

ACT

ADAPTATION



ACT PHYSICAL RISKS & ADAPTATION

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ACT | ASSESSING LOW CARBON TRANSITION[®]

ACKNOWLEDGMENTS

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DRAFT

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1. Introduction

The world has already exceeded +1°C global warming compared to the pre-industrial period (1850-1900). Climate change has been definitively linked with severe and widespread consequences across the globe (see the World Weather Attribution initiative). Thus, adaptation to the current and future climate system is essential and must be taken into consideration alongside mitigation efforts. All actors (private actors, companies, territories, governments etc.) have to start acting now to adapt.

Article 7 of the Paris Agreement defines the global goal of “enhancing adaptive capacity, strengthening resilience and reducing vulnerabilities to climate change”. It also requires that all Parties should engage in adaptation planning and implementation through, for example, national adaptation plans, vulnerability assessments, monitoring and evaluation, and economic diversification.

Despite the growing issue of adaptation for companies, there is a lack of standardized and operational frameworks for analysing physical risks and assessing the adaptation strategies of private actors. Existing standards provide generic guidelines and recommendations (e.g., ISO 14090 and ISO 14091). **This ACT Physical Risks and Adaptation framework aims to assess companies’ adaptation strategies, from physical risk analysis to governance and decision-making. The principles and structure of ACT Physical Risks and Adaptation are consistent with those of ACT Mitigation. These two parts of ACT are independent but can be combined to obtain a comprehensive climate strategy assessment. This ACT Adaptation framework is not a risk analysis methodology.**

This methodology has been developed based on ADEME’s expertise regarding adaptation to climate change, and bibliographical review. The latter includes publications from the World Resource Institute (WRI), the Intergovernmental Panel on Climate Change (IPCC) and the ISO standards. The Physical Climate Risks dimension also draws on publications from Carbone 4 and the Institute for Climate Economics (I4CE). The indicators and the structure of the Adaptation dimension mainly focus on reports from ADEME. Modules and indicators include recommendations from the European Taxonomy (EU Taxonomy), the European Bank for Reconstruction and Development (EBRD), Task Force on Climate-related Financial Disclosures (TCFD) and ISO 14090 standard. All references can be found in Sources (see Section 7), at the end of this document.

The ACT Adaptation assessment structure is composed of three dimensions: Governance and Decision-Making, Physical Climate Risks and Adaptation. Each dimension is composed of several modules and indicators. This structure aims at carrying out a holistic assessment of the company’s strategy, organisation and operation, along its entire value chain.

2. Principles

The application of principles is fundamental to ensure that climate impact-related information is true and fair. The principles are the basis for, and will guide the application of, requirements in the present methodology.

| |
|---|
| Relevance - Select the most relevant information to assess physical risks and adaptation. |
| Verifiability - The data required for the assessment shall be verified or verifiable. |
| Conservativeness - Whenever data are not sufficiently relevant nor verifiable, indicators shall be scored to 0. |
| Consistency - Whenever time series data is used, it should be comparable over time. |
| Long-term orientation - Enables the evaluation of the long-term physical risks and adaptation performance of a company while simultaneously providing insights and consistency into short-term and medium-term outcomes in alignment with the long-term. |

TABLE 1: PRINCIPLES FOR IMPLEMENTATION

RATIONALE: The indicators, metrics and weightings developed and selected by the methodology development team and the analyst will be evaluated against these principles.

3. Scope

3.1. SCOPE OF THE DOCUMENT

This document presents the ACT Adaptation methodology: it is the common basis for all ACT Adaptation sectoral methodologies. It includes requirements, rationales, definitions, indicators, guidance and weightings for assessment.

The example of vulnerabilities and impacts for the different activities of a company along its value chain are not exhaustive. The company may decide to focus on the most relevant ones for its activity. Any other vulnerability or impact that is relevant for the company and its specific sector can be considered and analysed.

3.2. SCOPE OF THE ACT ADAPTATION METHODOLOGY

The ACT Adaptation methodology evaluates the physical risks analysis and adaptation strategy of a company, as well as its governance and decision-making structures and processes. Although specific adaptation measures do depend on the sector or size of a company, the general framework for analysing its exposure and vulnerability to hazards can be standardised. Adaptation principles and resources have general features, no matter the size or sector of the company. Thus, this methodology applies to all sectors and can be used by companies of various sizes.

This ACT Adaptation methodology aligns with ACT mitigation methodologies regarding its structure (e.g., maturity matrices, modules, etc.), principles and weightings. However, it is independent and can be applied separately.

4. Boundaries

The boundary defines the areas of a company's activities and influence to which the methodology can be applied.

In terms of time boundaries

- Past events fall within the scope, since they can help the analyst to understand the company's track record in terms of its vulnerability to hazards and thus it may help building their adaptation capacity.
- Current weather events are also within the scope, since the world's climate is already changing and influencing the company's activity.
- However, this methodology is strongly future-orientated, as much for physical risk exposure, vulnerabilities and impact analysis as for the adaptation strategy. Anticipating future climate change through scientific scenarios and company planning is key.

The analysis and adaptation considerations must be consistent within the expected lifetime of the activity.

In terms of activities: nature and location

As illustrated in Figure1, company activities are broken down into three scopes of process and control. Scope A in Figure1 represents the direct scope of the company, that is to say, assets directly operated by the company (e.g., equipment, vehicles, buildings, etc.). Scope B and C, the stakeholders on which the company depends in term of operating or revenue, also form part of the analysis. Indeed, hazards occurring at all stages of the value chain, from network infrastructure (e.g., water, electricity) to suppliers or clients of any rank (i.e., scope B or C in Figure 1), can affect the company indirectly. Thus, the complete value chain is included within the system boundaries.

Analysis and adaptation considerations must be consistent with the specificities and location of the facilities.

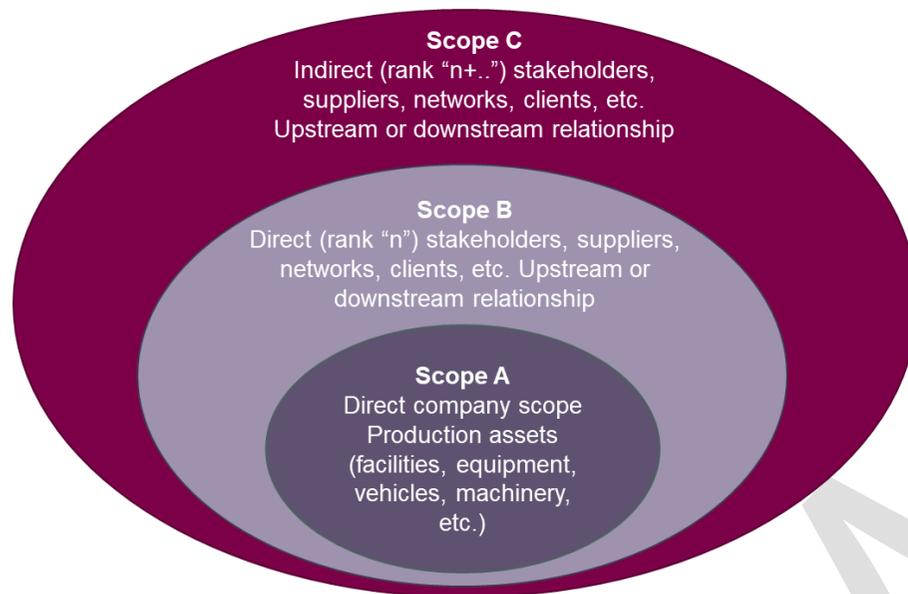


FIGURE 1: SCOPES OF THE ANALYSIS INCLUDED IN ACT ADAPTATION
 (FROM OCARA METHODOLOGY, CARBONE 4)

5. Methodology framework

5.1. GENERAL

This chapter details the ACT Adaptation methodology, as well as the steps for applying the methodology to a company.

The ACT adaptation methodology builds on the logical framework that an organization should follow towards climate change resilience and its components: physical risk exposure analysis, adaptation capacities and resources, governance and decision making to adapt to climate change. ACT Adaptation is consistent with ISO 14090 by incorporating its core elements. However, ACT Adaptation is intended to be more operational and follows the ACT framework and design (see <https://actinitiative.org/act-methodologies/>). ACT relies on the development of indicators, which provide insights regarding the readiness of an organization to adapt to physical climate risks.

5.2. DATA SOURCES

In order to carry out a company-level assessment, many data points, whether quantitative or qualitative, need to be gathered from various sources. ACT principally relies on the voluntary provision of data by the assessed companies. The nature and format of data provided might differ from one company to another. In addition, external data sources might be consulted in order to streamline the process, to ensure fairness, and to provide additional value for verification and validation. Some of this third-party data may be replaced by reported data from companies, provided that there is a rationale for doing so.

The ACT principles for implementation (relevance, verifiability, etc.: see Table 1) drive data collection. Information on the credibility of the data used for the assessment shall eventually accompany the ACT ratings.

5.3. METHODOLOGY STRUCTURE

The ACT Adaptation methodology is composed of three dimensions: Governance and Decision-Making, Physical Climate Risks and Adaptation.

Governance refers to “the system by which an organization is directed and controlled in the interests of shareholders and other stakeholders. It involves a set of relationships between an organization’s management, its board, its shareholders, and other stakeholders. Governance provides the structure and processes through which the objectives of the organization are set, progress against performance is monitored, and results are evaluated” (TCFD, June 2017). Governance and decision-making bodies provide the strategic vision and impetus for the company to adapt to climate change. Governance is a fundamental dimension of adaptation. It is completed by two more operational dimensions: the company’s climatic risks and opportunities along the entire value chain; and the company’s resources and capacities.

Each one of the three dimensions contain several modules, such as analysis, production and organisational resource. A module is evaluated through several indicators, but each indicator is independent from the other ones. Each indicator is assessed using a maturity matrix. The maturity matrix is built on five levels of progressive maturity, from Basic to Resilient (see Table 2). However, when a simpler and less granular approach is more appropriate, fewer levels are used (e.g., only Basic, Advanced and Resilient).

| Evaluation level | Basic | Standard | Advanced | Next Practice | Resilient |
|------------------|-------|----------|----------|---------------|-----------|
| Score | 0 | 0.25 | 0.5 | 0.75 | 1 |

TABLE 2: MATURITY MATRIX SCORING

The level of maturity that the company reaches for an indicator results in the corresponding scoring between 0 and 1 (see Table 2).

The five levels of the maturity matrix are similar to the ones that are used in ACT Mitigation methodology, except for the last one, “Resilient” (instead of “Low-carbon transition aligned”), to better suit adaptation terminology. It refers to the capacity of social, economic and environmental systems to be prepared and cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation (IPCC, 2014).

5.4. INDICATORS

Table 3 lists the modules and indicators used within the ACT Adaptation methodology.

| DIMENSION | MODULE | INDICATOR | SUB-INDICATORS (IF EXISTING) | |
|---|---------------------------------|--|--------------------------------|--|
| GOVERNANCE AND DECISION-MAKING | 1. INTERNAL GOVERNANCE | 1.1 Long-term vision and corporate projects | | |
| | | 1.2 The climate head | | |
| | 2. EXTERNAL GOVERNANCE | 2.1 Territorial strategy | | |
| | | 2.2 Other stakeholders | | |
| | | 2.3 Do not Significant Harm Principle | | |
| | 3. DECISION-MAKING | 3.0 Methods, indicators and tools | | |
| | PHYSICAL CLIMATE RISKS | 4. ANALYSIS | 4.1 Data and scenarios | |
| 4.2 Stake level on the value chain | | | | |
| 5. HAZARDS, EXPOSURE, SENSITIVITY AND IMPACTS OF THE VALUE CHAIN PARTS | | 5.1 Raw materials | 5.1.1 Hazards | |
| | | | 5.1.2 Exposure and sensitivity | |
| | | | 5.1.3 Impacts | |
| | | 5.2 Production, operations, processes and infrastructure | 5.2.1 Hazards | |
| | | | 5.2.2 Exposure and sensitivity | |
| | | | 5.2.3 Impacts | |
| | | 5.3 Networks and systems (water, energy and telecommunication) | 5.3.1 Hazards | |
| | | | 5.3.2 Exposure and sensitivity | |
| | | | 5.3.3 Impacts | |
| | | 5.4 Logistics and transport | 5.4.1 Hazards | |
| | | | 5.4.2 Exposure and sensitivity | |
| | | | 5.4.3 Impacts | |
| 5.5 Demand and sales | 5.5.1 Hazards | | | |
| | 5.5.2 Exposure and sensitivity | | | |
| | 5.5.3 Impacts and opportunities | | | |

| | | |
|---|---------------------------------------|---|
| ADAPTATION CAPACITIES AND RESOURCE | 6. ORGANIZATION | 6.1 Internal and external skills in climate change adaptation |
| | | 6.2 Diversification of activities |
| | | 6.3 Company context and updates of adaptation measures |
| | 7. FINANCE | 7.1 Assessment of stranded assets |
| | | 7.2 Assessment of climate externalities |
| | | 7.3 Provision, insurance and investments for action plan |
| | 8. TECHNIQUES AND TECHNOLOGIES | 8.1 Technical support and technologies |
| | | 8.2 Information and mediation |
| | | 8.3 R&D |
| | 9. HUMAN | 9.1 Working conditions |
| | | 9.2 Team trainings |

TABLE 3: ACT ADAPTATION INDICATORS

Rationale

As a systemic challenge, adaptation to climate change is a multi-level and multi-agent subject, as well as a multi-thematic policy. Therefore, as stated in ISO 14090 and confirmed in the case studies “How to make business decisions to adapt to climate change?” by ADEME 2021, the governance and decision bodies of the company shall take commitment and responsibility on systemic grounds. This refers to the internal governance, as well as to the external governance with communities and other stakeholders.

Consistent and efficient decision-making is based on the analysis of the physical hazards to which the company is exposed and the effect these can have on the company. **Hazards** refer to the potential occurrence of a natural or human-induced physical event, trend or the physical impacts of these events/trends, that may cause loss of life, injury, or other health impact, as well as damage to and loss of property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. Thus, the term “hazard” includes processes that range from brief events, such as severe storms, to slow trends, such as temperature rise, multi-decade droughts or multi-century sea level rise (from IPCC, 2014). The chosen hazards classification for ACT Adaptation is presented in the Glossary of this document. In order to study hazards and their future evolution, an analysis of climate data and scenarios is a key step.

Risks from climate change impacts arise from the interaction between hazards (triggered by an event or trend related to climate change), vulnerability (susceptibility to harm) and exposure (people, assets or ecosystems at risk). **Exposure** is the degree to which a company's value chain (e.g., assets, operations, supply chain, customers) has the potential to be impacted by physical climate hazards due to its geographic location. These metrics should link part of a company's value chain (e.g., physical assets) with specific physical climate hazards (e.g., tropical cyclones) (from IPCC, 2014). **Sensitivity** is the propensity of different parts of a company's value chain to suffer negative impacts when exposed to and impacted by physical climate hazards. These metrics should assess specific characteristics of a company's value chain (e.g., water intensity) that may make that part of the value chain more or less likely to suffer negative impacts from physical climate hazards (WRI, 2021). This combination leads to physical risks, as illustrated in Appendix 1.

Physical risks may impact the complete value chain of the company and affect it in various way. An analysis of the impacts and vulnerabilities along the different parts of the value chain is important to understand where and how to adapt. The physical risk module and its indicators cover all these aspects of risk.

The third module focuses on adaptation capacities, which contribute to making the company more flexible, capable of quickly adapting to changes, and even more competitive. According to ISO 14090 (and exemplified in ADEME. (2019), *Adaptive capacity of businesses to the impacts of climate change: case studies*), four major resources permit a company to reinforce its adaptation to climate change: organizational capacity (governance, exchange and decision-making bodies), financial resources (financing available to implement actions), technological resources (technologies, techniques and new solutions) and human resources (the specific skills and working time that the company mobilizes). These elements make up the four modules of the Adaptation dimension of ACT Adaptation.

1. GOVERNANCE AND DECISION-MAKING: INTERNAL GOVERNANCE

1.1 LONG-TERM VISION AND CORPORATE PROJECTS

DESCRIPTION & REQUIREMENTS

1.1 LONG-TERM VISION AND CORPORATE PROJECTS

SHORT DESCRIPTION OF INDICATOR

This indicator measures how the long-term strategy of the company considers climate change and its impacts on activities and business. It also considers how physical risks and adaptation are formalised and integrated into corporate projects and policies (mainly by the individual with highest responsibility for climate change: the climate head) and how they are communicated within the company.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|---|--|---|---|
| <p>The company has not adopted any long-term adaptation strategy.</p> <p>Adaptation is not formalised in corporate projects and policies, nor communicated within the company.</p> | <p>The company has identified some major gaps and issues in the long-term strategy. It recognises the need to adapt to climate change, through corporate projects and policies.</p> | <p>The company has identified gaps and progress in the long-term strategy. It is starting to put in place an adaptation approach in some corporate projects and policies. (e.g., major plans of action, risk management policies, annual budgets, reviewing and guiding strategy).</p> <p>The Heads of Departments are informed and mobilised.</p> | <p>The company has established an adaptation strategy in at least the major corporate projects and policies (e.g., major plans of action, risk management policies, annual budgets, reviewing and guiding strategy). It considers climate change and its consequences.</p> <p>The company communicates its strategy to all its employees.</p> | <p>The company has established an adaptation strategy, which is regularly updated.</p> <p>All corporate projects and policies are intended to be adapted to climate change and its consequences. The company communicates its strategy to all its employees. Employees from all relevant departments have been involved in the process.</p> |

DATA REQUIREMENTS

The analyst shall refer to the company's public reporting (annual report, sustainability report, etc.) and any other relevant documents, such as internal communications, internal notes or policies regarding its corporate projects and policies to assess the company on this indicator.

HOW THE ANALYSIS WILL BE DONE

The analysis evaluates the extent to which the company is aware of climate change and its consequences, and translates it into a strategic vision. The analysis may integrate three components: a narrative evaluation; the number of corporate projects and policies that are climate-adapted ; the degree of internal communication.

RATIONALE OF THE INDICATOR

The governance and decision-making bodies within the company enable and are the main drivers of its adaptation. Indeed, climate change impacts directly or indirectly all aspects of the company and its activities. Only the company's governance can support and drive systemic change by providing a long-term strategy and corporate projects that are consistent and adapted to future climate impacts.

1.2 THE CLIMATE HEAD

DESCRIPTION & REQUIREMENTS

1.2 THE CLIMATE HEAD

SHORT DESCRIPTION OF INDICATOR

This indicator assesses how decision-making is organised within the company, and whether this is consistent with the company's long-term vision. The climate head manages and supervises, among others, actions described in the indicator 1.1.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|---|--|--|---|
| <p>No one is in charge or supervising climate change issues.</p> <p>Departments are not involved in risk decisions or operational measures.</p> <p>There is no aggregation of processes.</p> | <p>The adaptation measures and the long-term vision are mostly managed or supervised by the individual/committee with highest responsibility for climate change that is the manager/officer.</p> <p>Departments are not involved in the risks decisions or operational measures.</p> <p>There is no aggregation of processes.</p> | <p>The adaptation measures and the long-term vision are mostly managed or supervised by the individual/committee with highest responsibility for climate change that is Senior manager/officer.</p> <p>Some relevant departments are involved in the risks decisions or operational measures.</p> <p>There is no significant aggregation of processes.</p> | <p>The adaptation measures and the long-term vision are mostly managed or supervised by the individual/committee with highest responsibility for climate change that is Senior manager/officer closely related to the decision-making structure within the company.</p> <p>Some relevant departments are involved in the risks decisions or operational measures.</p> <p>There is no significant aggregation of processes.</p> | <p>The adaptation measures and the long-term vision are mostly managed or supervised by the individual/committee with highest responsibility for climate change that is the Board or individual/sub-set of the board or other committee appointed by the board.</p> <p>All relevant departments are involved in the risks decisions or operational measures.</p> <p>There is a systemic vision thanks to an aggregation of processes.</p> |

DATA REQUIREMENTS

The company shall communicate, as a justification, any document that describes the position and the missions of the persons in charge of the physical risks and adaptation such as: the job title, the job description, contract or resume.

**HOW THE ANALYSIS
WILL BE DONE**

The analyst looks at the position of the individual(s) or board in charge of the company's adaptation strategy. It should also consider whether different departments make risk decisions or take operational measures for which they are responsible. The analyst also evaluates whether there is an aggregation of processes within a team at a transverse level.

**RATIONALE OF THE
INDICATOR**

Among other aspects, the business model of the company should be profitable and integrate physical climate risks and a climate adaptation strategy. The higher the position of the climate head within the organisation, the better physical risks and adaptation are expected to be integrated in the company strategy, ensuring that actions are implemented, supervised and monitored. This information is requested in various standards and guidance (ISO, TCFD, etc.).

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2. GOVERNANCE AND DECISION-MAKING: EXTERNAL GOVERNANCE

2.1 TERRITORIAL STRATEGY

DESCRIPTION & REQUIREMENTS

2.1 TERRITORIAL STRATEGY

SHORT DESCRIPTION OF INDICATOR

This indicator evaluates how the company's governance is aligned with local and national adaptation efforts and strategies. The company's corporate strategy should be at least consistent with that of its local and national government, since consultation and coordination with relevant actors can guarantee mutual adaptation benefits.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|----------|--|---------------|--|
| The company has not engaged in any consultation or coordination with local or national government to align its strategy. | | <p>Consultation and coordination is in process with relevant local or national government actors to identify assess and manage climate-related physical risks, as well as local adaptation.</p> <p>Adaptation efforts of other local or national government actors and regional/national adaptation plans are studied.</p> | | <p>The company checks that its adaptation actions do not significantly threaten the adaptation efforts of other local or national government actors.</p> <p>The company's adaptation measures are consistent with regional and national adaptation efforts and plans.</p> <p>The company engages with relevant local or national government actors to identify, assess and manage climate-related physical risks, as well as local adaptation.</p> |

DATA REQUIREMENTS

The company should provide any relevant document, company reporting and compliance with related recommendations. The company shall show its compliance by referring to various national or local adaptation plans (e.g., local urban plan, natural hazard prevention plans, etc.).

In cases where such local adaptation plans or natural risk prevention plans do not exist in the locations where the company's operations occur, the company shall explain how it engages with local authorities regarding adaptation and natural risk management.

HOW THE ANALYSIS WILL BE DONE

The adaptation strategy detailed by the company should not threaten or have negative consequences for the adaptation of other territorial actors. It should be consistent and aligned with territorial plans and efforts, avoiding any maladaptation or negative externalities. Engagements and discussions with relevant local and national actors help companies identify, assess and manage climate-related physical risks and adaptation, without maladaptations.

For instance, in the case of a water-intensive consumer company, a major issue would be coordination on water resource at basin scale.

RATIONALE OF THE INDICATOR

Depending on local context, territories might have their own adaptation strategy that is specific to the context and needs of that location. Companies located in these territories must have an adaptation strategy that is consistent or more ambitious than other companies' adaptation efforts, as well as with regional and national adaptation plans. The company should engage with relevant local and national actors to create consistency and dialogue.

2.2 OTHER STAKEHOLDERS

DESCRIPTION & REQUIREMENTS

2.2 OTHER STAKEHOLDERS

SHORT DESCRIPTION OF INDICATOR

This indicator focuses on how the governance of the company is aligned and coordinated with other relevant stakeholders. It includes having a corporate adaptation strategy that is consistent with other industry players' adaptation strategies. The company should engage with them as much as possible in their process towards adaptation.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|----------|---|---------------|---|
| The company has not engaged in any discussion or engagements with relevant stakeholders. | | Exchanges and engagements are in process with relevant stakeholders (suppliers, local stakeholders, distributors, key customers, shareholders, etc.) to identify, assess and manage climate-related physical risks, as well as involving them in physical risk analysis and adaptation processes. | | Engagements with relevant stakeholders (suppliers, local stakeholders, distributors, key customers, shareholders, etc.) to identify, assess and manage climate-related physical risks, as well as involving them in physical risk analysis and adaptation processes. The company's adaptation measures are consistent or more ambitious than sectoral efforts and plans. |

DATA REQUIREMENTS The company shall provide internal documents and its adaptation strategy to demonstrate how relevant stakeholders were integrated in the process. The company shall show its alignment by referring to sectoral efforts and plans.

HOW THE ANALYSIS WILL BE DONE The company should engage and discuss with any relevant stakeholder in order to identify, assess and manage climate-related physical risks to adapt, in a coordinated manner. If existing, the company's adaptation efforts and plans have to be consistent with sectoral ones.

RATIONALE OF THE INDICATOR The company's process for analysing physical risks and defining an adaptation strategy should involve other actors and stakeholders in order to ensure overall consistency with relevant stakeholders' adaptation plans and efforts, as well as with sectoral ones if existing. This enables the company to identify, assess and manage climate-related risks that can impact several stakeholders and be better tackled through coordinated action.

2.3 DO NOT SIGNIFICANT HARM PRINCIPLE

DESCRIPTION & REQUIREMENTS **2.3 DO NOT SIGNIFICANT HARM PRINCIPLE**

SHORT DESCRIPTION OF INDICATOR This indicator evaluates the extent the company's adaptation actions do not significantly harm, or even have a positive impact, on climate change mitigation, biodiversity, health, pollution, resource depletion, etc.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|----------|---|---|---|
| The company does not take into account other environmental issues and how its strategy interacts with them. | | The company has an adaptation strategy that partly takes into account other environmental issues (impact on climate mitigation, biodiversity, health, pollution, etc.). | The company has an adaptation strategy in place that takes into account other environmental issues (impact on climate mitigation, biodiversity, health, pollution, etc.). | It checks that the adaptation actions do not significantly harm, or even have a positive impact on climate change mitigation, biodiversity, health, pollution, resource depletion, etc. |

DATA REQUIREMENTS

The company shall provide its compliance with the EU Taxonomy DNSH criterion, as well as any relevant documents or company reporting.

HOW THE ANALYSIS WILL BE DONE

The analyst can refer to the negative and positive externalities analysed in indicator 7.2, as well as the environmental assessment of technologies in indicator 8.1, and decision-making (indicator 3.0).

The company should favour, when possible, nature-based solutions for adaptation and should specify which one have been used. According to the International Union for Conservation of Nature (IUCN), Nature-Based Solutions “are actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.”

RATIONALE OF THE INDICATOR

It is essential that the adaptation strategy of a company avoids maladaptation practices. According to the IPCC, maladaptation corresponds to “any changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead”. These criteria are present in various recommendations, including the EU Taxonomy, which makes explicit that adaptation actions and measures taken by the company should not harm in any way, or even have a positive impact on climate change mitigation, biodiversity, health, pollution, etc.

3. GOVERNANCE AND DECISION-MAKING: DECISION-MAKING

3.0 METHODS, INDICATORS AND TOOLS

DESCRIPTION & REQUIREMENTS

3.0 METHODS, INDICATORS AND TOOLS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to assess how the company makes business decisions through methods and indicators. This indicator bridges the physical risk analysis, adaptation capacities, and Governance and Decision-Making module.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|---|---|--|---|
| The company has not engaged in setting up any methods, indicator and tools. | The need for methods and indicators for decision-making related to physical risks, adaptation, opportunities and strategic retreat (e.g., due to coastal floods) have been recognised and formalized. | The company is investigating which methods, indicators and tools are best suited to its size and business to enable decision-making with regard to analysis of physical risks, adaptation, opportunities and strategic retreat (e.g., due to coastal floods). | The company is putting in place the methods, indicators and tools enabling decision-making with regard to analysis of physical risks, adaptation, opportunities and strategic retreat (e.g., due to coastal floods). | The company has set up methods, indicators and tools enabling decision-making with regard to the analysis of physical risks, adaptation, opportunities and strategic retreat (e.g., due to coastal floods). The methods, indicators and tools are operational, regularly updated and have already produced results. The method is recognised as robust and flexible. It seeks to avoid maladaptation. It is suitable to the company size and business. |

DATA REQUIREMENTS

If the company uses the Flexible Adaptation Pathways method, it should disclose it, with reference to long-term objectives, decision points and thresholds and monitoring system. Otherwise, the company should provide the methods, indicators and information system it has developed to integrate physical climate risks and adaptation capacities into its governance and decision-making processes.

**HOW THE ANALYSIS
WILL BE DONE**

The Flexible Adaptation Pathways method can help the company to set up and improve methods, indicators and tools. This method combines immediate actions with more ambitious ones to be implemented when the former is no longer sufficient. A long-term objective is defined, as well as a list of adaptation actions of different types and scope. The company shall determine thresholds or decisions points beyond which it will be appropriate to activate the next action of the trajectory (ADEME, 2021). Other methods exist (in particular robust decision-making and scenario planning) and can be used for this indicator.

The analyst shall refer to the climate risk analysis (indicators 5.1 to 5.5), internal procedures, projects and partnerships. It shall also evaluate potential maladaptation.

In particular, water and biomass resources are particularly exposed to climate change, and tend to be critical resources. They require risk analysis, adaptation capacity and (for water resources) coordination at basin scale. If applicable, decision-making should have a specific focus on these resources.

**RATIONALE OF THE
INDICATOR**

Most economic sectors will face important challenges in the coming years, due to climate change effects combined with ecological transition. It is crucial that companies improve their decision-making and adaptation action plans. This indicator reflects how the systemic concept of climate change adaptation is made operational and it relies on several other indicators.

DRAFT

4. PHYSICAL CLIMATE RISKS: ANALYSIS

4.1 DATA AND SCENARIOS

DESCRIPTION & REQUIREMENTS

4.1 DATA AND SCENARIOS

SHORT DESCRIPTION OF INDICATOR

This indicator corresponds to the analysis of climate data, weather variability and scenarios to assess hazards and exposure.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|--|--|---|--|
| The company has not conducted any physical climate risk projections, scenario analysis or assessment. | <p>The company considers past and current weather events in its regular risk analysis.</p> <p>The company has explored some climate data and projections, but no specific resources are dedicated to climate data.</p> | <p>The company considers historical and current weather events and variability in its regular risk analysis.</p> <p>It draws up climatic projections based on available climate data and projections across at least one scenario.</p> | <p>The company considers historical and current weather events and variability.</p> <p>Climate data and projections are based on at least two contrasted scenarios, consistent with the lifespans of the company's activities and infrastructure.</p> | <p>The company has built up a consistent set of climatic data from reliable data sources.</p> <p>It establishes state-of-the-art projections across a range of future scenarios.</p> |

DATA REQUIREMENTS

The company shall provide its complete physical risk and resilience analysis or at least a summary of the main elements found, especially the data, projections and scenarios used.

HOW THE ANALYSIS WILL BE DONE

The analysis focuses on :

- The time scale : historical time series, current climate, mid-term and long-term projections
- The quality of data: sources, length of time series, consistency
- The use of different scenarios. The Representative Concentration Pathways (RCP) or the Shared Socioeconomic Pathways (SSP) are the most common and preferred. Two scenarios should be preferentially considered: a scenario that limits global warming to +2°C compared to the pre-industrial period and a worst-case scenario for physical risk analysis to better account for exposure and vulnerability. However, any other relevant climate scenarios, projections and data (e.g., mean, extremes and variability) can be used for this indicator, as long as sources and justifications are present, and that the number of scenarios analysed is respected.

The analysis may indicate whether the company has internal expertise of climate data analysis, or whether this is externally employed.

RATIONALE OF THE INDICATOR

Analysis of past weather events can help the company to understand how it has been affected in the past, and thus how it could be affected in the future. However, climate projections and scenarios implies an important level of uncertainty. Thus, taking into account this uncertainty is essential.

A scenario that limits global warming to well below +2°C compared to the pre-industrial period is taken as a reference point since it is aligned with the Paris Agreement goal and the level of ambition of ACT Mitigation methodologies. A worst-case scenario should also be considered since it allows the company to better take into account physical risks that could dramatically affect the company.

Analyzing physical risks and adaptation thanks to various scenarios allows the company to take into account various uncertainties, and helps the company to adapt adequately and proportionally to climate impacts. Many standards (ISO, TCFD, EBRD, IPCC, etc.) recommend the analysis of projections and scenarios to analysis physical climate risks.

4.2 STAKE LEVEL ON THE VALUE CHAIN**DESCRIPTION & REQUIREMENTS****4.2 STAKE LEVEL ON THE VALUE CHAIN****SHORT DESCRIPTION OF INDICATOR**

This indicator assesses the company's ability to analyse the consequences of climate change on the value chain. Here the evaluation relies on the three scopes introduced in Figure1. A high score on this indicator means that the company has a

comprehensive understanding of the climate dependency all along the value chain, and is able to prioritise the impacts studied in indicators 5.1 to 5.5.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|----------|---|---------------|---|
| The company has not conducted any analysis regarding the climate dependency of its value chain. | | The company has identified the activities in scopes A and B of the value chain (see Figure1) that are essential and most climate-dependant. These activities cannot be affected by physical risks without critically impacting the company. | | The company has identified the activities in scopes A, B and C of the value chain (see Figure 1) that are essential and most climate-dependant. These activities cannot be affected by physical risks without critically impacting the company. |

DATA REQUIREMENTS

The company can rely on any methodology to determine the stake level on the value chain, as long as it specifies the methodology used. For instance, a dynamic mapping of the key processes and value chain is a simple model to work with. Other data include: the minimum level of activity accepted, the maximum interruption time allowable, potential redundancy, supplier evolution, or how much a given segment of the value chain contributes to this company activity.

HOW THE ANALYSIS WILL BE DONE

The analysis checks the consistency of value chain mapping. Redundancy and diversity are means to alleviate a strong dependency on resource or suppliers and should be positively valued. The analyst should also examine, as far as possible, changes in the value chain: changes in product specifications, suppliers, transport infrastructure, etc.

RATIONALE OF THE INDICATOR

Considering the complete value chain to analyse the hazards that could affect it is essential to tackling all the possible negative effects and cascading impacts on the company. However, to do an in-depth and precise analysis, it is better to focus on the activities and the parts of the value chain that are either essential to the company or the ones that will critically impact the company's functioning if affected.

5. PHYSICAL CLIMATE RISKS: HAZARDS, EXPOSURE, SENSITIVITY AND VALUE CHAIN IMPACTS

5.0 GENERAL

Physical climate risks arise from the interaction between hazards (triggered by an event or trend related to climate change), sensitivity (susceptibility to harm) and exposure (people, assets or ecosystems at risk). The cross-assessment of each element leads to the characterization of physical risks: see Appendix 1. The related definitions and terms used in the following can be found in the glossary of this document (section 8).

5.1 RAW MATERIALS

DESCRIPTION & REQUIREMENTS

5.1.1 RAW MATERIALS: HAZARDS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to reflect how the company has screened the climate hazards that could interact with direct or indirect raw material supply (including time frame and geographical considerations).

| Basic | Standard | Advanced | Next practice | Resilient |
|---|---|--|--|---|
| The company has not considered any hazards and how these could affect its activities through its raw materials. | The company has explored and identified the climate dependencies of raw materials processed by the company. | The company has qualitatively assessed the climate dependencies of raw materials processed by the company, based on the likelihood, magnitude and duration of hazards. | The company has qualitatively assessed the climate dependencies of raw materials with regard to their lifetime and geographical location. A list of hazards has been set up. The qualitative assessment takes into account the major hazard parameters: likelihood, magnitude and duration, variability, etc. | The company has quantitatively assessed the climate dependencies of raw materials, with regard to their lifetime and geographic location. The quantitative assessment takes into account the major hazard parameters: likelihood, magnitude, duration, variability, etc. |

DATA REQUIREMENTS

The company shall provide its physical risk analysis, especially regarding its hazards. Any information, sources and justification about how the company is conducting its hazards analysis can be used. Thus, the company shall mention which hazards are considered for this part of the value chain.

HOW THE ANALYSIS WILL BE DONE

The analysis should check which hazards have been considered and their link with raw material supply. The analysis should evaluate the degree of comprehensiveness: the highest score would mean that hazards, statistical occurrence, climatic projections, value chain, geographic and temporal features are thoroughly covered.

RATIONALE OF THE INDICATOR

Raw materials are crucial, especially in the primary and secondary sectors of the economy. Climate hazards leading to potential disruptions in raw material supply (indicator 5.1.3) should be carefully examined, especially regarding the duration and the location.

DESCRIPTION & REQUIREMENTS**5.1.2 RAW MATERIALS: EXPOSURE AND SENSITIVITY**

SHORT DESCRIPTION OF INDICATOR

This indicator aims to evaluate the extent to which the raw materials that are processed by the company are exposed and sensitive to climate hazards. For example, if raw material suppliers are all located in the same area, their availability may be sensitive to climate hazards affecting that area, such as floods.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|--|---|---|--|
| The company has not conducted any in-depth physical climate risk analysis or assessment regarding its exposure and sensitivity. | The company is aware of the notions of exposure and sensitivity. | The company has started to evaluate the exposure and sensitivity of some of its raw materials, for the most important hazards identified. | The company has evaluated the exposure and sensitivity of its raw materials throughout the value chain for the most important hazards identified. | The company has evaluated the exposure and sensitivity of its raw materials throughout the value chain, for the most important hazards identified (Scope A, B and C in Figure 1). The assessment is based on a quantitative approach (for instance: criticality score, thresholds). |

DATA REQUIREMENTS

The company shall provide its physical risk analysis, especially concerning its exposure and sensitivity to climate change. Any information, sources and justification about how the company is conducting its exposure and sensitivity analysis can be used, as well as the facilities considered.

HOW THE ANALYSIS WILL BE DONE

The company should mention which part of the value chain is considered. If only a certain part is considered, rank 1 raw material suppliers (scope B in Figure1) are the priority. If the complete value chain is considered (scope A, B and C in Figure 1), the exposure and sensitivity of raw material suppliers from all ranks are analysed.

RATIONALE OF THE INDICATOR

Analysing the exposure and sensitivity of a company’s facilities along the value chain is a key step to analysing the potential climate impacts from which it can suffer before adapting. Because of cascading effects of hazards on the company’s activities, it is important to consider all raw material suppliers, from all ranks.

DESCRIPTION & REQUIREMENTS

5.1.3 RAW MATERIALS: IMPACTS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to assess the potential climate risks and impacts related to raw materials. These impacts can be, for example:

- disruptions
- shortages
- increased costs of supplies due to scarcity
- changes in input and resource prices

| Basic | Standard | Advanced | Next practice | Resilient |
|---|--|--|---|---|
| Impacts on raw materials are not considered. The company remains passive in the face of climate risks to raw materials. | The most relevant impacts due to the major hazards on the raw materials are qualitatively evaluated. | The most relevant impacts due to the major hazards on the raw materials are analysed. These impacts are expressed in terms of company performance and value. | The most relevant impacts due to the major hazards on the raw materials are considered, analysed and quantified: likelihood, percentage of loss, and duration. These impacts are expressed in terms of company performance and value. | The most relevant impacts due to the major hazards on the raw materials are considered, analysed, quantified and regularly updated. The whole value chain is considered. These impacts are expressed in terms of company performance and value: likelihood, percentage of loss, and duration. |

DATA REQUIREMENTS

The company shall provide its impact analysis.

HOW THE ANALYSIS WILL BE DONE

The most relevant impacts on the company's raw materials should be considered, analysed, quantified and monitored for this indicator. Any impact not mentioned previously can be added and analysed if considered appropriate and necessary. The impacts on the company's performance and its value should be analysed.

For example, biomass resources are particularly exposed to climate change, and tend to be critical resources. They require risk analysis.

RATIONALE OF THE INDICATOR

Raw materials are crucial especially in the primary and secondary sectors of the economy. An impact indicator is the most significant on business purpose.

5.2 PRODUCTION, OPERATIONS, PROCESSES AND INFRASTRUCTURE

DESCRIPTION & REQUIREMENTS

5.2.1 PRODUCTION, OPERATIONS, PROCESSES AND INFRASTRUCTURE: HAZARDS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to reflect how the company has screened the climate hazards that could interact with the production, operations, processes and infrastructure of the company, considering time frame and geographical position.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|--|--|---|--|
| The company has not considered any hazards and how these could affect its activities through its production, operations, processes and infrastructure. | The company has explored and identified the climate dependencies of the production, operations, processes and infrastructure processed by the company. | The company has qualitatively assessed the climate dependencies of the production, operations, processes and infrastructure processed by the company based on the likelihood, magnitude and duration of hazards. | The company has qualitatively assessed the climate dependencies of the production, operations, processes and infrastructure, with regard to their lifetime and geographical location. A list of hazards has been set up. The qualitative assessment takes into account the major hazard parameters: likelihood, magnitude and duration, variability etc. | The company has quantitatively assessed the climate dependencies of the production, operations, processes and infrastructure, with regard to their lifetime and geographic location. The quantitative assessment takes into account the major hazard parameters: likelihood, magnitude, duration, variability, etc. |

DATA REQUIREMENTS The company shall provide its physical risk analysis, especially regarding its hazards. Any information, sources and justification about how the company is conducting its hazards analysis can be used. Thus, the company shall mention which hazards are considered for this part of the value chain.

HOW THE ANALYSIS WILL BE DONE The analysis of how hazards affect the company’s activity should be done at least for the most important hazards. The hazards that most affect the company’s production, operations, processes and infrastructure shall be assessed. The company can specify whether the hazards analysis is consistent with the specific location of facilities, as well as if the hazards are assessed based on their likelihood, magnitude and duration.

RATIONALE OF THE INDICATOR This first level of climate risk analysis focuses on the core business of the company. It is closely related to its facilities’ location.

DESCRIPTION & REQUIREMENTS **5.2.2 PRODUCTION, OPERATIONS, PROCESSES AND INFRASTRUCTURE: EXPOSURE AND SENSITIVITY**

SHORT DESCRIPTION OF INDICATOR This indicator aims to study the exposure and sensitivity of the production, operations, processes and infrastructure of the company. For example, some process can be particularly sensitive to weather variations.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|--|---|---|---|
| The company has not conducted any in-depth physical climate risk analysis or assessment regarding its exposure and sensitivity. | The company is aware of the notions of exposure and sensitivity. | The company has started to evaluate the exposure and sensitivity of part of its core business, for the most important hazards identified. | The company has evaluated the exposure and sensitivity of its production, operations, core processes and infrastructure, for the most important hazards identified. | <p>The company has evaluated the exposure and sensitivity of its production, operations, core processes and infrastructure, for the most important hazards identified.</p> <p>The assessment is based on a quantitative approach (for instance: criticality score, thresholds).</p> |

DATA REQUIREMENTS The company shall provide its physical risk analysis, concerning the exposure and sensitivity. Any information, sources and justification about how the company is conducting its exposure and sensitivity analysis can be used, as well as the facilities considered.

HOW THE ANALYSIS WILL BE DONE The company should mention the extent to which the production, operations and infrastructure are considered. If only a certain part is considered, rank 1 operations and infrastructure are on the scope of analysis. If the complete value chain is considered, the exposure and sensitivity of all operations and infrastructure are analysed. The company shall analyse the exposure and sensitivity for the most important hazards.

RATIONALE OF THE INDICATOR The indicator focuses on the core business of the company (scope A in Figure 1). Because of cascading effects of hazards on the company's activity, it is important to consider all operations, processes, operations and infrastructure.

DESCRIPTION & REQUIREMENTS

5.2.3 PRODUCTION, OPERATIONS, PROCESSES AND INFRASTRUCTURE INDICATOR: IMPACTS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to assess the potential climate risks and impacts related to the company's production, operations, core processes and infrastructure. These impacts can be for example:

- Need to thermally regulate (cool or heat) both the processes and workplaces
- Disruptions or reduced productivity of operations or production capacity due to impacts on fixed capital, labour force (stress on human health and productivity) or natural resources
- Permanent loss
- Relocation costs
- Reduced workforce intensity of production
- Physical damage to assets: production facilities, infrastructure, stocks & equipment

| Basic | Standard | Advanced | Next practice | Resilient |
|---|---|---|--|---|
| Impacts on the production, operations, core processes and infrastructure are not considered. The company remains passive in face of climate risks to its core business. | The most relevant impacts due to the major hazards are qualitatively evaluated. | The most relevant impacts due to the major impacts are analysed. These impacts are expressed in terms of the company's performance and value, and working conditions. | The most relevant impacts due to the major hazards on core business are considered, analysed and quantified: likelihood, percentage of damage, duration, etc. These impacts are expressed in terms of the company's performance, value and working conditions. | The most relevant impacts are considered, analysed, quantified and regularly updated for the most important hazards identified, including impacts on the company's workers, performance and its value, depending on the location of facilities. |

DATA REQUIREMENTS

The company shall provide its impact analysis.

HOW THE ANALYSIS WILL BE DONE

The most relevant impacts on the company's production, operations, processes and infrastructure should be considered, analysed, quantified and monitored for this indicator. Any impact not mentioned previously can be added and analysed if considered appropriate and necessary.

Because of cascading effects of hazards on the company's activity, it is important to consider all operations, processes, operations and infrastructure. Therefore, this indicator is highly significant to business purpose.

RATIONALE OF THE INDICATOR

Impacts on production, operations, core processes and infrastructure may jeopardise the company itself.

5.3 NETWORKS AND SYSTEMS (WATER, ENERGY AND TELECOMMUNICATION)

DESCRIPTION & REQUIREMENTS

5.3.1 NETWORKS AND SYSTEMS (WATER, ENERGY AND TELECOMMUNICATION): HAZARDS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to reflect how the company has screened the climate hazards that could interact with the networks and systems of the company (systems of engineered components that provide water, energy or telecommunication), considering time frame and geographical position.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|--|---|---|---|
| The company has not considered any hazards and how these could affect its activities through its networks and systems. | The company has explored and identified the climate dependencies of networks and systems processed | The company has qualitatively assessed the climate dependencies of networks and systems processed by the company, based on the likelihood, magnitude and duration of hazards. | <p>The company has qualitatively assessed the climate dependencies of networks and systems with regard to their lifetime and geographical location. A list of hazards has been set up.</p> <p>The qualitative assessment takes into account the major hazard parameters: likelihood, magnitude and duration, variability etc.</p> | <p>The company has quantitatively assessed the climate dependencies of networks and systems, with regard to their lifetime and geographic location.</p> <p>The quantitative assessment takes into account the major hazard parameters: likelihood, magnitude, duration, variability, etc.</p> |

DATA REQUIREMENTS

The company shall provide its physical risk analysis, especially regarding its hazards. Any information, sources and justification about how the company is conducting its hazards analysis can be used. Thus, the company shall mention which hazards are considered for this part of the value chain.

HOW THE ANALYSIS WILL BE DONE

The analysis should check which hazards have been considered, and their link with networks and systems.

Meshed grid can be difficult to analyse. In this case, the network operator (electricity, gas, internet, water) may have produced a risk assessment document.

The analysis should evaluate the degree of comprehensiveness: the highest score would mean that hazards, statistical occurrence, climatic projections, value chain, geographic and temporal features are thoroughly covered.

RATIONALE OF THE INDICATOR

In networks and systems, the temporal variability is a key characteristic. For instance, depending on the activity, a one-hour disruption may be easily covered while a one-week disruption is critical. Therefore, the maturity matrix reflects a progression towards a temporal characterisation of hazards.

DESCRIPTION & REQUIREMENTS

5.3.2 NETWORKS AND SYSTEMS (WATER, ENERGY AND TELECOMMUNICATION): EXPOSURE AND SENSITIVITY

SHORT DESCRIPTION OF INDICATOR

This indicator aims to evaluate the extent to which the network and systems are exposed and sensitive to climate hazards.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|--|--|--|--|
| The company has not conducted any in-depth physical climate risk analysis or assessment regarding its exposure and sensitivity. | The company is aware of the notions of exposure and sensitivity. | The company has started to evaluate the exposure and sensitivity of some of its networks and systems, for the most important hazards identified. | Throughout the whole value chain, the company has evaluated the exposure and sensitivity of its networks and systems to the major hazards. | The company has evaluated the exposure and sensitivity of its networks and systems on the complete value chain, for the most important hazards identified (Scope A, B and C in Figure 1). The assessment is based on a quantitative approach (for instance: criticality score, thresholds). |

DATA REQUIREMENTS

The company shall provide its complete physical risk analysis, concerning exposure and sensitivity. Any information, sources and justification about how the company is conducting its exposure and sensitivity analysis can be used, as well as the facilities considered.

HOW THE ANALYSIS WILL BE DONE

The company should mention which part of the value chain of networks and systems is considered. If only a certain part is considered, rank 1 networks and systems suppliers are within the scope of analysis. If the complete value chain is considered, the exposure and sensitivity of all networks and systems suppliers from all ranks are analysed. The company shall analyse the exposure and sensitivity for the most important hazards.

RATIONALE OF THE INDICATOR

Analysing the exposure and sensitivity of networks and systems allows the company to identify the need for adaptation measures and actions. This indicator may be used to implement redundancy measures, for instance.

DESCRIPTION & REQUIREMENTS

5.3.3 NETWORKS AND SYSTEMS (WATER, ENERGY AND TELECOMMUNICATION): IMPACTS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to assess the potential climate risks and impacts related to networks and systems. These impacts can be, for example:

- Variations in energy costs and needs
- Variations in energy and water availabilities
- Internet availability and quality

| Basic | Standard | Advanced | Next practice | Resilient |
|---|---|--|---|---|
| Impacts on the networks and systems are not considered. The company remains passive in face of climate risks to the networks and systems. | The most relevant impacts due to the major hazards on the networks and systems are qualitatively evaluated. | The most relevant impacts due to the major hazards on the networks and systems are analysed. These impacts are expressed, among others, in terms of company's performance and value. | The most relevant impacts due to the major hazards on the networks and systems are considered, analysed and quantified: likelihood, percentage of loss, duration. These impacts are expressed, among others, in terms of company's performance and value. | The most relevant impacts due to the major hazards on the networks and systems are considered, analysed, quantified and regularly updated. The whole value chain is considered for sake of systemic approach. These impacts are expressed, among others, in terms of company's performance and value: likelihood, percentage of loss, duration. |

DATA REQUIREMENTS

The company shall provide its impact analysis.

HOW THE ANALYSIS WILL BE DONE

The most relevant impacts on the networks and systems of the company should be considered, analysed, quantified and monitor for this indicator. Any impact not mentioned previously can be added and analysed if considered appropriate and necessary. The impacts on the company's performance and its value should be analysed.

In particular, water resources are particularly exposed to climate change, and tend to be critical resources. They require risk analysis.

RATIONALE OF THE INDICATOR

Networks and systems are crucial to the company's activity. An impact indicator is the most significant on business purpose.

5.4 LOGISTICS AND TRANSPORT

DESCRIPTION & REQUIREMENTS

5.4.1 LOGISTICS AND TRANSPORT: HAZARDS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to reflect how the company has screened the climate hazards that could interact with logistics and transport of the company, considering time frame and geographical position.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|---|--|---|--|
| The company has not considered any hazards and how these could affect its activities through its logistics and transport. | The company has explored and identified the climate dependencies of logistics and transport processed by the company. | The company has qualitatively assessed the climate dependencies of logistics and transport processed by the company, based on the likelihood, magnitude and duration of hazards. | <p>The company has qualitatively assessed the climate dependencies of logistics and transport, with regard to their lifetime and geographical location. A list of hazards has been set up.</p> <p>The qualitative assessment takes into account the major hazard parameters: likelihood, magnitude and duration, variability etc.</p> | <p>The company has quantitatively assessed climate dependencies of logistics and transport, with regard to their lifetime and geographic location.</p> <p>The quantitative assessment takes into account the major hazard parameters: likelihood, magnitude, duration, variability, etc.</p> |

DATA REQUIREMENTS

The company shall provide its physical risk analysis, especially regarding its hazards. Any information, sources and justification about how the company is conducting its hazards analysis can be used. Thus, the company shall mention which hazards are considered for this part of the value chain.

HOW THE ANALYSIS WILL BE DONE

The analysis should check which hazards have been considered by the company, and their link with logistics and transport. The analysis should evaluate the degree of comprehensiveness: the highest score would mean that hazards, statistical occurrence, climatic projections, value chain, geographic and temporal features are thoroughly covered.

RATIONALE OF THE INDICATOR

Logistics and transport are crucial to the operation of the company, especially in the primary and secondary sectors of the economy. Climate hazards leading to potential disruptions in logistics and transport (indicator 5.4.3) should be carefully examined, especially regarding the duration and the location.

DESCRIPTION & REQUIREMENTS

5.4.2 LOGISTICS AND TRANSPORT: EXPOSURE AND SENSITIVITY

SHORT DESCRIPTION OF INDICATOR

This indicator aims to study the exposure and sensitivity for logistics and transport. For example, a company that is highly dependent on port facilities, fluvial transport and operations is more vulnerable to floods, coastal erosion or droughts.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|--|---|---|---|
| The company has not conducted any in-depth physical climate risk analysis or assessment regarding its exposure and sensitivity. | The company is aware of the notions of exposure and sensitivity. | The company has started to evaluate the exposure and sensitivity of some of its logistics and transport, for the most important hazards identified. | Throughout the whole value chain, the company has evaluated the exposure and sensitivity of its logistics and transport to the major hazards. | The company has evaluated the exposure and sensitivity of its logistics and transport on the complete value chain, for the most important hazards identified (Scope A, B and C in Figure 1). The assessment is based on a quantitative approach (for instance: criticality score, thresholds). |

DATA REQUIREMENTS

The company shall provide its physical risk analysis, concerning the exposure and sensitivity. Any information, sources and justification about how the company is conducting its exposure and sensitivity analysis can be used, as well as the facilities considered.

HOW THE ANALYSIS WILL BE DONE

The company should mention which part of the value chain of logistics and transport is considered. If only a certain part is considered, rank 1 logistics and transport are on the scope of analysis. If the complete value chain is considered, the exposure and sensitivity of all logistics and transport from all ranks are analysed. The company shall analyse the exposure and sensitivity for the most important hazards.

RATIONALE OF THE INDICATOR

Analysing the exposure and sensitivity of a company’s facilities along the value chain is a key step to analyse the potential climate impacts from which it can suffer before adapting. Because of cascading effects of hazards on the company’s activity, it is important to consider all logistics and transport, from all ranks.

DESCRIPTION & REQUIREMENTS

5.4.3 LOGISTICS AND TRANSPORT: IMPACTS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to assess the potential climate risks and impacts for this part of the value chain. These impacts can be for example:

- Damage to transportation infrastructure (road, water, fluvial and rail) transport
- Permanent loss and relocation costs
- Cost of delays due to degraded transport conditions
- Loss of revenue due to failed delivery or service disruption

| Basic | Standard | Advanced | Next practice | Resilient |
|--|--|---|--|--|
| Impacts on the networks and systems are not considered. The company remains passive in face of climate risks to logistics and transport. | The most relevant impacts due to the major hazards on logistics and transport are qualitatively evaluated. | The most relevant impacts due to the major hazards on logistics and transport are analysed. These impacts are expressed, among others, in terms of company's performance and value. | The most relevant impacts due to the major hazards on logistics and transport are considered, analysed and quantified: likelihood, percentage of loss, duration. These impacts are expressed, among others, in terms of company's performance and value. | The most relevant impacts due to the major hazards on logistics and transport are considered, analysed, quantified and regularly updated. The whole value chain is considered. These impacts are expressed, among others, in terms of company's performance and value: likelihood, percentage of loss, duration. |

DATA REQUIREMENTS

The company shall provide its physical risk analysis.

HOW THE ANALYSIS WILL BE DONE

The most relevant impacts on logistics and transport of the company should be considered, analysed, quantified and monitor for this indicator. Any impact not mentioned previously can be added and analysed if considered appropriate and necessary. The impacts on the company's performance and its value should be analysed.

RATIONALE OF THE INDICATOR

Logistics and transport are crucial to the company's activity. An impact indicator is the most significant on business purpose.

5.5 DEMAND AND SALES

DESCRIPTION & REQUIREMENTS

5.5.1 DEMAND AND SALES: HAZARDS

SHORT DESCRIPTION OF INDICATOR

This indicator aims to reflect how the company has screened the climate hazards that could interact with demand and sales of the company, considering time frame and geographical position.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|--|---|---|---|
| The company has not considered any hazards and how these could affect its activities through its demand and sales. | The company has explored and identified the climate dependencies of demand and sales processed by the company. | The company has qualitatively assessed the climate dependencies of demand and sales processed by the company, based on the likelihood, magnitude and duration of hazards. | <p>The company has qualitatively assessed the climate dependencies of demand and sales with regard to their lifetime and geographical location. A list of hazards has been set up.</p> <p>The qualitative assessment takes into account the major hazard parameters: likelihood, magnitude and duration, variability etc.</p> | <p>The company has quantitatively assessed the climate dependencies of demand and sales, with regard to their lifetime and geographic location.</p> <p>The quantitative assessment takes into account the major hazard parameters: likelihood, magnitude, duration, variability, etc.</p> |

DATA REQUIREMENTS

The company shall provide its physical risk analysis, especially regarding its hazards. Any information, sources and justification about how the company is conducting its hazards analysis can be used. Thus, the company shall mention which hazards are considered for this part of the value chain.

HOW THE ANALYSIS WILL BE DONE

The analysis should check which hazards and climate trends have been considered, and their link with market demand and sales.

RATIONALE OF THE INDICATOR

Sales may be influenced by both punctual hazards and long-term climate trends.

DESCRIPTION & REQUIREMENTS

5.5.2 DEMAND AND SALES: EXPOSURE AND SENSITIVITY

SHORT DESCRIPTION OF INDICATOR

This indicator aims to study the exposure and sensitivity of demand and sales.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|--|--|--|--|
| The company has not conducted any in-depth physical climate risk analysis or assessment regarding its exposure and sensitivity. | The company is aware of the notions of exposure and sensitivity. | The company has started to evaluate the exposure and sensitivity of some of its demand and sales, for the most important hazards identified. | Throughout the whole value chain, the company has evaluated the exposure and sensitivity of its demand and sales to the major hazards. | The company has evaluated the exposure and sensitivity of its demand and sales on the complete value chain, for the most important hazards identified (Scope A, B and C in Figure 1). The assessment is based on a quantitative approach (for instance: criticality score, thresholds). |

DATA REQUIREMENTS

The company shall provide its physical risk analysis, concerning the exposure and sensitivity. Any information, sources and justification about how the company is conducting its exposure and sensitivity analysis can be used, as well as the facilities considered.

HOW THE ANALYSIS WILL BE DONE

The company should mention which part of demand and sales is considered. If only a certain part is considered, rank 1 demand and sales are on the scope of analysis. If the complete value chain is considered, the exposure and sensitivity of all demand and sales from all ranks are analysed. The company shall analyse the exposure and sensitivity for the most important hazards.

RATIONALE OF THE INDICATOR

Analysing the exposure and sensitivity of a company's facilities along the value chain is a key step to analyse the potential climate impacts from which it can suffer before adapting. Because of cascading effects of hazards on the company's activity, it is important to consider all demand and sales, from all ranks.

DESCRIPTION & REQUIREMENTS

5.5.3 DEMAND AND SALES: IMPACTS AND OPPORTUNITIES

SHORT DESCRIPTION OF INDICATOR

The indicator aims to assess the potential climate risks and impacts on demand and sales. These impacts and vulnerabilities can be:

- Customer access to delivery
- Variation of gross revenue
- Demand for new features

This indicator also takes into account climate-related opportunities that correspond to potential positive impacts related to climate change on an organisation. These opportunities will vary depending on the region, market and industry in which an organisation operates.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|--|---|--|---|
| Neither climate-related opportunities nor the impacts and vulnerabilities on demand and sales are considered. | The most relevant impacts and vulnerabilities are considered for some hazards (e.g., weather sensitivity of price volatility, disruptions, change in demand), including impacts on the company's performance and its value, depending on the location of facilities. | The most relevant impacts and vulnerabilities are considered and analysed for some hazards (e.g., weather sensitivity of price volatility, disruptions, change in demand), including impacts on the company's performance and its value, depending on the location of facilities. Breakdown of sales by country and segment for monitoring and analysis. | The most relevant impacts and vulnerabilities are considered, analysed and quantified for the main hazards identified (e.g., weather sensitivity of price volatility, disruptions, change in demand), including impacts on the company's performance and its value, depending on the location of facilities. Identification of climate-related opportunities based on adapting to market shifts driven by a changing climate. Breakdown of sales by country and segment for monitoring and analysis. | The most relevant impacts and vulnerabilities are considered, analysed, quantified and monitored (regularly updated) for the main hazards identified (e.g., weather sensitivity of price volatility, disruptions, change in demand), including impacts on the company's performance and its value, depending on the location of facilities. Identification of climate-related opportunities based on adapting to market shifts driven by a changing climate and development. Breakdown of sales by country and segment for monitoring and analysis. |

DATA REQUIREMENTS

The company shall provide its impact analysis.

**HOW THE ANALYSIS
WILL BE DONE**

The most relevant impacts and vulnerability of demand and sales should be considered, analysed, quantified and monitor for this indicator. Any other relevant impact not mentioned previously can be added and analysed. A breakdown of sales by country and segment allows the analyst to better analyse how climate hazards could affect the company's demand.

**RATIONALE OF THE
INDICATOR**

Demand and sales are crucial to the company's activity. An impact indicator and a breakdown of sales by country and by segment allow the company to better analyse how climate hazards could affect the company's activity.

In this methodology, climate-related opportunity focuses on opportunities to adapt to market shifts driven by physical climate impacts and cater to any resulting new market needs, that is to say, the fundamental shifts in climate over the longer term may affect value chains and drive new consumer needs. For example, technology to keep buildings cool, along with water- and energy-efficient technologies, or crops that are better suited to chronic changes in precipitation and temperature (EBRD). Climate change creates risks but also opportunities that can benefit the company.

DRAFT

6. ADAPTATION CAPACITIES AND RESOURCES: ORGANIZATION

6.1 INTERNAL AND EXTERNAL SKILLS IN CLIMATE CHANGE ADAPTATION

DESCRIPTION & REQUIREMENTS

6.1 INTERNAL AND EXTERNAL SKILLS IN CLIMATE CHANGE ADAPTATION

SHORT DESCRIPTION OF INDICATOR

This indicator examines the knowledge and skills, be they internal or external, mobilised by the company on adaptation capacities. Collaborations or partnerships on climate adaptation are taken into account.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|----------|--|---|--|
| The company has not developed specific expertise on climate adaptation. | | The company has developed internal skills to conduct adaptation actions. | In addition to internal skills, the company has established partnerships to work on adaptation actions in a systematic way. | Both internal and external expertise is mobilised to routinely conduct adaptation actions. Partnerships allow the company to complement and disseminate its expertise. |

DATA REQUIREMENTS

The Human Resource Department may have established a mapping of internal competences. The Climate Head may also deliver information on external skills and adaptation maturity.

HOW THE ANALYSIS WILL BE DONE

The maturity analysis will be essentially based on interviews with the Human Resource Department and the Climate Head.

RATIONALE OF THE INDICATOR

Knowledge and expertise in adaptation measures allows the company to work on the four adaptation capacities and keep them up to date.

6.2 DIVERSIFICATION OF ACTIVITIES

DESCRIPTION & REQUIREMENTS

6.2 DIVERSIFICATION OF ACTIVITIES

SHORT DESCRIPTION OF INDICATOR

This indicator considers the diversification of activities by the company to counterbalance physical climate risks. For example, a farm can diversify the crops used or can initiate non-farming activities to secure some revenue in case of climate hazards.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|----------|--|---------------|--|
| The company has not considered any diversification of activities. | | The company has started to diversify its activities, based on a climate risk analysis and a business plan. | | The company has reinforced synergies and avoided potential antagonisms. Diversification is consistent with the climate risk analysis. The company demonstrates higher revenues or lower interannual variability. |

DATA REQUIREMENTS

The company shall declare the activities that have been diversified, based on the share of revenues, the seasonality of the various activities and their projected growth.

HOW THE ANALYSIS WILL BE DONE

The analysis may be based on the business plan and/or balance sheet, and take into account the complementarity, synergies and overlaps of the various activities.

RATIONALE OF THE INDICATOR

The diversification of activities is a basic principle of resilience.

6.3 COMPANY CONTEXT AND UPDATES OF ADAPTATION MEASURES

DESCRIPTION & REQUIREMENTS

6.3 COMPANY CONTEXT AND UPDATES OF ADAPTATION MEASURES

SHORT DESCRIPTION OF INDICATOR

This indicator evaluates whether the company's adaptation measures and strategy consider the context and specificities of its location. It also takes into consideration the regular update of adaptation measures.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|----------|--|---------------|---|
| The company's adaptation measures are not context specific, and are not regularly updated. | | The company's adaptation measures are context and location specific. | | The company's adaptation measures are context and location specific, and are regularly updated and improved, for example based on shared experiences. |

DATA REQUIREMENTS

Any relevant information and documentation can be used to justify the location-specificity of adaptation measures in terms of context and location. The company shall explain how often they are updated and how they are improved.

HOW THE ANALYSIS WILL BE DONE

The company should have adaptation measures that are specific to the context and situation of the company and its sector of activity. These measures should also be appropriate to the specific location of the company and related hazards. These measures should be regularly updated and improved. Shared experiences can be relevant for these purposes.

RATIONALE OF THE INDICATOR

As climate change will impact companies very differently depending on the location and characteristics of the system (infrastructure, transport, etc.), it is important to make sure that adaptation measures take location into account. Regular updates and improvements are essential to guarantee the effectiveness of measures over time.

7. ADAPTATION CAPACITIES AND RESOURCES: FINANCE

7.1 ASSESSMENT OF STRANDED ASSETS

DESCRIPTION & REQUIREMENTS

7.1 ASSESSMENT OF STRANDED ASSETS

SHORT DESCRIPTION OF INDICATOR

This indicator assesses how the company manages its stranded assets related to physical climate risks, and whether its future investments are compatible with increasing future climate hazards and impacts.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|----------|--|---------------|---|
| The company has not assessed its stranded assets. | | The company has started assessing its stranded assets and is developing a specific management plan. Moreover, the company has started to consider whether future investments are compatible with increasing climate hazards and impacts. | | The company has assessed its stranded assets and developed a specific management plan. Moreover, the company has considered whether future investments are compatible with increasing climate hazards and impacts. Decisions are taken accordingly and regularly revised. |

DATA REQUIREMENTS

The company shall provide any relevant reporting or documentation. Otherwise, a description of the company's assessment and the decisions taken is acceptable. The company can also provide the results of stress testing.

HOW THE ANALYSIS WILL BE DONE

The analysis does not evaluate stranded assets, but checks whether the company has carried out an analysis that is consistent with physical climate risks and governance. It also verifies whether a specific management plan has been developed.

RATIONALE OF THE INDICATOR

These financial aspects are crucial to the adaptation of the company. They can help ensure the company's financial stability and the viability of its projects with regard to increasing climate change impacts. Decisions can imply selling the asset, decommissioning it or reducing its risks for example.

7.2 ASSESSMENT OF CLIMATE EXTERNALITIES

DESCRIPTION & REQUIREMENTS

7.2 ASSESSMENT OF CLIMATE EXTERNALITIES

SHORT DESCRIPTION OF INDICATOR

This indicator examines climate externalities, both positive and negative, on other actors and on the company. A climate externality is here understood as a climate or environmental cost or benefit produced by an entity, a system or an actor that is not taken into account financially. It includes actions that increase or decrease the impacts of climate change, or variation of the activity because of climate change. For example, if a company builds a natural dam to prevent coastal flooding impacts, another company, further from the coast, may either benefit or face increased flooding as a result..

| Basic | Standard | Advanced | Next practice | Resilient |
|---|----------|---|---------------|--|
| The company has not assessed any climate externalities. | | Identification of positive and negative externalities is in progress. | | The company has identified the positive and negative externalities and updates them regularly. |

DATA REQUIREMENTS

The company should describe the externalities that have been analysed and how the analysis was carried out.

HOW THE ANALYSIS WILL BE DONE

The company should analyse and define precisely the positive and negative externalities to and from other actors. This assessment should be regularly updated. These elements can aid the assessment of the indicator 2.3 Do Not Significant Harm Principle.

RATIONALE OF THE INDICATOR

The assessment of climate externalities is an important aspect of an adaptation strategy. Climate externalities are often under-assessed, but they are essential to the company's effective adaptation. They also provide data and information to external partnerships (communities and stakeholders) in indicators 2.1 and 2.2, and inform the co-benefits in indicators 2.3.

7.3 PROVISION, INSURANCE AND INVESTMENTS FOR ACTION PLAN

DESCRIPTION & REQUIREMENTS

7.3 PROVISION, INSURANCE AND INVESTMENTS FOR ACTION PLAN

SHORT DESCRIPTION OF INDICATOR

This indicator takes into account the financial costs from climate change impacts quantified by the company. It also considers financial thresholds and planning tools defined by the company to better adapt. This indicator considers the adaptation measures taken by the company in term of insurance, provisions and solutions that can reduce the costs of production or asset losses.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|---|---|---|---|
| The company has not defined financial costs, and has not considered insurance or provision. | The company has identified financial positions that could suffer from climate change impacts. | <p>Definition of financial costs from climate impacts (e.g., value-at-risk, annual average loss projected impacts of climate change from disruptions, projected change in production, revenues, markets, OPEX, CAPEX due to climate change).</p> <p>The company has started to integrate physical climate risks into financial planning tools and define critical financial thresholds.</p> <p>The company has subscribed to an insurance contract that covers its climate-related losses; it takes provisions related to adaptation needs.</p> | <p>Definition and quantification of financial costs from climate change impacts (e.g., value-at-risk, annual average loss projected impacts of climate change from disruptions, projected change in production, revenues, markets, OPEX, CAPEX, due to climate change).</p> <p>Integration of physical climate risks into financial planning tools and definition of critical financial thresholds.</p> <p>The company has subscribed to an insurance contract that covers its climate-related losses; it takes provisions related to adaptation needs.</p> | <p>Definition and quantification of financial costs from climate change impacts regularly updated (e.g., value-at-risk, annual average loss projected impacts of climate change from disruptions, projected change in production, revenues, markets, OPEX, CAPEX, due to climate change).</p> <p>Integration of physical climate risks to financial planning tools and definition of critical financial thresholds regularly revised.</p> <p>The company has done everything it could to adapt thanks to its provisions and investments, and has subscribed to an insurance contract that covers residual climate losses.</p> |

DATA REQUIREMENTS

The corresponding data includes reports, insurance information, financial indicators and provisions. For the financial costs (e.g., value-at risk), tools and thresholds (e.g., the maximum change in production due to climate change that the company can handle), the company can rely on stress testing or adaptation methodologies such as **flexible adaptation pathways**. It combines immediate actions and more ambitious ones that should be implemented when the former is no longer sufficient. The company may also provide the list of examples of financial costs presented in the maturity matrix of this ACT Adaptation methodology.

**HOW THE ANALYSIS
WILL BE DONE**

The analysis should trace regular financials costs from climate change impacts. The long-term objectives, a list of major adaptation actions and the insurance costs and stranded asset coverage allow the company to draw up the “climate business plan”.

**RATIONALE OF THE
INDICATOR**

It is essential that the company quantify the potential costs of climate impacts on its activity, in order to properly reduce physical climate risks. Insurance, provision and adaptation measures are levers that can reduce risk. Insurance can be seen more as a short-term solution. Indeed, as climate risks increase, insurers will be less and less able to offer extended coverage and insurance premiums will probably increase. It is thus important for companies to adapt as much as possible and restrict insurance to residual climate loss.

DRAFT

8. ADAPTATION CAPACITIES AND RESOURCES: TECHNIQUES AND TECHNOLOGIES

8.1 TECHNICAL SUPPORT AND TECHNOLOGIES

DESCRIPTION & REQUIREMENTS

8.1 TECHNICAL SUPPORT AND TECHNOLOGIES

SHORT DESCRIPTION OF INDICATOR

This indicator takes into account the development of technical knowledge, as well as technical tools to support governance and decision-making. It also assesses the tools and technologies developed that can enable the adaptation of the company (e.g., humidity sensors). These can include, for example, experimental projects or the development of an online interface to enable every department of the company to report its results and indicators relevant to its Flexible Adaptation Pathways.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|--|--|--|--|
| The company has not developed any technical knowledge or tools to support adaptation governance and decision-making. | The company has started to consider potential needs for tools and technical support. | Needs for technical knowledge and tools to support governance and decision-making have been identified, and development has started. | <p>Technical knowledge and tools to support governance and decision-making have been developed.</p> <p>The company is starting to explore techniques and technologies that can enable adaptation (e.g., crop species that are more climate resilient).</p> | <p>Technical knowledge and tools to support governance and decision-making have been developed and are regularly updated.</p> <p>The company has developed techniques and technologies that can enable adaptation (e.g., crop species that are more climate resilient). It has assessed the environmental performance of these technologies.</p> |

DATA REQUIREMENTS

The company should describe, if possible by referring to public or private documents and reports, the technical knowledge and tools developed that support governance and decision-making, as well as the techniques and technologies that enable adaptation. Whenever possible, the company should provide environmental assessments (GHG emissions, biodiversity impacts, human toxicity, resource depletion).

HOW THE ANALYSIS WILL BE DONE

The company should have developed technical knowledge and tools that support governance and decision-making (e.g., an online interface for each department of the company to enter relevant information regarding the risk analysis). The company should also have developed techniques and technologies that enable adaptation (e.g., humidity sensors). These should be adapted to the need of the company and regularly updated.

RATIONALE OF THE INDICATOR

Technical knowledge and tools that support decision-making are essential to enable adaptation. Specific techniques and technologies are also key levers for increasing adaptation capacity. They should be developed specifically to address the company's physical risks and adaptation needs.

8.2 INFORMATION AND MEDIATION

DESCRIPTION & REQUIREMENTS

8.2 INFORMATION AND MEDIATION

SHORT DESCRIPTION OF INDICATOR

This indicator reflects the implementation of information and mediation systems inside the company, dedicated to increasing the adaptation capacity of the company's employees.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|----------|--|---------------|---|
| The company has not engaged in the development of an information and mediation system. | | The company has started to inform its employees about climate change and the adaptation process. | | The company regularly informs its employees about climate change and adaptation, and the consequences on the company's business and working conditions. |

DATA REQUIREMENTS

The company shall describe the information and mediation system that is implemented internally, and how often the content is updated.

HOW THE ANALYSIS WILL BE DONE

The information and mediation system is intended to be accessible to all employees. The analysis should check whether the system is effective and up-to-date.

RATIONALE OF THE INDICATOR

Information-sharing between employees within the company, together with training, increase the adaptation capacity of the company. Indeed, it enables the sustainable integration of physical risks and adaptation issues and subjects in employees' missions.

8.3 R&D**DESCRIPTION & REQUIREMENTS****8.3 RESEARCH & DEVELOPMENT****SHORT DESCRIPTION OF INDICATOR**

This indicator takes into account the share of R&D dedicated to adaptation.

| Basic | Standard | Advanced | Next practice | Resilient |
|---|---|--|--|--|
| The share of adaption R&D is below 5% of total R&D investments. | The share of adaption R&D is between 5% and 10% of total R&D investments. | The share of adaption R&D is between 10% and 15% of total R&D investments. | The share of adaption R&D is between 15% and 20% of total R&D investments. | The share of adaptation R&D is above 20% of total R&D investments. |

DATA REQUIREMENTS

The company shall provide the amount of R&D investments dedicated to adaptation, with documents supporting it.

HOW THE ANALYSIS WILL BE DONE

The company should have a share of R&D investments dedicated to adaptation that is above 20% of the total R&D investments to reach the last level of maturity.

RATIONALE OF THE INDICATOR

In order to develop and implement new technologies and projects that can enable the company to adapt to climate change, R&D investments dedicated to adaptation are essential.

9. ADAPTATION CAPACITIES AND RESOURCES: HUMAN

9.1 WORKING CONDITIONS

DESCRIPTION & REQUIREMENTS

9.1 WORKING CONDITIONS

SHORT DESCRIPTION OF INDICATOR

This indicator takes into account how the company has analysed and assessed the potential impacts of climate change on its employees' health and working conditions, as well as if a plan to adapt to the negative consequences has been established.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|----------|--|---------------|---|
| The company has not done anything to adapt working conditions to climate change impacts. | | The company has assessed how physical risks can impact workers (indicator 5.2.3) and has started to establish an adaptation plan for working conditions. | | The company has assessed how physical risks can impact workers (indicator 5.2.3) and has established an adaptation plan for working conditions. |

DATA REQUIREMENTS

The company shall provide its adaptation plan for working conditions regarding the potential impacts on workers.

HOW THE ANALYSIS WILL BE DONE

The analysis should assess the company's working conditions, how it plans to adapt these to the impacts of climate change, and communications by the Human Resource Department.

RATIONALE OF THE INDICATOR

Climate change impacts can affect their health and working conditions through droughts, heatwaves or storms, for example. Thus, it is important for the company to assess the potential risks and to achieve an adaptation plan for working conditions.

9.2 TEAM TRAININGS

DESCRIPTION & REQUIREMENTS

9.2 TEAM TRAININGS

SHORT DESCRIPTION OF INDICATOR

This indicator takes into account employee training regarding physical risks and adaptation.

| Basic | Standard | Advanced | Next practice | Resilient |
|--|--|--|---|--|
| The company does not have any adaptation strategy regarding the training of its employees and its key decision makers. | The company has assessed the climate risks and adaptation training gaps and needs for its employees and key decision makers. | The company raises the awareness of its employees regarding physical climate risks and adaptation, especially the individual/committee with highest responsibility for climate change (i.e., indicator 1.2). | <p>Training of employees to physical climate risks and adaptation is in progress and almost completed, especially for the individual/committee with highest responsibility for climate change (i.e., indicator 1.2).</p> <p>Training applies to between 60% and 80% of employees.</p> | <p>The company carries out in-depth training about issues related to physical climate risks and adaptation for all employees, with content and objectives regularly updated, especially for the individual/committee with highest responsibility for climate change (i.e., indicator 1.2).</p> <p>Training applies to over 80% of employees.</p> |

DATA REQUIREMENTS

The company shall provide the percentage of employees trained and the content of the training. It should demonstrate how physical climate risks and adaptation issues are integrated into employees missions, projects and objectives by providing internal documentation. The company should declare if the climate head for climate change has received training (see indicator 1.2).

HOW THE ANALYSIS WILL BE DONE

The analysis is based on training and Human Resource documentations.

RATIONALE OF THE INDICATOR

The training of employees regarding physical risks and adaptation is essential to integrate these aspects into employees' missions and into corporate projects and policies.

6. Rating

6.1. SCORE

The ACT Adaptation rating is a number score from 0 (worst) to 20 (best). It is calculated using the score attributed to each indicator (see Section 5.3 and 5.4), based on the maturity matrices and their respective weightings.

The rating can be broken down into three sub-scores, Governance and Decision-Making, Physical Climate Risks and Adaptation, as a percentage, and while respecting the weightings attributed to each dimension.



TABLE 4: ACT ADAPTATION SCORING AND AN EXAMPLE

6.2. WEIGHTINGS

The indicator weights are shown in Table 5.

| DIMENSION | MODULE | INDICATOR | SUB-INDICATORS (IF EXISTING) | WEIGHTINGS | | |
|--|------------------------|--|-------------------------------------|------------|--------|-----------|
| | | | | INDICATOR | MODULE | DIMENSION |
| GOVERNANCE AND DECISION-MAKING | 1. INTERNAL GOVERNANCE | 1.1 Long-term vision and corporate projects | | 3% | 6% | 20% |
| | | 1.2 The climate head | | 3% | | |
| | 2. EXTERNAL GOVERNANCE | 2.1 Territorial strategy | | 2% | 6% | |
| | | 2.2 Other stakeholders | | 2% | | |
| | | 2.3 Do not Significant Harm Principle | | 2% | | |
| | 3. DECISION-MAKING | 3.0 Methods, indicators and tools | | 8% | 8% | |
| | PHYSICAL CLIMATE RISKS | 4. ANALYSIS | 4.1 Data and scenarios | | 5% | |
| 4.2 Stake level on the value chain | | | 5% | | | |
| 5. HAZARDS, EXPOSURE, SENSITIVITY AND IMPACTS OF THE VALUE CHAIN PARTS | | 5.1 Raw materials | 5.1.1 Hazards (2%) | | 6% | |
| | | | 5.1.2 Exposure and sensitivity (2%) | | | |
| | | | 5.1.3 Impacts (2%) | | | |
| | | 5.2 Production, operations, processes and infrastructure | 5.2.1 Hazards (2%) | | 6% | |
| | | | 5.2.2 Exposure and sensitivity (2%) | | | |
| | | | 5.2.3 Impacts (2%) | | | |
| | | 5.3 Networks and systems (water, energy and telecommunication) | 5.3.1 Hazards (2%) | | 6% | |
| | | | 5.3.2 Exposure and sensitivity (2%) | | | |
| | | | 5.3.3 Impacts (2%) | | | |
| | | 5.4 Logistics and transport | 5.4.1 Hazards (2%) | | 6% | |
| | | | 5.4.2 Exposure and sensitivity (2%) | | | |
| | | | 5.4.3 Impacts (2%) | | | |
| | | 5.5 Demand and sales | 5.5.1 Hazards (2%) | | 6% | |
| 5.5.2 Exposure and sensitivity (2%) | | | | | | |
| 5.5.3 Impacts (2%) | | | | | | |

| | | | | | |
|--|---------------------------------------|---|----|-----|-----|
| ADAPTATION CAPACITIES AND RESOURCES | 6. ORGANIZATION | 6.1 Internal and external skills in climate change adaptation | 3% | 10% | 40% |
| | | 6.2 Diversification of activities | 3% | | |
| | | 6.3 Company context and updates of adaptation measures | 3% | | |
| | 7. FINANCE | 7.1 Assessment of stranded assets | 4% | 10% | |
| | | 7.2 Assessment of climate externalities | 2% | | |
| | | 7.3 Provision, insurance and investments for action plan | 4% | | |
| | 8. TECHNIQUES AND TECHNOLOGIES | 8.1 Technical support and technologies | 5% | 10% | |
| | | 8.2 Information and mediation | 2% | | |
| | | 8.3 R&D | 3% | | |
| | 9. HUMAN | 9.1 Working conditions | 5% | 10% | |
| | | 9.2 Team trainings | 5% | | |

TABLE 5: ACT ADAPTATION WEIGHTINGS

Rationale

The ACT Adaptation methodology is composed of three dimensions.

Governance and Decision-Making dimension – 20%

This dimension has its weightings distributed fairly equally. Module 3.0 Decision-Making has a slightly higher weighting of 8%, compared to 6% for the others. This is because this module includes all the methods, indicators and tools in place that support the company's physical climate risks and adaptation decision making. The indicators in the internal and external governance dimensions have an equal weighting since they contribute equally to the company's general governance of physical risks and adaptation.

Physical Climate Risks dimension – 40%

The Analysis module has a weighting of 10%. Data and scenario analysis (indicator 4.1), as well as the part of the value chain the most at stake for the company (indicator 4.2) are first steps. The analysis of hazards, exposure and sensitivity and impacts for each part of the value chain are

attributed an equal weighting of 2%. Thus, each part of the value chain is weighted at 6%. The analyst can decide to change the weightings from indicators 5.1 to 5.5 (see the Calculation rule below).

Adaptation capacities and resources dimension – 40%

The four resources and capacities of the Adaptation dimension, (organisation, finance, techniques and technologies, and human), are attributed an equal weighting of 10% each. Within the organization module and the human one, weightings are distributed equally since they contribute at a same level to their respective adaptation capacity. Within the finance module, the indicator 7.1 Assessment of stranded assets and 7.3 Provision, insurance and investments for action plan, have a higher weighting. This is because they are two essential aspects to assess the company's performance and viability when facing climate change impacts. Within the technics and technology module, the indicator 8.1 Technical support and technologies has the higher weighting since it includes two important aspects of adaptation capacity: technical knowledge and tools supporting the governance and decision-making, and the technics and technologies that can enable adaptation (e.g., crop species that are more climate resilient).

Calculation rule

Indicator 4.2 “Stake level on the value chain” is linked to the company's ability to determine which activities and parts of the value chain (between the ones presented in the indicators 5.1 to 5.5) are essentials to the company and its operations. These activities cannot be affected by physical risks without critically impacting the company. The company can thus do an in-depth and precise analysis on these specifics activities and value chain parts.

As a consequence, if one or several indicators from 5.1 to 5.5 are not relevant to the company, the analyst can decide to attribute a weighting of 0% to the corresponding indicator. A maximum of three indicators can be removed from the analysis. This decision should be done according to the analysis in the indicator 4.2 and according to the principle of Relevance (see the ACT Principles in Section 2). The weightings of the removed indicators should be redistributed proportionally among the remaining indicators from 5.1 to 5.5. Once the analyst has decided to keep a part of the value chain in its assessment through the related indicator, they should analyse the three sub-indicators (Hazards, Exposure and sensitivity, Impacts). The weightings of the module and the dimension remain unchanged.

For example, if the analyst has determined in indicator 4.2 that Production (indicator 5.2) and Raw materials (indicator 5.1) are the most critical parts of the value chain, the indicators 5.3, 5.4 and 5.5 may be remove from the analysis. Thus, 18% (3 indicators x 6%) weightings have to be redistribute among the two remaining indicators. Indicators 5.1 and 5.2 get an addition of 9% weighting each, to reach 15% (6% + 9% added) each.

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8. Glossary

ACTIONS THAT DO NOT (SIGNIFICANTLY) HARM MITIGATION, BIODIVERSITY, HEALTH AND POLLUTION

According to the European Taxonomy proposed by the Technical Expert Group, economic activities making a substantial contribution to climate change mitigation or adaptation must be assessed to ensure they do not cause significant harm to all remaining environmental objectives. An activity contributing to climate change adaptation must avoid significant harm to climate change mitigation and the other four environmental objectives (and vice versa):

- Sustainable use and protection of water and marine resources
- Transition to a circular economy, waste prevention and recycling
- Pollution prevention and control
- Protection of healthy ecosystems

This assessment ensures that progress against some objectives are not made at the expense of others and recognises the reinforcing relationships between different environmental objectives. (TEG, 2020)

ADAPTATION

The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.

Adaptation options exist in all sectors, but their context for implementation and potential to reduce climate-related risks differs across sectors and regions. Some adaptation responses involve significant co-benefits, synergies and trade-offs. Increasing climate change will increase challenges for many adaptation options.

Adaptation and mitigation responses are underpinned by common enabling factors. These include effective institutions and governance, innovation and investments in environmentally sound technologies and infrastructure, sustainable livelihoods and behavioural and lifestyle choices. (IPCC, 2014)

ADAPTIVE CAPACITY

The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences. (IPCC, 2014)

CLIMATE PROJECTION

A climate projection is the simulated response of the climate system to a scenario of future emission or concentration of greenhouse gases (GHGs) and aerosols, generally derived using climate models. Climate projections are distinguished from climate predictions by their dependence on the emission/concentration/radiative forcing scenario used, which is in turn based on assumptions concerning, for example, future socio-economic and technological developments that may or may not be realized. (IPCC, 2014)

| | |
|------------------------------------|---|
| CLIMATE-RELATED OPPORTUNITY | It is the potential positive impacts related to climate change on an organisation. It will vary depending on the region, market and industry in which an organisation operates. |
| | In the ACT framework, climate-related opportunity focuses on opportunities to adapt to market shifts driven by physical climate impacts and cater to any resulting new market needs, that is to say, the fundamental shifts in climate over the longer term may affect value chains and drive new consumer needs. For example, technology to keep buildings cool, along with water- and energy-efficient technologies, or crops that are better suited to chronic changes in precipitation and temperature. (EBRD) |
| EMISSION SCENARIO | A plausible representation of the future development of emissions of substances that are potentially radiatively active (e.g., greenhouse gases (GHGs), aerosols) based on a coherent and internally consistent set of assumptions about driving forces (such as demographic and socio-economic development, technological change, energy and land use) and their key relationships. Concentration scenarios, derived from emission scenarios, are used as input to a climate model to compute climate projections. (IPCC, 2014) |
| EXPOSURE / EXPOSURE | The presence of people; livelihoods; species or ecosystems; environmental functions, services, and resources; infrastructure; or economic, social, or cultural assets in places and settings that could be adversely affected. (IPCC, 2014) |
| EXPOSURE METRICS | Metrics designed to assess the degree to which a company's value chain (e.g., assets, operations, supply chain, customers) has the potential to be impacted by physical climate hazards due to its geographic location. These metrics should link part of a company's value chain (e.g., physical assets) with specific physical climate hazards (e.g., tropical cyclones). (IPCC, 2014) |
| FINANCIAL RESOURCES | It is the funds available to implement its adaptive capacity. (ADEME, 2019) |
| HAZARDS | <p>The potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. In this report, the term hazard usually refers to climate-related physical events or trends or their physical impacts.</p> <p>Thus, it includes processes that range from brief events, such as severe storms, to slow trends, such as multi-decade droughts or multi-century sea level rise.</p> <p>(IPCC, 2014)</p> <p>A climate hazard should be appreciated in function of its likelihood, magnitude and duration.</p> |
| HUMAN RESOURCE | It is the internal skills and working time that the company uses to improve its adaptive capacity. (ADEME, 2019) |

ORGANIZATIONAL CAPACITY

It is the governance bodies, exchanges, decision-making processes and the management mode that contribute to its adaptive capacity. (ADEME, 2019)

PHYSICAL CLIMATE RISKS

The potential for negative consequences from physical climate events or trends.

Acute physical risks refer to those that are event-driven, including increased severity of extreme weather events, such as tropical cyclones or floods.

Chronic physical risks are longer-term shifts in climate patterns (e.g., sustained higher temperatures) that may cause sea level change or chronic heat waves.

Risks from climate change impacts arise from the interaction between hazard (triggered by an event or trend related to climate change), vulnerability (susceptibility to harm) and exposure (people, assets or ecosystems at risk). (IPCC, 2014)

The classification of physical hazards is the following :

| CHRONIC PHYSICAL HAZARDS | Includes | Definition |
|--|------------------------|--|
|  Sustained temperature rise | Urban heat island | A gradual increase in overall temperature. |
|  Change in precipitation patterns | | Increase or decrease in precipitation annually and seasonally. |
|  Water Stress | Degraded water quality | High ratio of total water withdrawals to available renewable surface and groundwater supplies. |

| | | | |
|--|---------------------------------|-----------------|---|
| | Sea level change | Coastal erosion | Change to the height of sea level, both globally and locally (relative sea level change) at seasonal, annual, or longer time scales due to (1) a change in ocean volume as a result of a change in the mass of water in the ocean (e.g., due to melt of glaciers and ice sheets), (2) changes in ocean volume as a result of changes in ocean water density (e.g., expansion under warmer conditions), (3) changes in the shape of the ocean basins and changes in Earth's gravitational and rotational fields, and (4) local subsidence or uplift of the land. |
| | Ocean acidification | | Ocean acidification refers to a reduction in the pH of the ocean over an extended period, typically decades or longer, which is caused primarily by uptake of carbon dioxide (CO ₂) from the atmosphere, but can also be caused by other chemical additions or subtractions from the ocean. Anthropogenic ocean acidification refers to the component of pH reduction that is caused by human activity. |
| | Ice melt/permafrost melt | | Progressive loss of sea ice, glacier, or ground (soil or rock and included ice and organic material) that remains at or below 0°C for at least two consecutive years. |

| ACUTE/EXTREME PHYSICAL HAZARDS | Includes | Definition |
|--------------------------------|-----------------------------|--|
| | Extreme temperatures | <p>Freeze</p> <p>_____</p> <p>Heat wave</p> <p>Temperature that is rare (unusually low or high) in a particular place and at a particular time of year. An extreme event would normally be as rare as or rarer than the 10th or 90th percentile of a probability density function estimated from observations.</p> |

| | | |
|--|--|--|
|  Drought | Severe low-water levels | A period of abnormally dry weather long enough to cause a serious hydrological imbalance. Drought is a relative term; therefore any discussion in terms of precipitation deficit must refer to the particular precipitation-related activity that is under discussion. A period with an abnormal precipitation deficit is defined as a meteorological drought. A megadrought is a very lengthy and pervasive drought, lasting much longer than normal, usually a decade or more. |
|  Wildfires | | Uncontrolled fires that burn in wildland vegetation, often in rural areas. |
|  Extreme precipitation | | Precipitation that is rare (unusually low or high) in a particular place and at a particular time of year. An extreme event would normally be as rare as or rarer than the 10th or 90th percentile of a probability density function estimated from observations. |
|  Hail | | A form of precipitation consisting of solid ice. |
|  Extreme sea level (storm surge) | | The temporary increase, at a particular locality, in the height of the sea due to extreme meteorological conditions (low atmospheric pressure and/or strong winds). |
|  Flood | River Flood <hr/> Pluvial Flood <hr/> Groundwater Flood <hr/> Coastal Flood | The overflowing of the normal confines of a stream or other body of water, or the accumulation of water over areas not normally submerged. Floods include river (fluvial) floods, flash floods, urban floods, pluvial floods, sewer floods, coastal floods and glacial lake outburst floods. |
|  Landslides | Mass movements | A mass of material that has moved downhill because of gravity, often assisted by water when the material is saturated. |

| | | |
|---|---|---|
| | Shrinkage-swelling of clay soils (SSCS) | Clay soils can have their consistency change according to their water content. In a humid context, a clayey soil appears supple and malleable, while the same soil dried out will be hard and brittle. Variations of volume more or less consequent according to the structure of the soil and the minerals in presence, accompany these modifications of consistency. |
|  | Extreme winds | Storm Wind speed that is rare (unusually low or high) in a particular place and at a particular time of year. An extreme event would normally be as rare as or rarer than the 10th or 90th percentile of a probability density function estimated from observations. |
|  | Tornadoes | A violently rotating column of air touching the ground; usually attached to the base of a thunderstorm. |
|  | Tropical cyclones | The general term for a strong, cyclonic-scale disturbance that originates over tropical oceans. Distinguished from weaker systems (often named tropical disturbances or depressions) by exceeding a threshold wind speed. A tropical storm is a tropical cyclone with 1-minute average surface winds between 18 and 32 m s ⁻¹ . Beyond 32 m s ⁻¹ , a tropical cyclone is called a hurricane, typhoon, or cyclone, depending on geographic location. |
|  | Dust Storm | The result of terminal winds raising large quantities of dust into the air and reducing visibility at eye level (1.8 meters) to less than 1,000 meters. |

Note: The definitions of these hazards from the WRI and the IPCC are examples, any other relevant definition and corresponding indicator will be appropriate.

Sources : WRI based on a review of reports from the IPCC (2014a, 2021, 2018, 2019a, 2019b), Géorisques, and adapted from I4CE

REPRESENTATIVE CONCENTRATION PATHWAYS (RCP)

Scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases (GHGs) and aerosols and chemically active gases, as well as land use/land cover (Moss et al., 2008). The word representative signifies that each RCP provides only one of many possible scenarios that would lead to the specific radiative forcing characteristics. The term pathway emphasizes that not only the long-term concentration levels are of interest, but also the trajectory taken over time to reach that outcome (Moss et al., 2010).

RCPs usually refer to the portion of the concentration pathway extending up to 2100, for which Integrated Assessment Models produced corresponding emission scenarios. Extended Concentration Pathways (ECPs) describe extensions of the RCPs from 2100 to 2500 that were

calculated using simple rules generated by stakeholder consultations and do not represent fully consistent scenarios.

Four RCPs produced from Integrated Assessment Models were selected from the published literature and are used in the present IPCC Assessment as a basis for the climate predictions and projections presented in WGI AR5 Chapters 11 to 14 (IPCC, 2013b):

RCP2.6

One pathway where radiative forcing peaks at approximately 3 W/m² before 2100 and then declines (the corresponding ECP assuming constant emissions after 2100). RCP2.6 is representative of a scenario that aims to keep global warming likely below 2°C above pre-industrial temperatures. The increase of global mean surface temperature by the end of the 21st century (2081–2100) relative to 1986–2005 is *likely* to be 0.3°C to 1.7°C under RCP2.6.

RCP4.5 and RCP6.0

Two intermediate stabilization pathways and scenarios in which radiative forcing is stabilized at approximately 4.5 W/m² and 6.0 W/m² after 2100 (the corresponding ECPs assuming constant concentrations after 2150). The increase of global mean surface temperature by the end of the 21st century (2081–2100) relative to 1986–2005 is *likely* to be 1.1°C to 2.6°C under RCP4.5, 1.4°C to 3.1°C under RCP6.0.

RCP8.5

It is the scenario with very high GHG emissions. One high pathway for which radiative forcing reaches >8.5 W/m² by 2100 and continues to rise for some amount of time (the corresponding ECP assuming constant emissions after 2100 and constant concentrations after 2250). Scenarios without additional efforts to constrain emissions ('baseline scenarios') lead to pathways ranging between RCP6.0 and RCP8.5. The increase of global mean surface temperature by the end of the 21st century (2081–2100) relative to 1986–2005 is *likely* to be 2.6°C to 4.8°C under RCP8.5.

Relative to 1850–1900, global surface temperature change for the end of the 21st century (2081–2100) is projected to *likely* exceed 1.5°C for RCP4.5, RCP6.0 and RCP8.5 (*high confidence*). Warming is *likely* to exceed 2°C for RCP6.0 and RCP8.5 (*high confidence*), *more likely than not* to exceed 2°C for RCP4.5 (*medium confidence*), but *unlikely* to exceed 2°C for RCP2.6 (*medium confidence*).

(IPCC, 2014)

RESILIENCE

The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation. (IPCC, 2014)

STRANDED ASSETS

Investments already made but which, before the end of their economic life (assumed at the time of the investment decision), are no longer able to provide an economic return, as a result of climate change impacts and related physical risks to the assets in question. For example, a hydraulic dam for which the future decline in rainfall and the increase in droughts will not have been considered (IEA).

TECHNICAL

The technologies, techniques and new solutions that contribute to improving its adaptive capacity. (ADEME, 2019)

RESSOURCES

THRESHOLD

Identifying the stages beyond which the operation of a system is significantly or irreversibly compromised, and understanding how climate change interacts with these functional thresholds, threshold analysis allows to identify different levels of risk.

The identification of these different risks thresholds in space and time then allows to prioritize and sequence incremental adaptation solutions. (ADEME, 2020)

TRANSFORMATION

A change in the fundamental attributes of natural and human systems. (IPCC, 2014)

VULNERABILITY / SENSITIVITY

The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt. (WRI, 2021)

VULNERABILITY METRICS

Metrics designed to assess the propensity of different parts of a company's value chain to suffer negative impacts when exposed to and then impacted by physical climate hazards. These metrics should assess specific characteristics of a company's value chain (e.g., water intensity) that may make that part of the value chain more or less likely to suffer negative impacts from physical climate hazards. (WRI, 2021)

Appendix 1: basic concepts of physical risk assessment

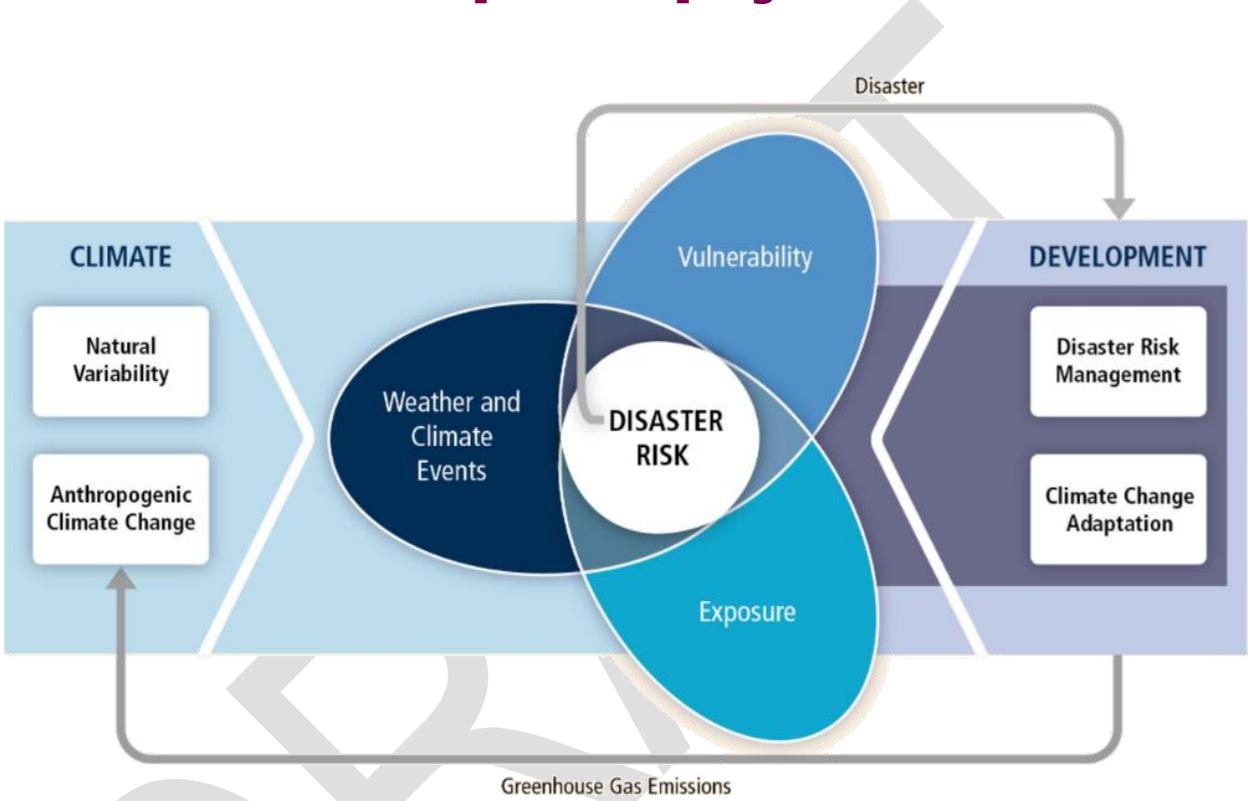


FIGURE 2: THE KEY CONCEPTS INVOLVED IN DISASTER RISK MANAGEMENT AND CLIMATE CHANGE ADAPTATION (FROM IPCC, 2012)

| Vulnerability Exposure | Vulnerability | | | | | Vulnerability & Exposure Hazard | Vulnerability & Exposure | | | | |
|---------------------------|---------------|-----------|----------|----------|----------|------------------------------------|--------------------------|-------------|-------------|-------------|------------|
| | Very high | High | Moderate | Low | Very low | | Very high | High | Moderate | Low | Very low |
| Very high | Very high | Very high | High | High | Moderate | Very high | Severe | Severe | Significant | Significant | Moderate |
| High | Very high | High | Moderate | Moderate | Low | High | Severe | Significant | Moderate | Moderate | Minor |
| Moderate | High | Moderate | Moderate | Moderate | Low | Moderate | Significant | Moderate | Moderate | Moderate | Minor |
| Low | High | Moderate | Moderate | Low | Very low | Low | Significant | Moderate | Moderate | Minor | Negligible |
| Very low | Moderate | Low | Low | Very low | Very low | Very low | Moderate | Minor | Minor | Negligible | Negligible |

FIGURE 3: EXAMPLES OF RISK MATRIX FOR PHYSICAL RISKS AND ADAPTATION (CHING-PIN TUNG AND AL., WATER 2019)