extended protection strip along the banks of the reservoir, and forest restoration of degraded areas, including conservation of key components of native and endangered fauna.
Developing repositioning studies of the forest base focusing on productive potential and environmental risk, taking the threats of climate change into account. Continuous investment in research projects.



Key adaptation measures implemented by the companies

Diversification of the energy matrix
Energy Efficiency – Processes Description: Streamlining processes through RAN Sharing.
Energy Efficiency – Processes Description: Replacement of machinery. Shutting down and removing equipment from industrial buildings and sites in order to realize energy savings, environmental efficiency and floor space that is freed up for new projects. The entire decommissioning process is fully in tune with the planned strategy of replacing obsolete technologies with modern technologies, thereby attaining improved energy performance and environmental costs.
Energy Efficiency – Processes. It includes the temporary or permanent shutdown of idle equipment, only retaining vital redundancies to maintain the stability and security of operational processes.
Preparing a methodology to assess vulnerabilities to climate risk that the company's projects face at the plant level, focusing on operations, maintenance and physical adaptation of the project to increase climate resilience.
An identification and assessment study (including financial impacts) of climate risks and opportunities in an effort to incorporate climate risks into the company's risk management, along with the strategic and financial planning. This study follows the recommendations by the TCFD [Task Force on Climate-related Financial Disclosures].
Economic and structural feasibility study
Study, monitoring and application of open and closed tools that provide strategic information on the climate to be incorporated into the company's assessments of business risks.
Studies and incorporation of new clauses for businesses to cover risks associated with climate change as a protective measure for policyholders and resilience against the materialization of risks
Meteo-oceanographic studies to help offshore platform engineering projects, fine-tuning the design parameters.
Studies to identify and assess the vulnerability of business activities to climate change
Improve infrastructure for greater resilience to extratropical hurricane and cyclone disasters
Electric power generation from wind farms
Electric power generation from photovoltaic parks
Generating proprietary electric power in order to operate the factory and selling surplus energy to local homes
Territorial Environmental Management by Drainage Basin: improves green infrastructure and ecosystem services associated with watersheds in the Reservoir's direct area of influence
Identifying new water catchment sources (severe droughts)
Implementing a protected, isolated electrical distribution grid. Preventive pruning and mowing of vegetation close to the grid.
Implementing new techniques to prevent the depletion of natural resources
Deploying a unit based on the Green Bound Principles
Implementing the sustainable procurement system - Manual
Initiatives related to water stress and depletion in bodies of water where we draw water for our industrial operations. Procuring a PCH (Small hydro power plant) that helps regulate water flow, constructing a range of reservoirs, contingency plans established with a number of alternative measures, setting up a contingency budget, permanently running projects and initiatives to maximize the internal reuse and recirculation of water in various processes, establishing a long-term public commitment to reduce water collection in industrial operations.
Innovating product development and negotiating with the market to consider new scenarios involving global concern over climate change.
Installing translucent tiles in the factory environment
Investing in wind energy to diversify the matrix, given the risk of reducing hydroelectric production.
Investing in forestry research by testing (for example) different pine and eucalyptus materials, which are more resistant to water deficiencies or pests.
Investments in energy projects - reducing consumption



Key adaptation measures implemented by the companies

Socio-biodiversity Line
Continuing the genetic improvement program with strategies for selecting plastic clones that are tolerant to adverse conditions, as well as to rollout risk mitigation strategies (for example: Clonal compound). Continuous investment in research and development in the genetic improvement of eucalyptus. Defining and maintaining an improvement strategy (e.g., synthetic mini-population) designed to sustain a genetic base and the introgression of genes that are resistant to key pests, diseases and environmental disturbances. We reviewed the breeding strategy and focused on developing synthetic populations to maintain the genetic base and favorable resistance genes.
Preservation of a 4,623.75 hectare green area where the Power Generation Plant owned by the company is located.
Adaptation measures related to water security related to refining and thermal electric power generation.
Improving the production process and design of new projects involving the generation, transmission and distribution of energy.
Goal for renewable energy consumption; Water management goal according to local conditions; Goal to substitute raw materials with high pollutant content or emissions or that could pose a future risk; goal of including packaging into the circular economy.
Monitoring rainfall, methodology to plan and re-plan the execution of projects to minimize the effects of extreme weather events.
Meteorological monitoring and studies - Currently, the company has 89 meteorological stations and accesses data from public stations (Inmet). It also has partnerships with companies specialized in meteorological monitoring and studies. The data collected and analyzed each day serves as inputs for the analysis of disturbances in productivity and in the overall sowing, management, strategy of cultivation, irrigation recommendations, fertilization, and to compose a base and historical series of phenomena that help in future climate forecasts.
Sustainable Businesses
Authorization and installation of groundwater wells to provide water security in the event of a drought.
Research and development of genetic bases for improving seedlings
Crisis plan to assist policyholders, including increased support capacity for the entire cycle involving claims
Preservation of the Atlantic Forest, control of urban erosion, research into new products
Green products
Climate adaptation project to prioritize actions.
Energy efficiency project
Research and Development Project for Adapting Power Lines
Reforestation of degraded areas
Related to the risk of water scarcity - Integrated/adaptive management of water resources, with measures to reduce water consumption and to increase reuse. Diversification study on water sources, including reuse.
Resilience of the electric power distribution grid
Reuse of industrial water
Strategic review of the business to incorporate new technologies and diversify the energy matrix
Routing deliveries to diminish fuel consumption
Water Security
Replacing the energy matrix
Use of solar energy in 27 of the company's buildings in Brazil and introduction of a Sustainable Consortium Product to encourage access to credit for customers (individuals and corporate) to install solar energy generation systems
Use of a cleaner energy matrix
Efficiency (water and energy)



Key adaptation measures implemented by the companies
Diversification in the energy matrix
Reduction of the environmental impact of products through the implementation of a lifecycle analysis tool
Promoting the use of sustainable renewable raw materials
Conservation of the Biodiversity
Use of renewable energy
Recovery of degraded areas and PPAs (permanent preservation areas)
Encouraging research for biodiversity conservation

Source: Survey conducted with the business sector. MMA, 2020.

Mentions of actions that were clearly associated with climate change mitigation rather than adaptation were excluded from the list. Some examples:

- Preparing the Inventory of Greenhouse Gas Emissions (GHG).
- Reduction/neutralization of emissions and a calculation of financed emissions.
- Revision of targets for greenhouse gas emissions.
- Recycling of construction waste.
- Replacing conventional light bulbs with LED bulbs throughout the company.
- Reducing the emission of greenhouse gases from our activities by improving the energy efficiency of our website.
- Provide support to our strategic suppliers in reducing their direct emissions .
- Management, monitoring of greenhouse gas (GHG) emissions and deploying projects focused on reducing GHG emissions and energy consumption.

Other actions were kept on the list as it was not possible to determine if the final objective related to the measure was focused on mitigating or adapting to climate change, in the absence of an expanded contextualization of the responses. Some examples:

- Reduction of fuel consumption/ energy efficiency project/ use of renewable energy (could be designed to either reduce emissions

or reduce the company's dependence on a specific raw material).

- Preservation of green areas (can be a way of offsetting emissions or could act as an ecosystem-based adaptation measure).
- Implementing a sustainable procurement system (there are no details on whether procurement criteria includes criteria related to adaptation).

By and large, a few recurrent themes addressed by adaptation measures Table 2 can be extracted, which are: expanding the supply chain, searching for alternative sources of raw materials, searching for water autonomy and other measures to ensure water security (ex: reuse), conservation of ecosystems and biodiversity, forest restoration, diversification of the energy matrix, energy generation from alternative sources (such as solar, wind), risk analysis, development of studies (scientific and financial), innovation in product development, and developing crisis plans.

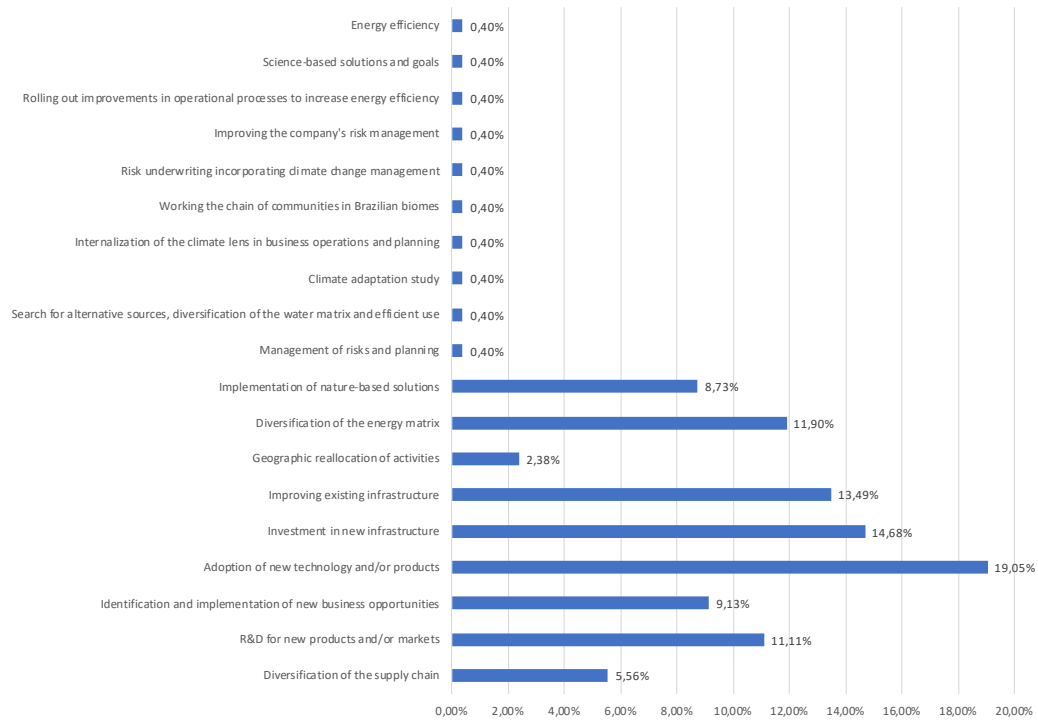
In terms of the **classification of adaptation measures that companies have deployed** (Chart 19), the top categories include: the adoption of new technologies and/or products (19%), investments in new infrastructure (15%) and improvements on existing infrastructure (13%). A second set of adaptation measures that were also widely implemented includes the diversification of the energy matrix (12%) and R&D for new products and/or markets (11%). A third block of most common measures involves the identifying and deploying new business opportunities (and implementing nature-based solutions (9% each). A fourth block of less frequently



cited adaptation measures involves the diversification of the supply chain (6%) and the geographic reallocation of activities (2%). Lastly, there were one-off mentions (0.40% each) of actions that included: energy efficiency, implementation of improvements in operational processes, improvement

in risk management, internalization of the climate lens in operating and planning the business, climate adaptation studies, solutions and goals based on science, searches for alternative sources and the diversification of the water matrix, and working in the chain of communities in Brazilian biomes.

CHART 19 – CLASSIFICATION OF CLIMATE CHANGE ADAPTATION MEASURES (N=252)



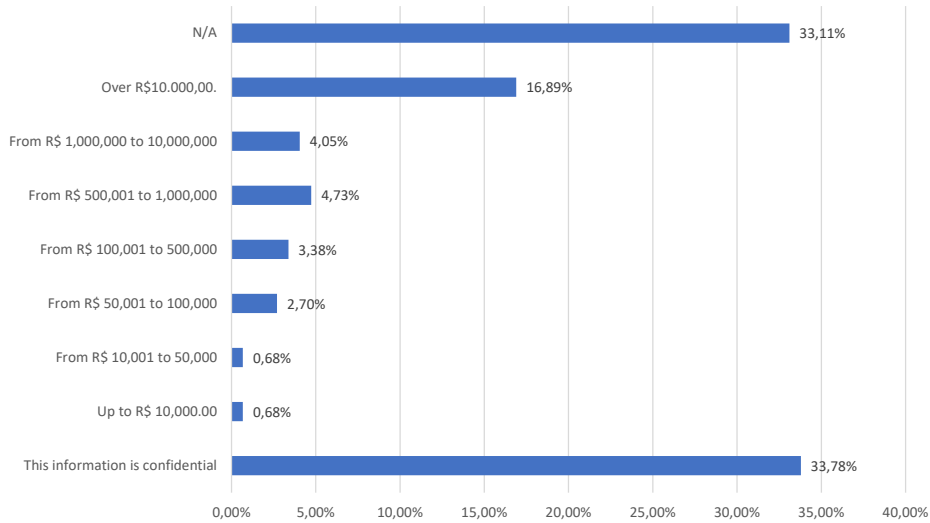
Source: Survey conducted with the business sector. MMA, 2020.

As for the **costs/investments associated with rolling out climate change adaptation measures** (Chart 20), the vast majority of responses collected state that this information is confidential (34%). Nevertheless, among the dimensions of costs/investments cited, most mentions (17%) are just north of

R\$ 10 million. Lesser amounts included R\$ 500,000 to 1 million (5%); R\$1 million to 10 million (4%); R\$ 100,000 to 500,000 (3.4%); R\$ 50,000 to 100,000 (3%); and R\$ 10,000 to 50,000 and up to R\$ 10,000 (0.68% each).



CHART 20 – COSTS/INVESTMENTS ASSOCIATED WITH ROLLING OUT CLIMATE CHANGE ADAPTATION MEASURES (N=148)

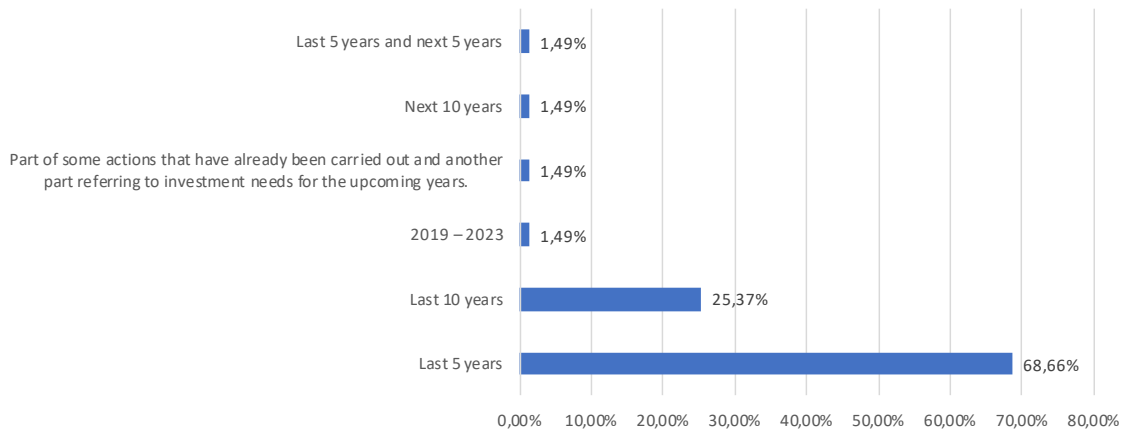


Source: Survey conducted with the business sector. MMA, 2020.

It is worth pointing out that a good portion of the companies taking part in the survey are large-scale companies (82%), which may be related to the dollar amounts that appeared more frequently. Another relevant point to keep in mind is that, despite not having been explored in the survey, the benefits associated with the implementation of adaptation measures over the long term are, for the most part, greater than the costs of their implementation. It therefore makes more sense to use the term “investment”, since there will be a “return” over the long term associated with the implemented measures.

In relation to the **time horizon of costs/investments in adaptation measures** to climate change (Chart 21), most (68.66%) of the reports cover the period of the last five years. Next was the time frame for the last 10 years (25.37%). There were occasional mentions (1.49% each) also to other time ranges, such as the last and next five years, and the next 10 years. There were investments made not only in recent years but also investments planned to take place over the next few years.

CHART 21 – TIME HORIZON OF COSTS/INVESTMENTS IN CLIMATE CHANGE ADAPTATION MEASURES (N=67)



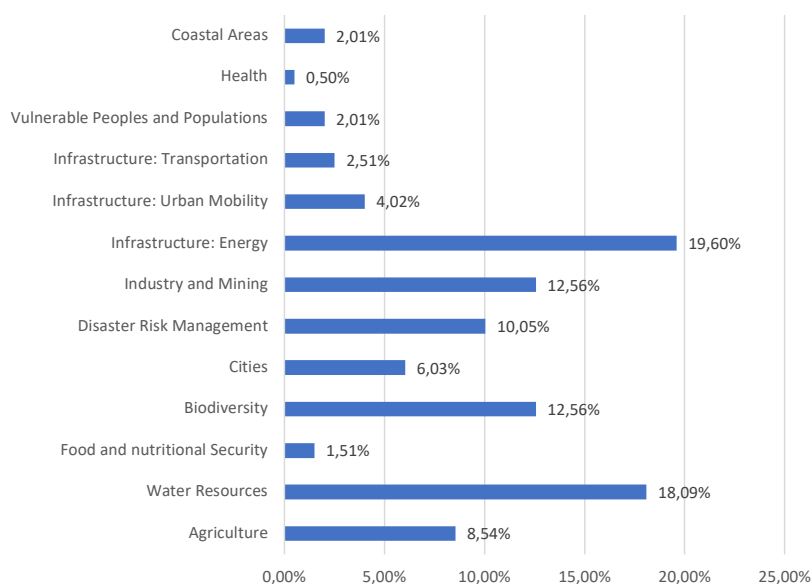
Source: Survey conducted with the business sector. MMA, 2020.



As for the correlation between adaptation measures implemented by companies with the sectors of the NAP (Chart 22), the key sectors mentioned included: infrastructure, energy (19.6%) and water resources (18.09%). A second block that also has a significant amount of mentions involves the sectors of biodiversity and industry and mining (both with 12.56%). The sectors of disaster risk management

and agriculture came to 10.05% and 8.54%. The other sectors of the NAP were mentioned much less frequently and include, in descending order: infrastructure: urban mobility (4.02%), infrastructure: transport (2.51%), vulnerable peoples and populations (2.19%), coastal areas (2.01%), food and nutrition security (1.51%), and finally, health (0.50%).

CHART 22 – SECTORS FROM THE NATIONAL ADAPTATION PLAN (NAP) RELATED TO ADAPTATION MEASURES IMPLEMENTED BY COMPANIES (N=199)



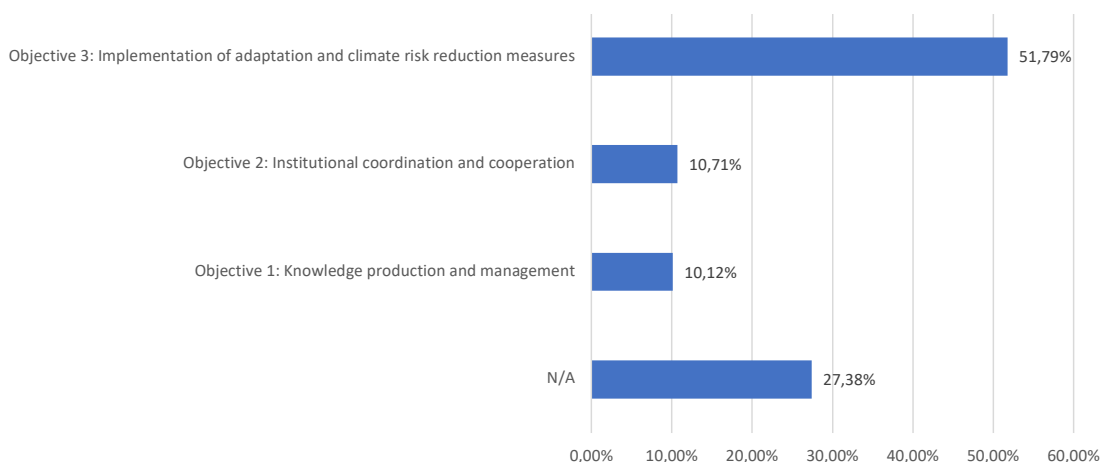
Source: Survey conducted with the business sector. MMA, 2020.

The prevailing relationship between adaptation measures and the sectors of energy and water resources may be due to the fact that the major extreme weather events affecting business in the last five years were heavy rains, droughts, and floods. Events that can result in a disrupted energy supply, reduction of water availability in suitable quantities and/or quality, and others.

In relation to **the objectives of the NAP** (Chart 23), the measures implemented are mainly related to objective 3 – implementation of adaptation measures and reduction of climate risk (52% of responses). The relationship with objectives 1 – knowledge production and management – and 2 – coordination and institutional cooperation – received, respectively, 10% and 11% of the mentions, but in a much lower quantity than the mentions of objective 3.



CHART 23 – OBJECTIVES OF THE NATIONAL ADAPTATION PLAN (NAP) RELATED TO ADAPTATION MEASURES IMPLEMENTED BY COMPANIES (N=168)



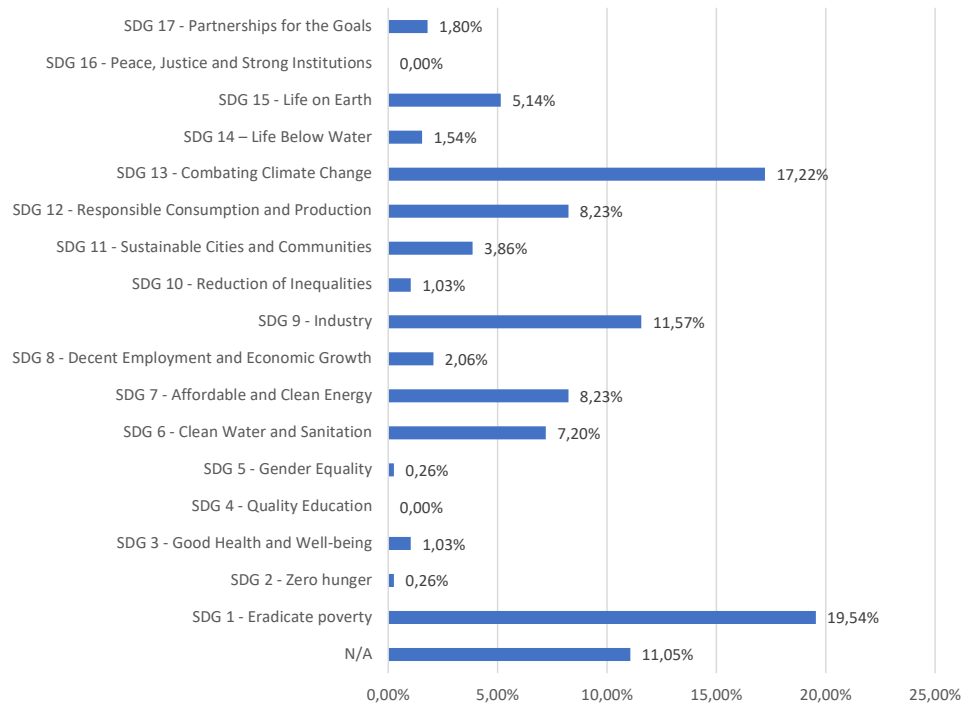
Source: Survey conducted with the business sector. MMA, 2020.

The Chart 24, implemented adaptation measures are related to a number of Sustainable Development Goals (SDGs). The most mentioned SDG was SDG 1 – Eradication of Poverty (19.54%). Next came, SDG 13 – Combating Climate Change (17.22%) and SDG 9 – Industry (11.57%). A third block, with less frequent mentions, includes SDG 12 – Responsible Consumption and Production (8.23%), SDG 7 – Accessible and Clean Energy (8.23%), and SDG 6 – Clean Water and Sanitation (7.20%). A fourth block in terms of number of mentions involves SDG 15 – Life on Earth (5.14%) and SDG 11 – Sustainable Cities and Communities (3.86%). Finally, a fifth

block with the lowest number of mentions involves SDG 8 - Decent Employment and Economic Growth (2.06%), SDG 14 – Life Underwater (1.54%), SDG 17 – Partnerships in Support of Goals (1.8%), SDG 10 – Reduction of Inequalities (1.03%), SDG 3 – Good Health and Well-Being (1.03%), SDG 2 – Zero Hunger (0.26%) and SDG 5 – Gender Equality (0.26%). Two of the 17 SDGs were not identified as being related to the adaptation measures implemented by the companies, namely: SDG 4 – Quality Education, and SDG 16 – Peace, Justice and Strong Institutions (0% of mentions each).



CHART 24 – SUSTAINABLE DEVELOPMENT GOALS (SDGS) RELATED TO ADAPTATION MEASURES IMPLEMENTED BY COMPANIES (N=389)



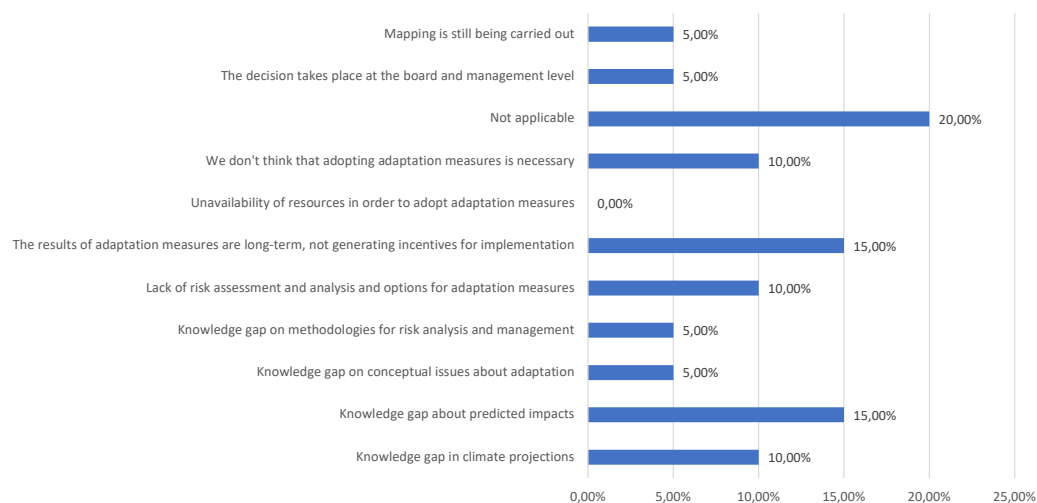
Source: Survey conducted with the business sector. MMA, 2020.

23% of the companies that took part in the survey stated they had not implemented any adaptation measures and were asked about the reasons they had not yet implemented these measures (Chart 25). The primary reasons given were: a lack of knowledge on the expected impacts and long-term results, thereby providing no incentives for implementation. Overall, the following areas were pointed out: lack of knowledge on predicted impacts (15%); results in the long term failing to

generate incentives for implementation (15%); lack of knowledge on climate projections (10%); adoption of adaptation measures considered unnecessary (10%); lack of structured processes (risk survey and analysis and options for adaptation measures) (10%); conceptual knowledge gap about adaptation (5%); lack of knowledge on methodologies for risk analysis and management (5%); early-stage mapping (5%); and decisions made at the board and management level (5%).



CHART 25 – REASONS FOR NOT DEPLOYING CLIMATE CHANGE ADAPTATION MEASURES (N=20)



Source: Survey conducted with the business sector. MMA, 2020.

As for the barriers reported by companies for taking part in this agenda, the long-term nature of adaptation measures is a challenge because it does not fit into the time frame envisaged by businesses, given that the benefits related to adaptation are felt over the medium and long term, while the cost of implementing the measures occurs in the short term. Along these lines, it was pointed out that it is important to illustrate the cost of inaction, which is greater than the cost of action in most cases. Once again, the importance of accounting for the costs of climate change impacts to business is emphasized, as discussed earlier in relation to Chart 12.

Another salient topic mentioned is the knowledge gap, be it related to predicted impacts, climate projections, concepts related to the theme of adaptation to climate change (such as resilience, vulnerability, exposure) and/or on methodologies to address the topic in-house. To this end, technical training for internal teams becomes essential. This creates an internal capacity to gather and analyze the information needed to develop adaptation plans.

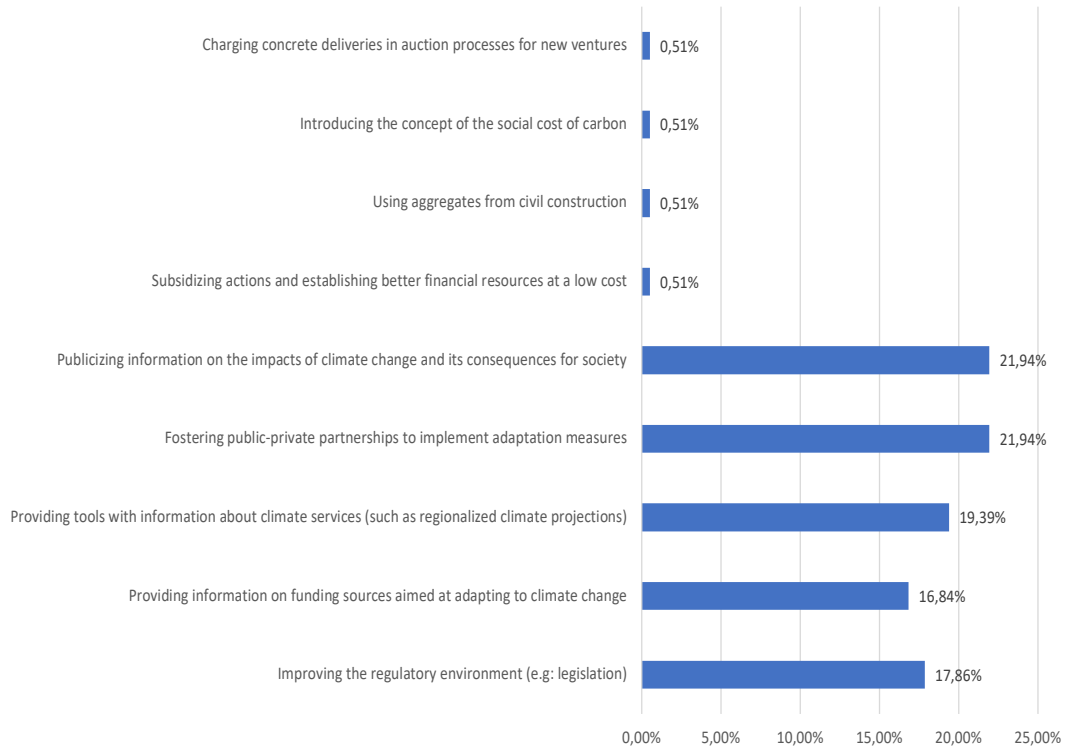
A third block of barriers that can be extracted from the answers relates to internal awareness, engagement of senior management and structuring internal processes to work on the issue of adaptation to climate change. The disconnect between scientific and business language is a common barrier when it comes to sustainability themes. It requires an effort to translate the scientific content into the

business context, meaning that internal awareness is needed on the relevance of the issue from the business point of view. As such, it is important to get core areas of the business involved and to promote further training in order to properly communicate the topic. As to the lack of internal processes to address the adaptation theme, a possible solution is to try to link adaptation projects to other projects that already exist at the company, attempting to deal with the issue of climate change as a lens on business and not as an isolated area, as mentioned in Chart 6.

Finally, companies were asked about the **ways in which the Brazilian government could help them implement effective measures to adapt to extreme weather conditions** (Chart 26). The two most requested options were publicizing information about the impacts of climate change and its consequences for society and promoting public-private partnerships to realize adaptation measures, both having 21.74% of responses. A second block that was also widely cited involves the following actions: provision of tools with information about climate services (e.g.: regionalized climate projections) (19.39%); improving the regulatory environment (such as legislation) (17.86%); and availability of information about sources of financing directed at adaptation to climate change (16.84%).



CHART 26 – WAYS IN WHICH THE COMPANIES THINK THAT THE BRAZILIAN GOVERNMENT CAN HELP IMPLEMENT EFFECTIVE MEASURES TO ADAPT TO CLIMATE CHANGE (N=196)



Source: Survey conducted with the business sector. MMA, 2020.

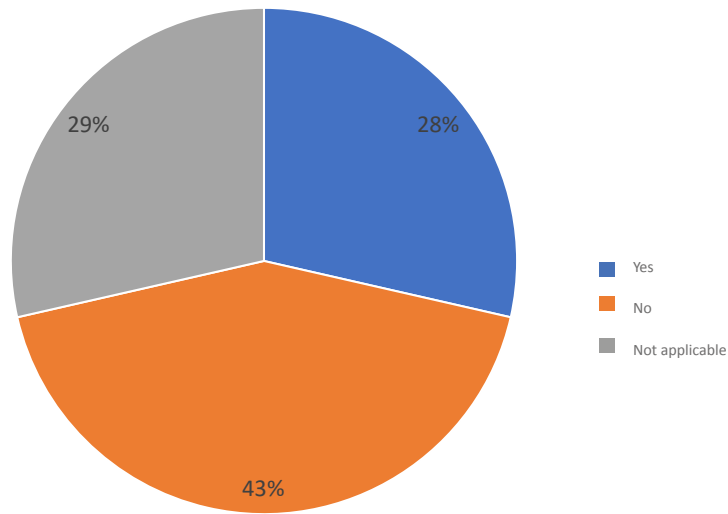
There was occasional mention of the notion of the social cost of carbon and government subsidy actions, establishing improved financial resources at low cost. Other specific actions cited by the companies were linked to the respondent's specific sector, such as charging for concrete deliveries in the auction processes for new projects and using aggregates from civil construction (representing 0.51% of responses for each action mentioned).

ASSESSMENT OF FIRST CYCLE OF THE NATIONAL ADAPTATION PLAN

The last block of questions in the survey sought to assess the First Cycle of the NAP. As can be seen in Chart 27, 43% of companies don't think that the NAP has encouraged the insertion of the climate change adaptation perspective in their agendas, while only 28% of companies believe that it has.



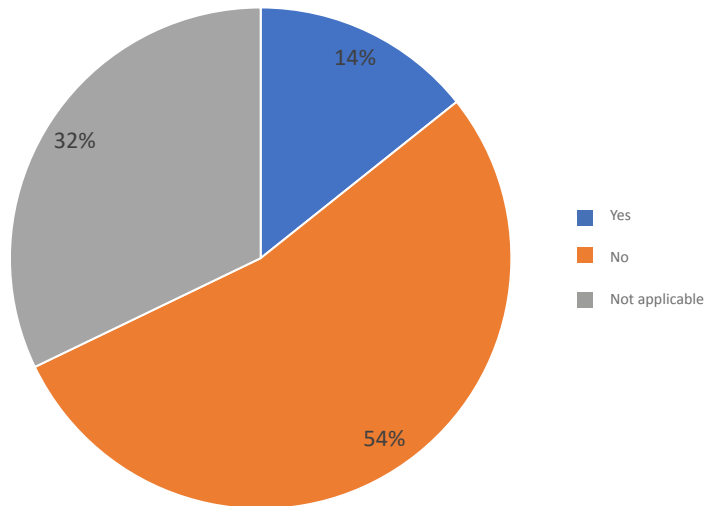
CHART 27 – COMPANIES’ PERCEPTIONS ON THE NATIONAL ADAPTATION PLAN (NAP): INCLUSION OF THE ADAPTATION PERSPECTIVE IN THE BUSINESS AGENDA



Source: Survey conducted with the business sector. MMA, 2020.

As can be seen in Chart 28, 54% of companies do not think that the NAP has stimulated the channeling of economic resources (own or raised) to the climate change adaptation agenda, while only 14% of companies believe that it has.

CHART 28 – PERCEPTIONS OF COMPANIES ON THE NATIONAL ADAPTATION PLAN (NAP): STIMULUS TO CHANNEL ECONOMIC RESOURCES TO THE ADAPTATION AGENDA

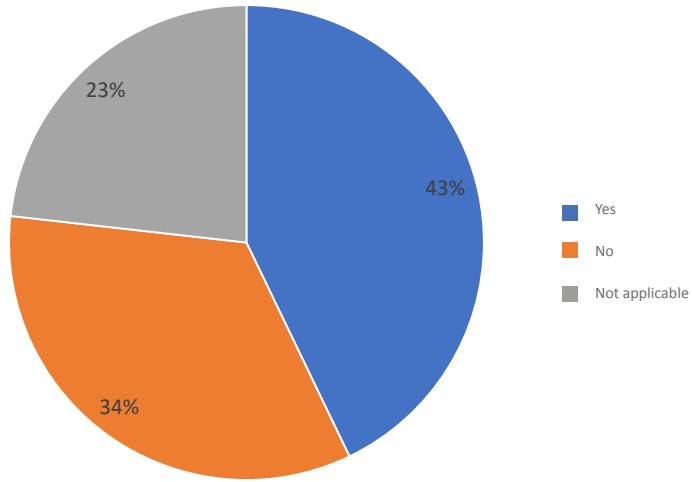


Source: Survey conducted with the business sector. MMA, 2020.

As can be seen in Chart 29, 34% of companies do not believe that the NAP has encouraged advances in understanding climate impacts and vulnerability, while 43% of companies believe that it has.



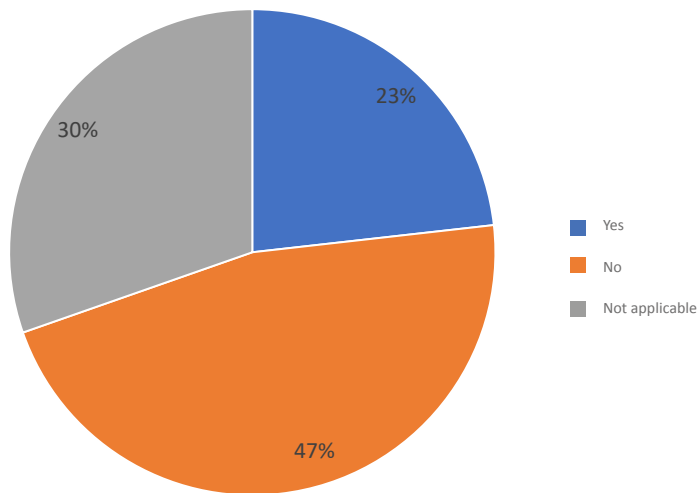
CHART 29 – PERCEPTIONS OF COMPANIES ON THE NATIONAL ADAPTATION PLAN (NAP): FOSTERING INCREASED KNOWLEDGE ON IMPACTS AND VULNERABILITIES



Source: Survey conducted with the business sector. MMA, 2020.

As can be seen in Chart 30, 47% of companies do not believe that the NAP has encouraged progress in the development of new technical capabilities for the climate change adaptation agenda, while only 23% of companies believe so.

CHART 30 – PERCEPTIONS OF COMPANIES ON THE NATIONAL ADAPTATION PLAN (NAP): ENCOURAGING PROGRESS IN DEVELOPING NEW TECHNICAL CAPACITIES

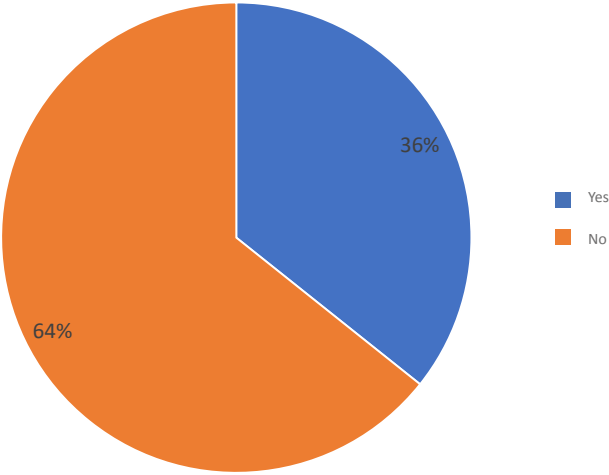


Source: Survey conducted with the business sector. MMA, 2020.

As can be seen in Chart 31, 64% of companies are not aware of the tools the federal government has made available on the subject of adaptation to climate change, while only 36% of companies are aware of such tools.



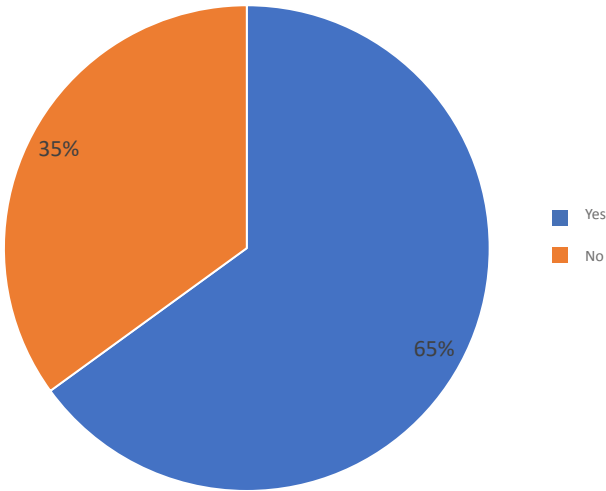
CHART 31 – COMPANIES’ FAMILIARITY WITH THE TOOLS MADE AVAILABLE BY THE FEDERAL GOVERNMENT ON THE SUBJECT OF ADAPTATION TO CLIMATE CHANGE



Source: Survey conducted with the business sector. MMA, 2020.

Among the companies that are aware of the existing tools, 65% of the companies claim to use some of them, while 35% do not use them (Chart 32).

CHART 32 – USING TOOLS MADE AVAILABLE BY THE FEDERAL GOVERNMENT ON THE SUBJECT OF ADAPTATION TO CLIMATE CHANGE ON THE PART OF COMPANIES



Source: Survey conducted with the business sector. MMA, 2020.



The tools mentioned by the companies are systematized in the Table 3.

TABLE 3 – TOOLS USED BY COMPANIES RELATED TO THE ISSUE OF ADAPTATION TO CLIMATE CHANGE

Tools used by companies	Number of mentions
Adaptaclima Platform	4
Inpe's model of climate projections for the PROJETA program	2
Tool for developing adaptation strategies by civil society organizations	1
MOVE	1
Mining Climate Vulnerability Index	1
Partnership with universities	2
IPCC, ENOS and others	1
CDP and Global Compact tools for analyzing climate change risks and opportunities	1
Control over urban erosion and biodiversity conservation	1
Diagnosis and mapping of social and environmental risks	2

Source: Survey conducted with the business sector. MMA, 2020.

On the whole, the results of companies' perceptions on the NAP reveal that there is still room to bolster dialogs and action between the government and the business sector, given that the first implementation cycle of the NAP is not recognized as responsible for fostering business initiatives on

the climate change adaptation agenda. There is also space to publicize and train companies on the use of tools made available by the federal government since 64% of the companies participating in the survey are not aware of these materials.



Finally, Board 1 below compiles the suggestions received from the companies for the next cycle of the NAP.

BOARD 1 – SUGGESTIONS BY COMPANIES FOR THE NEXT CYCLE OF THE NATIONAL ADAPTATION PLAN (NAP)

Suggestions by companies for the next NAP cycle

“First off, we appreciate the opportunity to participate in this survey and congratulate the MMA team at the forefront of this initiative. It’s important to note that the action taken by the federal government in the area of climate change is essential, given the severity of the situation that extends into the Brazilian population. Government-level suggestions for the next cycle: - widely publicize the NAP to the general public and business sector, including scientific data into the document on the severity of the impacts of deforestation actions, degradation of protected areas, GHG emissions, and others; - promote and provide information on sources of funding focused on mitigating and adapting to climate change; - foster public-private partnerships to develop and implement mitigation and adaptation measures.”

“It’s important to determine which adaptation actions need to be collective for which threats, because this way, the structuring of engagement and partnerships to identify and implement these actions will result in enhanced effectiveness in reducing climate risks. The participation of the business network and all the stakeholders involved in defining all the way up to planning will yield both economic benefits and the speed that measures are implemented.”

“Conduct discussion cycles with companies from different sectors to prepare the next cycle of the NAP. Hold discussion events on the subject with research institutions and company cases.”

“The use of aggregates in building and construction will indeed reduce impacts on permanent preservation areas and vegetation cutting in prime areas for mineral extraction.”

“Make the monitoring Working Groups (WGs) be open to public participation and allow engagement by the private sector organized by thematic sectors.”

“I think that the NAP needs to include more practical measures that actually help companies implement measures to combat climate change.”

“That actions be taken with the top regulatory agencies in the country, thereby encouraging companies to leverage their actions.”

“Publicize successful cases involving the practical implementation of adaptation measures in the business sector.”

“Suggestion - make the form available offline for an analysis and construction of responses outside the system.”

“Projections of regional scenarios and vulnerabilities.”

“Webinar and informative events held about the NAP.”

Source: Survey conducted with the business sector. MMA, 2020.

POSSIBLE CASES IDENTIFIED IN THE RESPONSES

Only 8.2% of the companies (five companies) taking part in the survey expressed their interest in non-anonymously participating with the federal government by communicating the best practices carried out by the company in terms of adaptation, those being: Braskem, Espaço Namata, Klabin S.A., Itaipu Binacional and Anglo American do Brasil.

Since the form did not have a space to provide a detailed description of possible cases, the suggestion is to contact these companies directly in order to jointly formulate a short description of the context in which the adaptation measures implemented by the company are inserted, as well as the results that have been obtained or are expected.





Based on the results obtained and the analyses performed, the following can be concluded:

Are companies aware of the climate change adaptation agenda?

The vast majority of companies taking part in the survey are familiar with the climate change adaptation agenda at an intermediate level (they are aware of climate-related risks and their impacts on business) or advanced level (they implement measures to reduce climate-related risks). This was to be expected, especially when considering that most of the companies responding to the survey are members of any of the institutions related to the Business Climate Initiatives or the Climate Network of the National Confederation of Industry, which may be regarded as an indicator for companies that have some type of contact with the topic.

What are the overall main risks and impacts of climate change for companies, now and in the future?

The top extreme events that companies noted as having impacted business over the last five years were heavy rains, followed by droughts, and floods. The primary economic impacts associated with extreme events that companies have seen include an increase in costs (operational or capital), physical damage to the facilities and disruptions in the company's operational flow. Most companies recognize that their operations may be affected by severe weather conditions in the future, and the perception of more impactful weather events remains very similar to extreme events experienced in the past and present, like heavy rains, floods and droughts.

What are the most common steps companies are taking as adaptation measures?

Among some of the actions listed by the companies, the primary adaptation measures involve: expanding the supply chain, searching for alternative sources of raw materials, searching for water autonomy and other measures to ensure water security (ex: reuse), conservation of ecosystems and biodiversity, forest restoration, diversification of the energy matrix, energy generation from alternative sources (such as solar, wind), risk analysis, development of studies (scientific and financial), innovation in product development, and developing crisis plans.

Three major blocks with the highest number of mentions could be identified related to classification of adaptation measures implemented by the companies. The first involves: (i) adopting new technologies and/or products, (ii) investing in new infrastructure, and (iii) improving existing infrastructure. The second involves: (iv) diversifying the energy matrix, and (v) developing research and development on new products and/or markets. Finally, the third involves: (vi) identifying and implementing new business opportunities, and (vii) deploying nature-based solutions (NBSs).

As for the correlation between adaptation measures implemented by companies with the sectors of the NAP, the key sectors mentioned included infrastructure, energy and water resources. A second block that also has a significant amount of mentions involves the sectors of biodiversity and industry and mining, and agriculture.

Of the three objectives of the NAP, the measures implemented are mostly related to objective 3 - rolling out adaptation and climate risk reduction actions.

The implemented adaptation measures are related to a number of Sustainable Development Goals (SDGs). The most mentioned was SDG 1 – Eradication of Poverty. Next came, SDG 13 – Combating Climate Change and SDG 9 – Industry.





How can the federal government support the climate change adaptation agenda with the business sector over the next few years?

The two priority forms of support from the federal government requested by companies were, respectively: (i) publicizing information on the impacts of climate change and its consequences to the general public, and (ii) promoting public-private partnerships in order to effect adaptation measures.

Three other actions that were also heavily mentioned by the companies were: (iii) continuing to provide tools with information on climate services (such as regionalized climate projections) (iv) improving the regulatory environment (e.g. legislation); and (v) making information available on sources of climate change adaptation finance.

How effective was the First Cycle of the National Adaptation Plan from a business point of view?

By and large, the results of companies' perceptions on the NAP reveal that there is still room to bolster dialogs and action between the government and the business sector, given that the first implementation cycle of the NAP is not recognized as responsible for fostering business initiatives on the climate change adaptation agenda. There is also space to publicize and train companies on the use of tools that the federal government will make available, given that many of the companies participating in the survey are not aware of these materials.

To what extent are the results from the survey representative of the actual business context at the national level?

81% of the companies that responded to the survey were large-scale companies. As such, the findings can be regarded as representative of the actual

circumstances of large-scale Brazilian companies (or those with activities in Brazil), given that they were the majority participating. A possible link to the size of the business is the level of maturity of the responding companies, given that almost half of the companies have extensive knowledge on the subject.

It is widely known that this scenario is not the case at the national level, with a number of companies still focused on mitigating climate change, and others that have still not addressed the issue of climate change, either because of a lack of internal awareness or due to a lack of resources (human, financial, etc.) given the size of the business. As such, despite representing the lowest percentage of responses to the survey, this business profile is taken into account when defining the next steps of the agenda at the national level, attempting to raise awareness and engage small and medium-sized enterprises in the subject of adaptation to climate change.

This, however, does not invalidate the relevance of the sample obtained by the survey. Quite the contrary, the findings are very relevant to considerations on the next steps in the climate change adaptation agenda with companies that are actively working on the agenda, leveraging actions that have been implemented. There is also the possibility of working with large-scale companies in the role of anchor companies, which have the potential to involve several other smaller companies along their value chain.

Given that adaptation to climate change involves interventions at a territorial level, which can scarcely be implemented by only one stakeholder in isolation, the findings in this survey can provide a basis to reflect the possibility of concerted efforts between the government and large-scale companies in the role of anchors, and smaller companies, with the goal of promoting resilience and reducing vulnerabilities at local levels.



What are the main suggestions by companies for the next cycle of the National Adaptation Plan?

The suggestions received by companies for consideration in the process of preparing the next cycle of the NAP involve:

- Broaden the promotion of the NAP to both the general public and to the business sector through, as an example, webinars and informational events;
- Communicate the urgency of the topic involving scientific data;
- Provide forecasts of regional scenarios and vulnerabilities;
- Make information available on funding sources;
- Encourage public-private partnerships;
- Identify which contexts joint actions are needed to implement adaptation measures, thereby building engagement and partnerships;
- Conduct rounds of discussion with companies from various sectors and with research institutions to prepare the next cycle of the NAP;
- Open the Monitoring Working Groups (TGs) to public participation;
- Publicize successful cases involving the practical implementation of adaptation measures in the business sector;
- Develop actions along with the main regulatory agencies of the country; and
- Focus more on practical measures.





On behalf of:



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for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany

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