



EUROPEAN CENTRAL BANK
BANKING SUPERVISION

Good practices for climate-related and environmental risk management

Observations from the 2022
thematic review

BANKENTOEZICHT

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1 Introduction

1.1 Background

With the publication of the ECB Guide on climate-related and environmental (C&E) risks (“the Guide”) in November 2020, the ECB set out the view that institutions should take a strategic, forward-looking and comprehensive approach to considering climate-related and environmental risks.¹ Institutions were then requested in early 2021 to perform a self-assessment of their current practices against the expectations set out in the Guide and to inform the ECB of their implementation plans to advance the management of climate-related and environmental risks. In 2022 the ECB launched the thematic review, which involved conducting deep dives into institutions’ climate-related and environmental risk strategies, as well as their governance and risk management frameworks and processes. The ECB has identified a set of good practices originating from a range of institutions across various business models and sizes to meet the supervisory expectations set out in the Guide.

1.2 Objective

This report is a key supervisory publication which shares observations and good practices illustrating the different ways that significant institutions can align their practices with the supervisory expectations set out in the Guide. It serves as a compendium to the ECB report on the results of the 2022 thematic review on climate-related and environmental risks.² With this compendium, the ECB also aims to respond to the wish from industry for insights on good practices. The compendium should also be read in conjunction with the ECB’s report on good practices observed in the climate-related stress test to be published later this year. While the report on climate-related stress testing will focus primarily on stress testing and risk modelling, this report covers observed practices related to strategy-setting, governance and risk appetite, as well as risk management.

It should be noted that the good practices outlined in the compendium merely serve as an illustration that could help institutions make progress on managing C&E risks. The practices are not necessarily replicable, nor do they necessarily ensure alignment with supervisory expectations. They may have been amended and/or augmented with comparable practices from other institutions for illustrative purposes. Moreover, institutions should consider applicability of the good practices in the light of their overall approach to managing C&E risks. The ECB also emphasises the evolving nature of good practices and expects these to mature over time. This report should be read in conjunction with the ECB’s Guide and the prudential requirements set out in the regulatory framework and, more particularly, the Capital Requirements

¹ ECB, “[ECB Guide on climate-related and environmental risks – supervisory expectations relating to risk management and disclosure](#)”, November 2020.

² ECB, “[Banks gearing up to manage risks from climate change – results of the 2022 thematic review on climate-related and environmental risks](#)”, November 2022.

Regulation and Capital Requirements Directive, as further specified in European Banking Authority guidelines.

1.3 Overview of good practices

The 2022 thematic review demonstrated that a group of institutions are deploying leading practices in one or more areas, leading the way towards full alignment with the expectations. This report describes in detail a selection of observed good practices at significant institutions within the Single Supervisory Mechanism. The report comprises 26 good practices in total, drawn from over 25 different institutions. The fact that these good practices have been observed in such a large variety of institutions demonstrates the sector's innovative ability to address the prevailing challenges related to climate change and environmental degradation.

Table 1

Observed good practices described in this report

Section	Sub-section	#	Topic	Expectation
Materiality	Identification of risk drivers	2.1.1	Transmission channels	1, 7.1
	Identification of exposures	2.2.1	Materiality assessments	7.2, 7.3
	Determination of materiality	2.3.1	Materiality thresholds	1, 7.2
Business strategy	Strategic approaches	3.1.1	Transition planning	2
		3.1.2	Key performance indicators	2
		3.1.3	Products	2
	Strategic steering tools	3.2.1	Client engagement	2, 7.4
		3.2.2	Client transition plans	2, 7.4
Governance and risk appetite	Management body	4.1.1	Governance framework	3, 5.2
	Remuneration	4.2.1	Remuneration policies	4.3
	Organisational structure	4.3.1	Second line of defence	5.4, 5.5
		4.3.2	Third line of defence	5.6
	Risk appetite	4.4.1	Key risk indicators	4
	Reporting	4.5.1	Data governance, processes and collection	6.1, 6.2, 6.4
		4.5.2	Internal risk reporting	6.3
Risk management	Due diligence	5.1.1	Data collection	7.5, 8.1
		5.1.2	Controversies	7.5, 9.2
	Risk classification	5.2.1	Credit risk	8.2, 8.4
		5.2.2	Market risk	10
		5.2.3	Operational risk	9.1
	Collateral valuations and pricing	5.3.1	Collateral valuations	8.3
		5.3.2	Loan pricing	8.5, 8.6
	Capital adequacy	5.4.1	Internal capital adequacy assessment	7.6
	Environmental risks	5.5.1	Exclusion approach	8.1
		5.5.2	Due diligence	7.5
		5.5.3	Risk measurement	7

2 Assessment of materiality

According to Article 73 of the Capital Requirements Directive, institutions shall have in place sound, effective and comprehensive strategies and processes to assess and maintain on an ongoing basis the amounts, types and distribution of internal capital that they consider adequate to cover the nature and level of the risks to which they are or might be exposed. In addition to any existing material risks, the institution is expected to consider any risks, and any concentrations within and between those risks, that may arise from pursuing its strategies or from relevant changes in its operating environment. Against that backdrop, the assessment of materiality plays a critical role in institutions' internal capital adequacy assessment process (ICAAP), risk management and overall strategy.

To conduct a proper assessment of materiality, institutions typically develop a well-informed understanding of all relevant C&E risk drivers and assess the ways in which – i.e. through which transmission channels – these could affect the prudential risks they are exposed to (Section 2.1). By means of a risk identification process, institutions then assess which risk drivers are – or are likely to be – material in view of their (concentrations to) exposures. To determine materiality, the institution leverages qualitative and quantitative approaches to assess the level of risk against a predetermined materiality threshold (Section 2.2). The outcome of the materiality assessment informs the required follow-up actions for integration of C&E risks in the risk management framework (Section 2.3). This section describes observed good practices at each of these stages in the assessment of materiality of C&E risks. Typically, these observed practices are part of the institutions' risk identification procedure under the ICAAP framework.

Table 2
Good practices in materiality assessment

Section	Topic	Description	Expectation
Identification of risk drivers	Transmission channels	Mapping out risk drivers to identify transmission channels	1, 7.1
Identification of exposures	Materiality assessments	Risk assessment methods to assess materiality of exposures	7.2, 7.3
Determination of materiality	Materiality thresholds	Setting materiality thresholds and follow-up actions	1, 7.2

2.1 Identification of risk drivers

A systematic identification of the relevant risk drivers is a prerequisite for sound risk management. Institutions broadly recognise C&E risks as risk drivers that materialise in existing risk categories and distinguish between the various drivers of transition and physical risks. The extent and granularity of identified risk drivers and the mapping of transmission channels varies across institutions. Leading institutions take into account the full spectrum of risk drivers stemming from climate change and

environmental degradation, considering where possible their distinctive characteristics, such as their forward-looking nature. Typically, this mapping of C&E risk drivers and transmission channels is reflected in institutions' risk inventory.

2.1.1

Good practice for transmission channels

Seeing the forest from the trees – mapping climate-related and environmental risk drivers

Expectation 1

Institutions are expected to understand the impact of climate-related and environmental risks on the business environment in which they operate, in the short, medium and long term, in order to be able to make informed strategic and business decisions.

Expectation 7.1

Institutions are expected to have a holistic and well-documented view of the impact of climate-related and environmental risks on existing risk categories.

To determine the materiality of C&E risks, institutions have developed a bottom-up risk identification process to identify relevant risk drivers. This annual procedure is organised as follows.

The risk identification procedure relies on internal and external sources of knowledge. Internally, institutions identify relevant departments along first, second and third lines of defence with specific expertise on C&E risks. Externally, the institution relies on scientific literature, climate scenarios (e.g. scenarios developed by the Intergovernmental Panel on Climate Change (IPCC) or the Network for Greening the Financial System (NGFS)) and publications from internationally renowned bodies. These inputs are used to generate an overview of relevant risk drivers related to climate change and environmental degradation. The table below outlines a non-exhaustive list of observed risk drivers.

Table 3

Non-exhaustive list of observed primary risk drivers

Physical risk drivers		Transition risk drivers	
Climate-related risk	Other environmental risk	Climate-related risk	Other environmental risk
Heat waves and wildfires	Earthquakes, volcanos	Environmental taxation and subsidies	
Droughts	Over-fishing, illegal fishing vessels, controversial practices or aquaculture techniques	Regulatory requirements (e.g. sustainability certificates, disclosures)	
Riverine and sea floods	Water stress and pollution	Behavioural changes of consumers, suppliers, employees	
Hail, storms and hurricanes	Soil pollution by hazardous materials, excessive fertilisation, soil erosion (over-exploitation)	Behavioural changes of investors	
Rising sea levels	Deforestation and unconventional site clearance	Technological developments	
Changing rainfall patterns	Animal welfare (controversial living conditions, use of chemicals)	Energy and transport policies (e.g. reduction of CO2 emissions)	Ban of certain environmentally damaging materials/chemicals
Reduced soil productivity	Invasive species/disruption of natural systems	Climate protectionism	Animal testing rules
Lack of sunshine and wind	Biodiversity loss (loss of flora/fauna)		

As a next step, institutions develop a process to determine which risk drivers could potentially have a material impact on their risk profile and operations (for example, in terms of financial losses, business disruptions or legal claims and reputational damages). Following the initial identification of risk drivers, one institution uses heatmapping to determine the severity level of each of the identified physical and

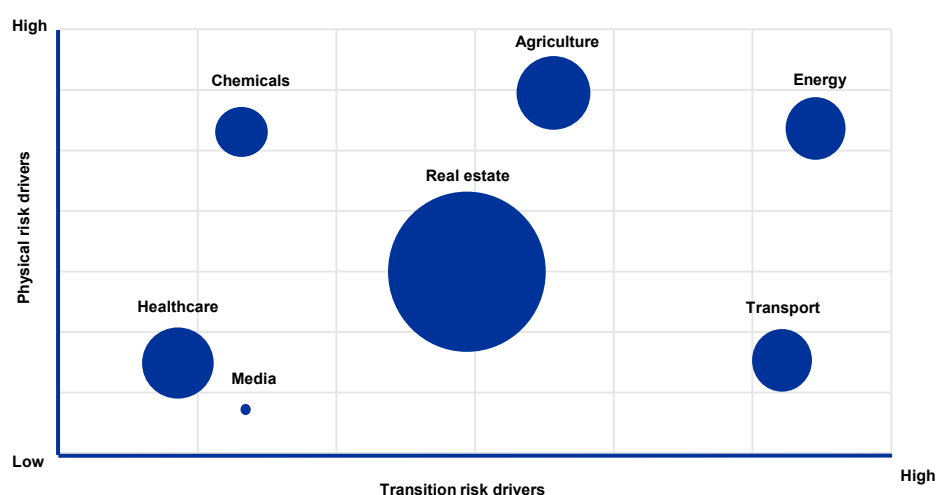
transition risk drivers for each of the sectors in which it is active (using the most granular NACE sector classification). Each driver – for example flood risk, resource scarcity or biodiversity loss – receives a severity level for each of the NACE sectors onto which it is mapped. The judgement on the expected level of severity within the next five years is informed by available data sources (e.g. emissions data, re-insurance data for extreme weather events, third-party ratings) and expert judgement by sector specialists. The overall severity for physical risks and for transition risk for each sector is decided by the highest sub-risk driver score. Dedicated interviews and workshops are organised with sector specialists to get a comprehensive view of the risks and trends. The outcome of the heatmapping exercise informs the institutions' follow-up actions in terms of measuring the materiality of the risks and allocating relevant resources within the organisation (see also the good practice for setting materiality thresholds in Section 2.3).

Chart 1

Stylised visualisation of heatmap results to identify which risk drivers are material

Sector portfolio exposure to physical and transition risk drivers

(size of the bubble indicates exposure at default)



2.2 Identification of exposures

Institutions are exposed to C&E risks through their exposures to, inter alia, corporates, small and medium-sized enterprises (SME), households and sovereigns. Depending on the type of exposure, different qualitative and quantitative approaches are used to assess the materiality of the risks. Institutions typically rely on proxy-based quantification methods to identify pockets of risk based on both client data and externally sourced data. Leading institutions supplement such initial analyses with a variety of more advanced assessment methods to estimate the level of risk more accurately, including portfolio alignment approaches, sensitivity analysis and financed emissions. The observed practices described in this section include some

of the qualitative and quantitative approaches that institutions use to determine the materiality of C&E risks.

2.2.1

Good practice for materiality assessment

Getting your feet wet – risk assessment methods to assess the materiality of exposures

Expectation 7.2

Institutions are expected to comprehensively include climate-related and environmental risks in their assessment of materiality for all of their business areas in the short, medium and long term under various scenarios.

Expectation 7.3

Institutions are expected to adequately quantify the climate-related and environmental risks that the institution is exposed to.

Depending on the type of exposure and risk driver in scope, institutions deploy different qualitative and quantitative approaches to assess the materiality of the risks. Institutions typically use qualitative approaches supplemented by proxy-based quantitative information. More advanced institutions use scenario analyses to assess the impact on either probability of default (e.g. through changes in client revenues/costs) or loss given default (e.g. through changes in the value of collateral) for exposures with credit risk or loss estimates for exposures with market risk and operational risk. The table below provides a selection of observed analyses with varying levels of complexity used to assess materiality for physical and transition risk drivers.

Table 4

Selection of observed risk assessment methods to inform the materiality assessment

Risk driver	Complexity	Type of analysis	Portfolios in scope	Description
Physical risk	Low	Exposure analysis	Wholesale	An institution identifies physical risk drivers by sector based on the work of an international climate research agency. It assigns a sensitivity score from very low to very high to each sector taking into consideration the vulnerability of the specific economic activities (e.g. power generation) to a physical vulnerability (e.g. drought). It does so by geography, creating a sector-geography matrix of impact scores. It subsequently maps its exposures to the associated matrix and adds up its exposures by sensitivity score to produce a first heat map of geographies and physical risk drivers. The heat map is used to determine areas for deeper analysis.
	Medium	Sensitivity analysis	Trading portfolio (equity, FX, commodity)	An institution develops several stress scenarios to assess and quantify the impact on profit and loss (P&L) of extreme weather events (i.e. droughts, heatwaves, floods) for its trading book. Each scenario considers different shocks based on historical events (e.g. large/small sell-off; interest rate and FX shocks, credit spreads). A sensitivity-based simulation is performed to model the impact of shocks on individual positions, aggregating the results to determine the impact on P&L and solvency position at portfolio level.
	Medium	Business continuity analysis	Business operations and IT servers	An institution identifies relevant physical risk events affecting its personnel, data, services and facilities, and uses forward-looking flood, drought and wildfire maps from external data providers. Formulating several scenarios, the institution then assesses which of its office buildings, recovery sites and third-party vendors (e.g. data centres) may be exposed to those risk events and forms a qualitative conclusion on the materiality of the risks for each of its operations.
	High	Collateral analysis	Commercial and residential real estate	An institution performs a location-specific risk analysis to quantify physical risks using geospatial mapping and local geographical characteristics (e.g. building type, the type of surrounding terrain, the features of the construction, (public) transport routes). Using natural hazard maps (e.g. for floods, droughts and wildfires), the model constructs vulnerability curves for building type clusters at postal code level. This allows the institution to calculate risk estimates, also taking into account any general hazard protection and/or building-specific mitigation that may be in place. These risk estimates are translated into expected damages and losses to the collateral portfolio.

Risk driver	Complexity	Type of analysis	Portfolios in scope	Description
Transition risk	Low	Exposure analysis	Commercial and residential real estate	An institution maps its exposures to buckets of energy performance certificates and breaks these down into clients with low, medium, high and very high risk using its internal classification system. This provides an overview of exposures to high-risk clients that may be particularly affected by rising energy costs and/or may have limited means to invest in renovation measures.
	Low	Country analysis	Sovereigns	An institution evaluating the risk that a country could accumulate payment arrears on its external debt due to C&E risks. The methodology is built on publicly available data sources for transition risk (e.g. dependence on energy imports, CO2 emissions per capita, energy production mix, energy intensity of GDP) and physical risk (e.g. agriculture share in GDP, share of population living below a given elevation). The analysis also takes into account countries' climate policy frameworks. The assessment yields a view of the concentration of exposure to sovereigns with elevated C&E risks.
	Medium	Qualitative scenario analysis	All	An institution assessed reputation risks, including those related to potential greenwashing and financing of polluting industries. The institution defined a set of scenarios and mapped the possible affected stakeholders (e.g. investors, customers, authorities and interest groups) and the P&L area that would be most affected. In a second step, the institution quantified, based on expert judgement, and considering historical loss figures, possible losses that could arise using specific case studies. The experts individually estimated lowest, highest and median plausible values for losses within a given confidence level. These were discussed and adjusted in dedicated workshops before they were aggregated to produce a quantitative approximation.
	High	Portfolio alignment	Commercial and residential real estate	An institution uses a carbon risk real estate risk monitoring tool to measure whether its real estate portfolio is aligned with EU decarbonisation scenarios. In addition to data on a building's energy consumption, the institution collects relevant C&E risk metrics for each collateral (e.g. building type, renovation measures, building materials, EPCs, public transport connections). An institution assesses the likelihood of collateral becoming non-compliant with EU regulations (i.e. a stranded asset) and develops a view on materiality for its real estate portfolios.

2.3 Determination of materiality

As part of the process for identifying all material risks, institutions are expected to determine materiality on at least an annual basis using its internal definition. Institutions are expected to adopt a strategic approach to address all their material C&E risks, using a full array of risk management instruments. The good practice below describes the thresholds that institutions have used in this context and the follow-up actions taken in direct response to identified areas of material risk. These follow-up actions should be read in conjunction with other good practices set out in this report.

2.3.1

Good practice for setting materiality thresholds

Better an egg today than a hen tomorrow – setting materiality thresholds and follow-up actions

Expectation 1

Institutions are expected to understand the impact of climate-related and environmental risks on the business environment in which they operate, in the short, medium and long term, in order to be able to make informed strategic and business decisions.

Expectation 7.2

Institutions are expected to comprehensively include climate-related and environmental risks in their assessment of materiality for all of their business areas in the short, medium and long term under various scenarios.

To form a final judgement on materiality, institutions develop a threshold against which the outcome of the materiality assessment is assessed (see good practice 2.2.1 for an overview of such assessments). These thresholds can be quantitative or qualitative, depending on whether a quantitative assessment of materiality is feasible. Amongst other things, the following threshold types have been observed in the context of C&E risks. Depending on its solvency and liquidity position, the institution sets a maximum threshold for each of the threshold types.

- Capital impact – the level of capital at risk in the normative (e.g. Common Equity Tier 1 ratio) and economic perspective (e.g. economic capital).
- Liquidity impact – the level of net outflows in the normative (e.g. liquidity coverage ratio) and economic perspective.
- Qualitative assessment – the qualitative assessment of the risk event and its expected impact in terms of adverse consequences for the institution's reputation or ability to be compliant.
- Concentrations – the size of the exposure that is affected by the risk event relative to total exposure. Risk concentrations can lead to material impact under relatively mild market conditions.

After the determination of materiality, institutions take a variety of actions to ensure that their risk management framework and processes effectively address these material risks and a strategic approach is adopted to ensure the resilience of their business model. The table below provides a non-exhaustive list of observed practices in this regard.

Table 5

Non-exhaustive list of observed follow-up actions after determination of materiality

Type of action	Description
Risk inventory	Institutions update risk inventory with any newly identified material C&E risk drivers. This includes a mapping of the various C&E risk drivers, their transmission channels and theoretical impact on prudential risk categories.
Sector policies and strategies	The materiality assessment is used to inform sector policies and strategies. For example, by deciding to reduce exposure to certain climate-sensitive activities, client types or sectors and/or increase exposure to climate-resilient ones.
Risk appetite limits	The materiality assessment is used to recalibrate sector limits in the risk appetite statement. For sectors that are sensitive to physical and/or transition risks, the institution deploys haircuts to the institutions' exposure at default sector limits. These haircuts range from 5% to 10% depending on the level of sensitivity.
Stress testing	The materiality assessment is used for a re-assessment of the risk coverage in institution's standardised stress tests as well as may trigger ad-hoc stress test on specific C&E risk drivers.
Capital allocation	Institutions allocate economic capital specifically to the management of material transition and physical risk drivers. In the various cases, economic capital is allocated to either credit, market or operational risk, typically based on the outcome climate-related scenario analyses (e.g. NGFS scenarios, business continuity scenarios). In some cases, institutions have decided to reflect C&E risks as part of the management buffer.

One institution assesses the materiality of the impact of climate change and environmental degradation on its business environment, regularly performing deep dives, including with a specific focus on the impact of policy and regulation for each of the key sectors it is active in. The outcomes are integrated in the business strategy. The business strategy is integrated in the institution's policies and procedures, with regard inter alia to the due diligence of counterparties (e.g. supply chains analysis), the data aggregation processes (e.g. for the energy performance of buildings, the CO2 emissions of vehicles, the carbon footprint calculations for SMEs and corporates) and customer engagement (e.g. requiring realistic phase-out plans from the coal sector). The table below describes observed practices in this regard.

Table 6

Stylised example of institutions' strategic response to material risk by sector

Sector	Identified C&E risks	Strategic response
Energy	- Elevated risk of stranded assets among fossil fuel industries - Strategic risk associated with rapid deployment of renewable energy sources, driven by technological innovation - Rising exposure of clients to extreme weather (e.g. floods)	- Restrictions on lending to fossil fuel industries (e.g. oil and gas), including a phase-out plan from coal - Increasing credit to renewables projects for proven technologies, with a focus on wind, solar, smart grids and charging infrastructure for electric vehicles - Broadening the offer of insurance products against damages caused by extreme weather events
Commercial real estate and mortgages	Elevated transition risk due to comparative inefficiency of buildings (collateral)	- Estimate the carbon footprint of individual customers based on gas and light bills to support targeted increases in credit for building renovation and energy performance measures - Restriction on loans for energy-inefficient buildings (taking into account their energy performance) - Provide support tools for customers to monitor and optimise the energy consumption of homes
Transport	- Elevated transition risk associated with public incentives and increasing market sentiment for electric vehicles - Elevated transition risk associated with carbon pricing of transport, emissions regulation of vehicles and planned prohibition of ICU vehicles	- Engagement with transportation clients relying on broadly inefficient vehicles to develop a tailored business proposition - Developing credit and insurance products tailored to electric vehicles and accessories, such as charging stations, solar panels and home batteries
Agriculture	- Elevated credit risk due to, inter alia, droughts and heat waves reducing crop yields, sea temperature rises affecting fisheries - Elevated transition risk associated with regulation and pricing of air, water and land pollution	- Adopting biodiversity criteria in the credit policy, restricting financing to activities which impact protected areas - Advisory and financial support for sustainable investments, with a focus on more climate-resilient cultivations, new irrigation technologies, geographical diversification, installation of renewable energy technologies

3 Business strategy

This section describes good practices for the integration of C&E risks into institutions' business strategy. The Guide provides detailed expectations to institutions on how to determine which C&E risks impact their business strategy in the short, medium and long term (for example, using scenario analyses) and on how to reflect these risks in their business strategy and its implementation.

While Section 2 described how institutions identify material C&E risks, this section goes a step further to illustrate how institutions have translated the awareness of their exposure to transition risks and physical risks into a strategic approach to managing them (Section 3.1), identifying which strategic steering tools are being used in this regard (Section 3.2). Institutions have so far placed more emphasis on transition risk than on physical risk drivers when integrating climate-related risks into their business strategy. The ECB reiterates its expectation for institutions to also take into account physical risk drivers in this regard.

Table 7
Good practices for business strategy

Section	Topic	Description	Expectation
Strategic approaches	Transition planning	Managing risk via transition planning	2
	Target-setting	Scenario choices for target-setting	2
	Transition products	Transition finance products and services	2
Strategic steering tools	Client engagement	Maintaining and exiting client relationships	2, 7.4
	Client transition plans	Assessing the maturity of client transition plans	2, 7.4

3.1 Strategic approaches

The ECB observed institutions that have taken a strategic approach to managing transition risks. The observed good practices are frequently connected with institutions' so-called net-zero commitments. With these commitments, institutions publicly announce their intention to align their portfolios with the goals of the Paris Agreement. According to the most recent scientific findings, achieving these goals requires reducing greenhouse gas (GHG) emissions to net-zero by 2050 at the latest.

In the observed good practices, transition planning is used as a means to manage institutions' exposures to transition risk. The strategic mindset underpinning such planning efforts allows institutions to better respond to risks over time horizons that exceed the typical business planning timeframe (usually limited to three to five years).

In this sense, institutions: (i) set targets based on up-to-date scientific pathways and an assessment of the materiality of the underlying risks (see Section 2), and (ii)

incorporate the target-setting process and roll-out of corresponding implementing actions into their governance frameworks (see Section 4.1), organisational structure (see Section 4.3), risk appetite framework (see also Section 4.4) and risk management processes (see Section 5). Enhanced data governance and internal risk reporting frameworks support institutions' strategic risk management ambitions (see Section 4.5). Moreover, institutions adjust their product offering on the basis of the foregoing considerations (see Sections 3.2 and 5.3) and align remuneration incentives with their climate-related approach and commitments they have voluntarily made (see Section 4.2).

3.1.1

Good practice for transition planning

Thinking ahead – managing risk via transition planning

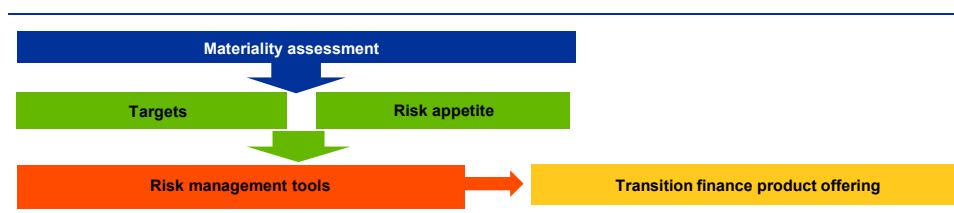
Expectation 2

When determining and implementing their business strategy, institutions are expected to integrate climate-related and environmental risks that impact their business environment in the short, medium or long term.

Institutions use transition planning as a means of managing transition risks. The ECB observed institutions that draw a link between their assessment of material transition risk drivers, strategic targets, risk appetite framework and risk management tools. In addition, they use this integrated framework as an input when rolling out their transition finance product offering.

Figure 1

Stylised example of transition planning risk management cycle



1. Materiality assessment

Before setting targets, institutions typically assess the materiality of their exposure to transition risks. They set targets for areas of material risk exposures.

For instance, an institution might classify sectors according to the materiality of its exposure at default to them. The institution then sets targets for the sectors that it identifies as being most subject to transition risks and that are most relevant for its portfolio exposure. It might go on to set targets for the reduction of financed emissions in these sectors for the near and medium term, such as 2025 and 2030. These targets are set with the aim of achieving the institution's long-term objectives, such as a commitment to reduce financed emissions to net-zero by 2050.

2. Strategic targets and risk appetite

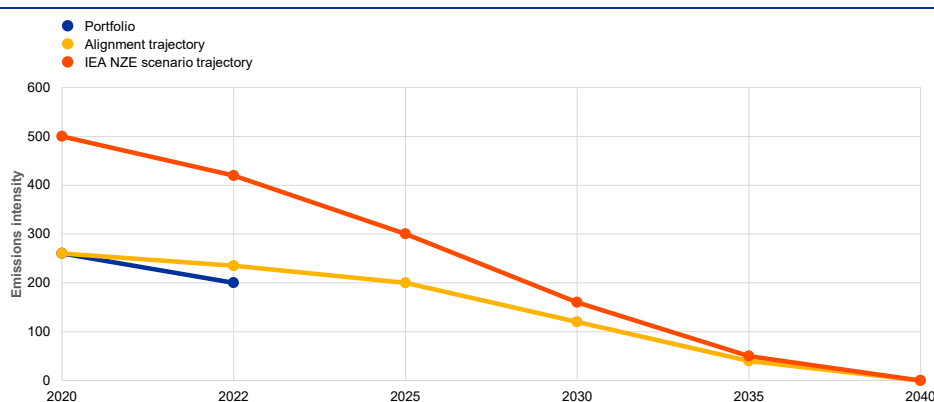
In a next step, institutions bolster their targets via monitoring mechanisms and taking action that has portfolio allocation implications. For instance, one institution has established key performance indicators (KPIs) reflecting its short, medium and long-

term targets and cascaded them down to individual business lines. In addition, institutions typically reflect targets in their key risk indicators (KRIs).

One institution has translated its portfolio alignment metrics and targets into KRIs. Some of these KRIs measure the emissions intensity of the institution's exposures to certain sectors. The KRIs track the alignment of the emissions intensity in the institution's portfolios with the transition trajectory the institution intends to follow. A KRI breach is triggered each time the emissions intensity exceeds the alignment trajectory.

Chart 2

Stylised example of a KRI tracking the alignment of the emissions intensity of exposures with the institution's transition trajectory



Notes: IEA NZE refers to the Net Zero Emission by 2050 (NZE) scenario of the International Energy Agency (IEA) which describes a narrow but achievable pathway for the global energy sector to achieve net zero CO2 emissions by 2050, using technology roadmaps.

Another institution has set intermediate portfolio alignment targets to achieve its longer-term objective of aligning its portfolio with the Paris Agreement and reflected them in its risk appetite framework. For instance, to achieve one of these intermediate targets, the institution's risk appetite framework contains quantitative exposure limits that chart an exposure reduction path to the target date. The limits are complemented by attention thresholds.

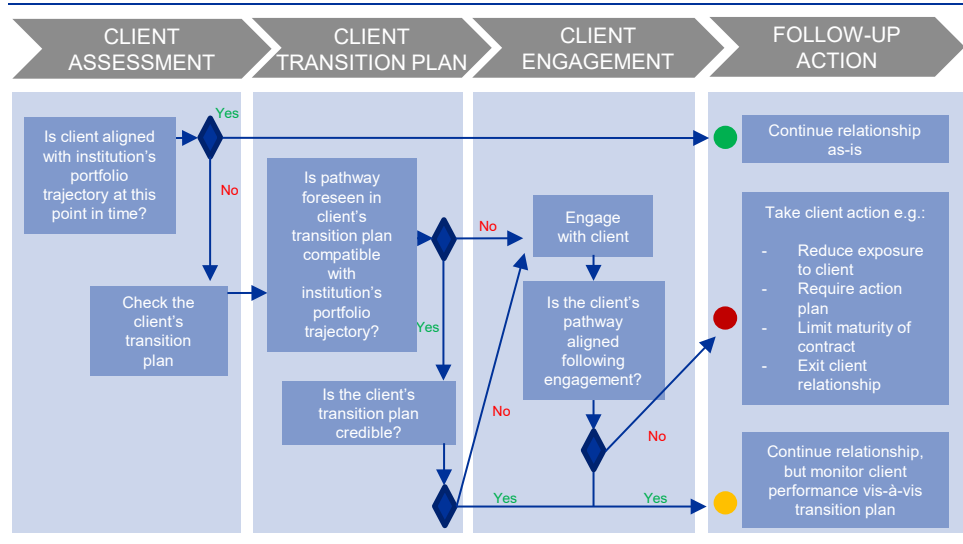
3. Risk management tools

Targets and attention thresholds are integrated into institutions' monitoring and escalation arrangements that require remedial action in the event of breaches. One institution specifically takes counterparty-specific actions for clients that are not aligned with the institution's portfolio trajectory. The institution takes into account the level of advancement of clients' transition plans when determining whether a client is misaligned with its portfolio trajectory.

If a client is misaligned, the institution enters into a dialogue with the relevant client in order to steer it onto a transition path that is in line with its trajectory. If this dialogue is not successful, the institution has procedures in place to outright reduce the exposure to the client or terminate renewable contracts.

Figure 2

Stylised example showing how clients' transition plans are taken into account in assessing their alignment with the institution's portfolio trajectory



4. Product offering

Institutions also adjust the product offering for clients subject to elevated transition risks. For instance, an institution might offer transition finance products to clients in the context of its client engagement discussions. Another institution uses a transition risk scorecard methodology in the due diligence carried out during credit origination for customers active in sectors with elevated transition risks. The result of the assessment is used to offer specific products to customers to support them in the transition.

3.1.2

Good practice for target-setting

Making a difference – scenario choice for target-setting

Expectation 2

When determining and implementing their business strategy, institutions are expected to integrate climate-related and environmental risks that impact their business environment in the short, medium or long term.

Institutions are integrating C&E risks in their strategic target-setting process. As a starting point, they frequently exclude new financing of particularly harmful and therefore potentially risky exposures such as coal mining, thermal coal power generation and companies operating in the oil and gas sector, typically prioritising coal-related activities. Existing exposures in these areas are phased out. The table below illustrates observed practices in this regard (see also Section 5.1).

Table 8**Non-exhaustive examples of observed practices related to exclusions**

Sector	Scenario	Exclusion	Year
Coal	n/a	Full phase-out.	2030
Coal	n/a	Full phase-out. Intermediate milestone: Exclusion of companies with > 5 GW installed capacity (power generation) or > 10% revenue or power generation from coal. Exclusion of companies with new coal projects (exception: credible exit strategy by 2030 and no new coal projects or assets beyond 2030).	2030
Coal	IEA SDS	Full phase-out of coal mining.	2040
Oil and gas	n/a	No more direct financing, insurance or advisory services for exploration and extraction of new oil and gas fields.	n/a
Oil and gas	n/a	Complete phase-out (exception: companies with credible exit strategy by 2040 and no new oil or gas exploration projects or assets beyond 2030).	2030
Power generation	IEA NZE 2050	Phase-out of financial services to power generation customers with > 10% revenues from thermal coal.	2030
Power generation	IEA SDS	Phase-out of thermal coal power generation.	2040
Power generation	n/a	No new energy companies with thermal coal capacity and run-down of all legacy loans when coal-based capacity of mixed energy companies > 25%.	n/a

Institutions that are more advanced in integrating transition risks into their business strategy typically also set short, medium and long-term targets. These targets show how the institution's portfolios have to evolve over time in order to meet the longer-term objectives. Frequently, institutions use targets with the aim of gradually reducing their financed emissions along a chosen scenario pathway.

Targets are usually set based on forward-looking and science-based decarbonisation pathways, at times coupled with third-party validation mechanisms, such as the Science Based Targets initiative (SBTi). Generally, the sectors assessed by institutions as particularly sensitive to transition risk also tend to offer institutions the biggest opportunities in terms of providing transition finance and advisory services.

Institutions frequently apply the methodology developed by the Partnership for Carbon Accounting Financials (PCAF) for measuring financed emissions and the Paris Agreement Capital Transition Assessment (PACTA) methodology for forward-looking measurement of the alignment of portfolios along scenario-based transition pathways. Institutions couple these tools with (stress) scenario analyses to understand whether their envisaged strategic response is sufficiently resilient over longer time horizons in the face of the uncertainty surrounding climate-related risks.

Institutions have also laid the groundwork for integrating physical risks into their business strategies. For instance, one institution found synergies in the parallel management of transition and physical risks at client level, which could also be leveraged via its sustainable financing products.

The importance of scenario choice for target-setting

When institutions set alignment targets, they rely on transition scenarios that describe the decarbonisation trajectory of economic sectors over a certain period of time, mostly up to 2050 or beyond. Scenario choice has important consequences as

transition scenarios differ significantly from one another. One of the key determinants is the level of ambition of emissions reductions required by the scenario for each sector.

The Paris Agreement provides that global warming is halted at well below 2°C above pre-industrial levels, and that efforts are made to limit global warming at 1.5°C. Accordingly, scenarios that describe the “well below 2°C” commitment, such as the International Energy Agency’s (IEA) Sustainable Development Scenario (SDS), assume a greater remaining carbon budget and conversely require less severe emission reduction efforts than 1.5°C scenarios, such as the IEA’s Net Zero Emissions (NZE) by 2050 scenario.

The ECB observes a considerable degree of variation among intermediate targets set for different sectors by institutions thus far. For instance, in the power generation sector, one institution’s target for 2025 calls for an emissions intensity level of 0.18 t CO₂e/MWh, whereas another institution’s target calls for a level of 212 g CO₂e/kWh (see the table below).

Table 9
Non-exhaustive list of observed metrics and targets

Sector	Metric	Metric type	Reference scenario	Targets	Target year (intermediate)	Target year (long-term)
Automotive	g CO ₂ /km	Physical intensity	n/a	81 g CO ₂ /km	2025	2050
				58 g CO ₂ /km	2030	
	g CO ₂ /km	Physical intensity	IEA NZE 2050	118 g CO ₂ /km	2030	
	g CO ₂ /vkm	Physical intensity	EU Regulation	70 g CO ₂ /vkm by 2025	2025	
	kg CO ₂ /km	Physical intensity	IEA NZE 2050	~0.1 kg CO ₂ /km	2030	2050
				~0 kg CO ₂ /km		
Aviation	g CO ₂ /passenger km	Physical intensity	IEA NZE 2050	~60 g CO ₂ /passenger km	2030	2050
				~12 g CO ₂ /passenger km		
Cement	kg CO ₂ /t cement	Physical intensity	IEA NZE 2050	575 kg CO ₂ /t cement	2030	2050
	t CO ₂ /t cement	Physical intensity	ISF-NZ	~0.5 t CO ₂ /t cement	2030	
				~0.25 tCO ₂ /t cement		
Commercial real estate	GHG emissions/m ²	Volume trajectory	n/a	Reduce CRE portfolio GHG emissions by 36% per m ² (2020 baseline)	2030	2050
	kg CO ₂ /m ²	Physical intensity	B2DS Global	Weighted average energy label “C”	2025	
				Weighted average energy label “A”	2030	
	kg CO ₂ /m ²	Physical intensity	Deltaplan DGBC	~0.35 kg CO ₂ /m ²	2030	
				0 kg CO ₂ /m ²		2050

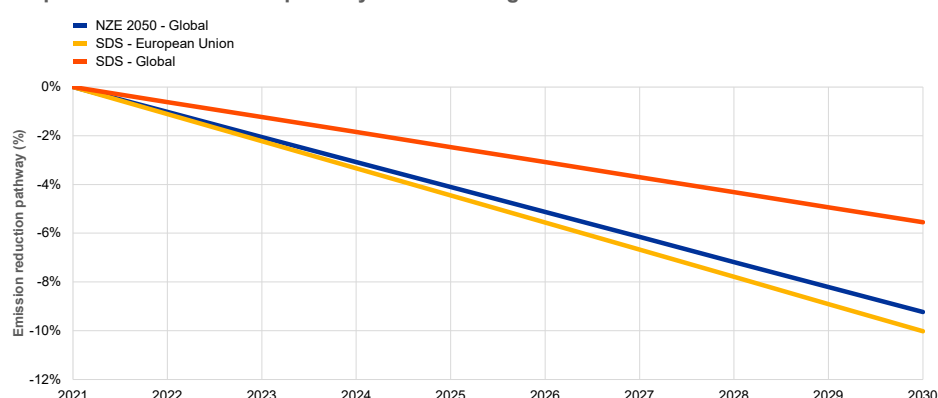
Sector	Metric	Metric type	Reference scenario	Targets	Target year (intermediate)	Target year (long-term)
Oil and gas	USD billions financed	Outstanding amount	IEA SDS	Reduction from USD 9.2 billion to USD 8.2 billion (2020 base year)	2025	2050
	EUR millions financed	Outstanding amount	IEA NZE 2050	-12% outstanding amount (2019 base year)	2025	
				-19% outstanding amount	2030	
				-69% outstanding amount		
Power generation	Percentage of renewable energy generation	Volume trajectory	n/a	65% share of renewable energy generation in the portfolio	2030	2040
	kg CO2e/MWh	Physical intensity	IEA NZE 2050	120 kg CO2e/MWh	2030	
	t CO2e/MWh	Physical intensity	IEA NZE 2050	0.18 t CO2e/MWh	2025	
				0.11 t CO2e/MWh	2030	
	g CO2e/kWh	Physical intensity	IEA SDS	212 g CO2e/kWh	2025	
				67 g CO2e/kWh		
	Percentage of renewable energy generation	Technology mix	IEA SDS	45% share of renewable energy in the portfolio	2024	2040
	kg CO2e/MWh	Physical intensity	IEA NZE 2050	~160 kg CO2/MWh	2030	
				0 kg CO2/MWh		
Residential real estate	GHG emissions/m²	Volume trajectory	n/a	46% GHG emissions reduction per m2 (2020 baseline)	2030	2050
	Energy Performance Certificate (EPC)	Standards based (taxonomy aligned)	B2DS Global	Weighted average EPC label "A"	2030	
	kg CO2/m2	Physical intensity	IEA NZE 2050	~20 kg CO2/m2	2030	
				~0 kg CO2/m2		
Shipping	Poseidon Principles	Alignment score	Poseidon Principles	Alignment difference of 0%	2030	2050
				Alignment difference of 0%		
Steel	kg CO2/t steel	Physical intensity	IEA NZE 2050	515 kg CO2/t of steel	2030	2050
	t CO2/t steel	Alignment score	IEA NZE 2050	Alignment score (Sustainable Steel Principles) of 0	2030	
				Alignment score of 0		
Various/all	t CO2e/MEUR	Carbon intensity	n/a	-43%	2030	2050
				Net zero		
	t CO2e	Absolute emissions	n/a	-43%	2030	
				Net zero		
	°C	Implied temperature score	n/a	2.3°C (scope 1 and 2 portfolio temperature); 2.1°C (scope 1, 2 and 3 portfolio temperature)	2025	

To a large extent, the level of ambition of the emissions reduction required by a given target date depends on the chosen transition scenario. Some transition scenarios also offer regional specifications that may differ significantly from the corresponding global scenario, thereby impacting the level of ambition of the emissions reduction required to meet targets (see the following charts).

Chart 3

Stylised example of emissions reduction pathways for coal-fired power plants under the IEA SDS and IEA NZE 2050 scenarios (including EU regional specification under the IEA SDS scenario)

The graph shows that the International Energy Agency's SDS scenario for the EU has a steeper emission reduction pathway than its NZE global scenario



The required emissions reduction effort for an institution to reach its targets also depends on the starting point of its portfolios at the base year. Institutions with a lower level of financed emissions at the base year have to reduce them by less to reach a given target (see the following table for a comparison of commonly used scenarios for target-setting by sector and the different levels of ambition needed in terms of relative financed emissions reduction versus the institution's chosen base year).

Table 10

Non-exhaustive examples of commonly observed scenario choices by institutions and resulting levels of relative financed emissions reduction versus the base year

Sector	Automotive			Cement			Power			Steel		
Scenario	B2DS	IEA NZE	IEA SDS	B2DS	IEA NZE	IEA NZE	IEA NZE	IEA NZE	IEA SDS	IEA SDS	B2DS	IEA NZE
Δ emissions base year to 2030 target (%)	-24.31	-46.36	-39.47	-21.31	-17.27	-51.81	-26.74	-50.45	-50.82	-35.32	-38.89	-22.56

Institutions demonstrate awareness of the importance and consequences of their scenario choice for target-setting. For example, when setting its own targets, one institution with a net-zero commitment analysed the scenarios most commonly used by peers. It found that not all of them are compatible with a net-zero commitment.

Consequently, the institution opted for a scenario that it believes to be more ambitious and in line with a net-zero trajectory. For similar reasons, another institution with a net-zero commitment discontinued the scenario it had previously been using and moved to one that it deems to be in line with its net-zero objective.

Institutions that make net-zero claims but do not use scenarios that reflect their objectives may expose themselves to risks. For instance, they might face: (i) strategic risks by not meeting their intended objectives, (ii) transition risks by not properly identifying the risks they are exposed to and (iii) potential reputational, litigation and liability risks owing to a possible mismatch between their publicly announced commitments and actual level of ambition.

3.1.3

Good practice for transition products

Finance in transition – transition finance products and services

Expectation 2

When determining and implementing their business strategy, institutions are expected to integrate climate-related and environmental risks that impact their business environment in the short, medium or long term.

To implement their strategic approaches to managing transition risk, institutions have developed a variety of products and advisory services to support their clients in the transition to a low-carbon economy. Institutions frequently offer such products when engaging with their clients.

While the focus is predominantly on corporates, institutions have also developed products and services for their retail clients, in particular in the area of energy efficiency and real estate. Institutions extend their product offering beyond clients to companies in their clients' value chain. Such products might, for instance, be aimed at addressing sustainability challenges in the value chain of an institution's clients. The tables below describe observed transition planning advisory services and products.

Table 11

Non-exhaustive list of observed transition planning advisory services

Description of advisory service	Main aspects	Addressees of advisory service
Structured client dialogue	Institutions enter into a structured dialogue with their corporate clients with the aim of supporting them in their transition. Institutions provide expert advice to clients on their transition, including by benchmarking them vis-à-vis their peers, and offer dedicated products. In this context, institutions also carry out their climate-related risk due diligence assessments and collect client or asset-level data.	Corporates, including SMEs
Commercial and residential real estate energy efficiency advice	Institutions inform clients about options available to them to increase the energy efficiency of their commercial real estate and offer financial products to this end. Such options might relate to alternative goods to reduce electricity consumption. Institutions also offer clients information on energy efficiency legislation. For retail clients, institutions have put in place online platforms that inform clients of concrete options they could take to increase the energy efficiency of their housing, for example by retrofitting it. Institutions also offer in-depth advice via dedicated sustainability-trained client-facing staff.	Corporates and retail
Green mobility	Institutions provide information to their clients on the potential energy savings by renewing their car fleet (for corporate and SME clients) or switching to a more efficient personal vehicle (for retail clients). Institutions also offer leasing products for alternative mobility arrangements for clients' employees (e.g. bicycles).	Corporates, SMEs and retail

Table 12

Non-exhaustive list of observed transition planning products

Description of product	Main aspects	Corporate/retail
Green bonds and sustainability-linked bonds	Some institutions apply the International Capital Market Association Green Bond and Sustainability-Linked Bond Principles. Green Bonds: The proceeds are used solely "to finance or re-finance, in part or in full, new and/or existing eligible Green Projects and which are aligned with the four core components of the Green Bonds Principles". Eligible Green Projects relate, among others, to renewable energy, energy efficiency, pollution, biodiversity, clean transportation and climate change adaptation.* Sustainability-Linked Bonds: The financial and/or structural characteristics of the instrument change if the issuer meets predefined sustainability objectives within a set timeline.**	Corporate
Green loans and sustainability-linked loans	Some institutions apply the Loan Market Association's Green Loan and Sustainability-Linked Loan Principles. Green loans: "any type of loan instrument made available exclusively to finance or re-finance, in whole or in part, new and/or existing eligible projects." The Loan Market Association foresees several components that such loans have to comply with. Among others, the loan proceeds have to be used for eligible projects only (e.g. renewable energy, zero emission vehicles, heat networks, new buildings, building renovations, biodiversity conservation, waste management, water treatment and climate change adaptation).*** Sustainability-linked loans: "any type of loan instruments and/or contingent facilities (such as bond lines, guarantee lines or letters of credit) which incentivise the borrower to achieve ambitious, predetermined sustainability performance objectives."**** Other institutions apply a similar concept through instruments to incentivise the borrower to improve its external environmental, social and governance (ESG) rating. Part of the profit margin on the loans might be donated to sustainable or charity projects.	Corporate
Sustainability-linked supply chain loans	These instruments are not targeted at the institution's own clients, but at the suppliers in the client's value chain. The institution cooperates with its clients to offer favourable financing conditions to the client's suppliers, provided the latter improve their businesses in terms of environmental impact. Performance is monitored.	Corporate
House renovation loans	Special-purpose loans for energy efficient house renovations, sometimes supported by a government scheme. Example: Clients buy real estate with a low-scoring EPC label. They use a loan to increase the EPC label within a certain time period. One institution reduces the interest rate applied to mortgages over the course of its duration if the borrower upgrades the unit to an energy efficient EPC label prior to the interest rate reset date.	Retail
Green mortgages	Loans for the acquisition of real estate with elevated energy efficiency standards, or elevated sustainability standards more broadly (e.g. using recycled building materials or limiting the consumption of fresh water). Institutions often apply preferential mortgage terms and interest rates, at times also due to government support schemes.	Corporate and retail
Investment advice	One institution verifies the extent to which the assets that its private clients invest in contribute to achieving climate goals in order to stimulate portfolio choices aligned with the Paris Agreement.	Private banking

Notes: * International Capital Market Association, "Green Bond Principles: Voluntary Process Guidelines for Issuing Green Bonds", June 2021. ** International Capital Market Association, "Sustainability-Linked Bond Principles: Voluntary Process Guidelines", June 2020. *** Loan Market Association, "Green Loan Principles: Supporting environmentally sustainable economic activity", December 2018. **** Loan Market Association, "Sustainability-Linked Loan Principles: Supporting environmentally and socially sustainable economic activity", March 2022.

3.2 Strategic steering tools

Institutions use client engagement as a steering tool to implement their strategic approaches to managing transition risk. They enter into a structured dialogue with clients subject to elevated transition risks to steer them towards a trajectory that is aligned with the institution's envisaged portfolio pathways. To this end, institutions take clients' transition plans into account.

Where clients do not yet meet the institution's requirements, the continuation of the client relationship is subject to the client taking remedial action. For instance, institutions and the relevant clients might draw up an action plan that is regularly monitored. In this context, institutions also offer specific products to support the client in transforming its business model.

The previous section outlines how client engagement fits into institutions' strategic approaches to managing transition risk. This section provides a more in-depth view of structured client engagement processes and assessment of clients' transition plans.

3.2.1

Good practice for client engagement

Walking a tightrope – maintaining and exiting client relationships

Expectation 2

When determining and implementing their business strategy, institutions are expected to integrate climate-related and environmental risks that impact their business environment in the short, medium or long term.

Expectation 7.4

Institutions are expected to adopt a strategic approach to managing and/or mitigating climate-related and environmental risks in line with their business strategy and risk appetite, and to adapt policies, procedures, risk limits and risk controls accordingly.

Institutions enter into a structured dialogue with clients that they find to be subject to elevated transition risks and that may be misaligned with the institution's targeted portfolio trajectory. This dialogue is embedded in institutions' client due diligence process.

Institutions do not automatically divest from – but rather engage with – clients that may not yet fully meet their requirements. Such engagement is subject to the condition that the client is willing and able to align itself with the institution's requirements within a given timeframe. Depending on the level of risk associated with the observed misalignment, the institution may, for instance:

- reduce limits or exposure to the client;
- reduce the loan tenor;
- adjust client ratings following its rating system;
- ask clients to implement time-bound action plans;
- exit the client relationship.

In one institution, the decision to actually engage with a client follows a pre-established process that is embedded in the institutions' sustainability governance framework. Following a climate-related risk assessment by the first line of defence and an opinion by the second line of defence, a dedicated committee decides whether client engagement can commence. The committee comprises members of the institution's management body and several business areas, including the first and second lines of defence. The committee monitors progress made on client engagement actions on a quarterly basis. Abandoning the client relationship is established as a possible outcome of the process. The steps involved and the outcome of the client engagement process are shown in the following table.

Table 13**Overview of the client engagement process**

Actions and deliverable	Responsible unit/body	Description
1. Engagement starts	Dedicated committee	A dedicated committee decides whether engagement with the client can commence, considering the views of the first and second lines of defence. This decision is based on an assessment of whether the client is willing and able to meet the institution's requirements.
2. Engagement objectives	First line of defence, in consultation with the second line of defence	Following the decision to engage with a client, engagement objectives and a deadline are set. After meeting the objectives, the client has to be aligned with the institution's requirements. The deadline has to be set in the near-term and cannot exceed a predefined amount of time.
3. Client information	First line of defence, in consultation with the second line of defence	The client is informed of the above. In addition, the client is informed of the repercussions of not meeting the engagement objectives and the ensuing decision of being considered misaligned with the institution's requirements.
4. Client action plan	First line of defence, after consulting the second line of defence and the client	Detailed and verifiable actions are drawn up.
5. Quarterly updates	First line of defence, second line of defence and dedicated committee	The first line of defence monitors whether the client is progressing according to the client action plan. An opinion by the second line is required. The dedicated committee is informed, discusses and approves the progress update.
6. Assessment	First line of defence, second line of defence and dedicated committee	At the end of the engagement period, the first line of defence assesses the client's performance vis-à-vis the engagement objectives and whether it is now aligned with the institution's requirements. An opinion by the second line of defence is required. The dedicated committee is informed and decides whether the client engagement process can be closed.

3.2.2**Good practice for client transition plans****Making progress – assessing the maturity of client transition plans****Expectation 2**

When determining and implementing their business strategy, institutions are expected to integrate climate-related and environmental risks that impact their business environment in the short, medium or long term.

Expectation 7.4

Institutions are expected to adopt a strategic approach to managing and/or mitigating climate-related and environmental risks in line with their business strategy and risk appetite, and to adapt policies, procedures, risk limits and risk controls accordingly.

An institution enters into a structured dialogue with large GHG emitting clients to assess whether the relationship can be continued and to support them in establishing or strengthening their transition plans. To this end, the institution groups these clients based on the level of maturity of their transition plans (e.g. advanced, intermediate, starting phase or no publicly disclosed plans). To this end, it has a methodology in place focusing on three elements that, in the institution's view, are key for a robust transition plan, namely governance, actions to implement the transition plan, and targets and disclosures. The methodology is transparently documented. The institution observes that clients are making progress, as many have announced their intention to set Paris-aligned or science-based targets. However, it also finds that more substantive progress is needed in terms of meeting the targets and improving transition plans more broadly.

Table 14**Stylised and simplified assessment of client transition plans**

	Client A	Client B	Client C
Assessment	Advanced	Intermediate	Starting phase
Targets	In place	In place	In place
Disclosure	In place	In place	In progress
Detailed assessment of client transition plan	Climate risk: Viewed as material by the client	Climate risk: Acknowledged by the client	Climate risk: Acknowledged by the client
	Governance: Strong	Governance: Sustainability committee in place	Governance: Risk committee assigned responsibility for sustainability; chair and CEO steer climate strategy
	Plans and actions: Aligned	Plans and actions: Under development	Plans and actions: Limited
	Targets: Net zero emissions by 2050	Targets: Voluntarily made public commitment for net zero; 2030 emissions reductions targets	Targets: Across some of its operations
	Reporting: TCFD, fully aligned	Reporting: TCFD, not fully aligned	Reporting: Not TCFD-aligned

4 Governance and risk appetite

This section describes good practices related to institutions' governance and risk appetite frameworks as well as associated data governance and internal risk reporting processes for managing climate-related risks. The ECB's Guide sets out supervisory expectations on: (i) the roles, responsibilities and collective suitability of the management body as regards C&E risks, (ii) institutions' integration of these risks into their risk appetite frameworks, including their remuneration policies and practices, (iii) assigning responsibility for the management of C&E risks within the organisational structure in accordance with the three lines of defence model, and (iv) reporting aggregated risk data reflecting institutions' exposures to C&E risks with a view to enabling the management body and relevant sub-committees to make informed decisions.

The previous section outlined good practices of institutions related to the strategic approaches and steering tools they use to manage climate-related risks. This section focuses on how institutions have embedded their climate-related risk management strategies and processes into their organisational set-up. Sections 4.1, 4.3 and 4.4 describe how institutions that manage transition risk with a strategic approach incorporate the target-setting process and roll-out of corresponding implementing actions into their governance frameworks, organisational structure and risk appetite framework. They support their strategic and risk-related decisions with enhanced data governance and internal risk reporting frameworks (Section 4.5) and offer incentives in their remuneration policies that are consistent with their climate-related approach and commitments they have voluntarily made (Section 4.2).

Table 15
Good practices in governance and risk appetite

Section	Topic	Description	Expectation
Management body	Management body	Steering on business strategy and net-zero commitments	3, 5.2
Remuneration	Remuneration policies	Aligning remuneration policies with climate-related objectives	4.3
Organisational structure	Second line of defence	Climate-related risks and the second line of defence	5.4, 5.5
	Third line of defence	Embedding C&E risks into internal audit reviews	5.6
Risk appetite	Key risk indicators	Pointing forward with key risk indicators	4
Reporting	Data governance	Governance, processes and collection of C&E-related risk data	6.1, 6.2, 6.4
	Internal risk reporting	Internal reporting on climate-related risks	6.3

4.1 Management body

Institutions have allocated responsibilities within the management body and/or sub-committees for climate-related risks. Frequently, they establish dedicated committees to assist the management body in designing and implementing the institution's climate-related risk management strategy and risk management

framework. These committees also provide advice on voluntarily making and implementing commitments.

Institutions have set up governance arrangements that allow for top-down and bottom-up discussions involving all relevant functions. This allows them to obtain business-line input and support for strategic decisions and subsequent implementation. Before voluntarily making commitments, institutions expressly consider the human and financial resources needed to implement the commitment and make adjustments accordingly.

4.1.1

Good practice for governance frameworks

Leading the way – steering on business strategy and net-zero commitments

Expectation 3

The management body is expected to consider climate-related and environmental risks when developing the institution's overall business strategy, business objectives and risk management framework and to exercise effective oversight of climate-related and environmental risks.

Expectation 5.2

Institutions are expected to ensure that the functions involved in managing climate-related and environmental risks have the appropriate human and financial resources.

Institutions are integrating C&E risks in the organisational set-up of the management body. For example, in one institution the management body approves the institutions' environmental strategy and risk management framework along with the corresponding policies, and oversees their implementation. In the discharge of its duties, it has to take into account the commitments voluntarily made by the institution, such as its net-zero pledge. The CEO is responsible for embedding the institution's environmental policy into its day-to-day operations and processes.

A dedicated committee advises the management body on environmental matters. According to the institution's policies, the members of the committee must have an appropriate level of knowledge and experience in this area. In addition, the majority of its members have to qualify as independent directors. Meetings are held at least on a quarterly basis. The committee's tasks are directly linked to the oversight function of the management body vis-à-vis the institution's environmental strategy and risk management framework. It provides advice on:

- the need to make changes to the environmental strategy and implementing policies;
- the institution's net-zero commitments;
- the appropriateness of the institution's risk appetite framework in view of its environmental strategy;
- the adequacy of its risk management processes with respect to C&E risks.

Other institutions have set up committees to deal with more technical aspects, such as green bond committees. For instance, one institution issues green bonds using the Green Bond Principles developed by the International Capital Markets Association.³ The institution has set up a dedicated green bond committee that verifies compliance with these principles and the institution's corresponding internal policy. For instance, it checks whether a given transaction is aligned with the

³ International Capital Markets Association, "Green Bond Principles: Voluntary Process Guidelines for Issuing Green Bonds", June 2021.

institution's green bond policy and oversees the allocation of the proceeds in accordance with the policy. The committee draws its members from various business areas and levels of hierarchy. It meets at least on a quarterly basis.

Top-down and bottom-up integration

One institution's governance structure also foresees arrangements that allow for top-down and bottom-up discussions involving all relevant functions, including the business lines operating in the main geographies in which the institution is present. To this end, a collective decision-making body has been established which:

- discusses the institution's strategy related to its net-zero commitments and prepares decisions in this regard that are then discussed by the institution's dedicated sustainability committee. This way, strategic discussions on environmental matters and, in particular, on commitments are fed with views from the ground up;
- verifies the extent to which the institution's environmental strategy is integrated into its daily operations. To this end, it prepares proposals on changes, for instance, to credit policies as well as products and services. This means that the institution's environmental strategy trickles down via the relevant functions.

Financial and human resources

When evaluating the appropriateness of their human and financial resources for managing C&E-related risks, institutions consider their strategy, risk management framework, commitments and regulatory developments. Where gaps are identified, the institutions allocate budget and increase staffing accordingly.

For instance, prior to publicly announcing a net-zero commitment, one institution considered the human and financial resources needed to implement that commitment. Another institution allocates dedicated financial resources to C&E-related needs arising from its strategy and commitments as well as from its risk management objectives and regulatory developments. The budget relating to the institution's C&E-related strategy and commitments encompasses a variety of projects (for instance, the institution's continued refinement of its client engagement strategy and work on broader environmental risks, such as biodiversity loss). This budget is subject to regular monitoring.

Knowledge and experience

Institutions provide specific training to the members of the management body on C&E risks. Observed topics of such trainings cover, for example, the meaning of net-zero emissions for financial institutions and technical aspects such as portfolio alignment methodologies. Moreover, some institutions see knowledge and experience on C&E risks as a prerequisite for members of the management body, particularly those assigned to dedicated committees.

4.2 Remuneration

Institutions have integrated climate-related KPIs into their remuneration policies. At the current juncture, this is generally the case for the remuneration policies applying to members of the management body and senior managers only. In some cases, these KPIs are directly linked to commitments voluntarily made by institutions, particularly net-zero emissions pledges, and the institution's strategic risk management approach. Institutions have also started to adjust the remuneration policies applying to all staff, for instance by including environmental targets in their variable remuneration component.

4.2.1 Good practice for remuneration policies

Net zero, not zero incentives – aligning remuneration policies with climate-related objectives

Expectation 4.3

Institutions are expected to ensure that their remuneration policy and practices stimulate behaviour consistent with their climate-related and environmental (risk) approach, as well as with voluntarily commitments made by the institution.

Institutions are integrating C&E risks into the variable remuneration components for members of the management body and senior managers and base these variable remuneration components on KPIs that track whether predefined targets have been met. Often, the KPIs span several financial years. Pay-out is deferred until after the reference period.

Institutions align such multi-year KPIs with the implementation of their commitments and their strategic approach to managing climate-related risks. Remuneration policies might, for instance, provide incentives to meet the institution's targets for reducing the emissions intensity of its exposures to sectors subject to transition risk. The following table outlines examples of observed KPIs.

Table 16

Non-exhaustive list of observed climate-related remuneration KPIs

Type of climate-related remuneration KPI	Description	Annual or multi-annual
Financed emissions reduction targets	Emissions intensity reduction targets are met at portfolio level.	Multi-annual
Product targets	A set amount of "sustainable" or "green" finance products has been issued.	Annual and multi-annual
Target-setting	A variable remuneration incentive is triggered based on the number of science-based targets set by the institution.	Multi-annual
Policy targets	The institution meets predefined milestones as per its C&E-related risk management strategy (e.g. adopting certain policies within the institution).	Annual and multi-annual
Rating targets	The institution achieves a predetermined level of sustainability ratings from a set pool of rating agencies.	Annual

One institution has several climate-related KPIs in place that provide incentives for the implementation of its net-zero commitment and achievement of its strategic risk management approach. Incentives are not binary (i.e. target met or not met), but instead apply at different levels depending on whether:

- targets are not met: the variable remuneration component does not apply;

- targets are met: the variable remuneration applies at a minimum level;
- targets are exceeded: the variable remuneration component applies beyond the minimum level in proportion to the level of excess performance and up to a maximum factor.

The variable remuneration is paid out based on the weighted average of the incentive levels achieved for each KPI at the end of the reference period. The payout is distributed equally over a set number of years from the end of the reference period.

Table 17
Stylised example of KPIs and related incentive levels

Climate-related net-zero KPI	Additional notes	Incentive level	Description
Amount of "green" finance issued	Overall target set for the following X amount of years	Target is not met	0% of variable remuneration component
		Target is met	100% of variable remuneration component at minimum level
		Target is exceeded	Up to 1XX% of variable remuneration component at minimum level, proportional to target excess
Percentage of emissions intensity reduction in portfolio	Overall reduction target set for 20XX versus baseline year 20YY (in line with the institution's transition trajectory)	Target is not met	0% of variable remuneration component
		Target is met	100% of variable remuneration component at minimum level
		Target is exceeded	Up to 1XX% of variable remuneration component at minimum level, proportional to target excess

4.3 Organisational structure

Institutions have made significant progress on integrating C&E risk practices across all layers of the organisation. In the first and second lines of defence, responsibilities and roles are allocated for the management of C&E risks. The risk management function is, for example, involved with all higher-risk transactions and has the power to veto these transactions. The compliance function is responsible for a wide range of activities, including carrying out checks on the institution's product offering. Tasks and responsibilities in the second line of defence also encompass mitigation of the risks associated with greenwashing.

Internal audit reviews cover a wide range of topics. These include the institution's climate-related strategy, governance and risk management policies, as well as its readiness to voluntarily make commitments and subsequent compliance therewith. This section describes observed good practices related to the organisational structure of institutions.

4.3.1

Good practice for the second line of defence

Second in name only – climate-related risks and the second line of defence

Expectation 5.4

Institutions are expected to define the tasks and responsibilities of the risk management function for identifying, assessing, measuring, monitoring and reporting climate-related and environmental risks.

Expectation 5.5

Institutions are expected to define the tasks and responsibilities of the compliance function by ensuring that compliance risks stemming from climate-related and environmental risks are duly considered and effectively integrated in all relevant processes.

Institutions have defined the tasks and responsibilities of the risk management function for identifying, assessing, measuring, monitoring and reporting C&E risks. These tasks cover a wide range of activities, such as providing expert opinions on client transactions and developing institutions' risk management policies. Other examples of observed tasks include the development and roll-out of institutions' methodologies for portfolio alignment assessments (e.g. using PACTA) and measuring financed emissions (e.g. using PCAF).

The compliance function is typically tasked with ensuring compliance with climate-related laws, rules, regulations and standards, including in relation to products offered by the institution. Against the backdrop of regulatory developments and commitments it has voluntarily made, one institution found, for example, that there is an increasing need to mitigate the risk of greenwashing. The institution adopts a quantitative approach to assessing the possible consequences of this risk. Following this assessment, follow-up actions are defined, which relate, among other things, to staff knowledge and expertise, data and methodologies, governance and internal control frameworks.

The institution has included a definition of greenwashing risk in its risk taxonomy, identified possible sources of that risk and defined roles and responsibilities within its organisational structure for its mitigation. In particular, for the second line of defence, the institution has included greenwashing risk considerations into the governance framework for its products and services. In addition, dedicated compliance checks are carried out.

The table below provides non-exhaustive and high-level examples of the tasks and responsibilities assigned to the risk management and compliance functions related to the management of climate-related risks.

Table 18

Non-exhaustive list of examples of tasks carried out by the risk management and compliance functions

Function	Type of task	Description
Risk management function	Expert opinion on client transactions	Analyses and provides expert judgement on exposures to clients from high-risk industries.
	Recommendations for risk mitigation	Makes recommendations for risk-mitigating actions for transactions assessed as high-risk.
	Veto right	Can veto transactions assessed as high-risk.
	Methodology development: Risk management policies	Prepares and maintains the institution's climate-related risk management policies (e.g. exclusion policies).
	Methodology development: Portfolio alignment	Develops and rolls out the institution's methodology for portfolio alignment assessments (e.g. using PACTA).
	Methodology development: Financed emissions	Develops and rolls out the institution's methodology for measuring financed emissions (e.g. using PCAF).
	Methodology development: Client questionnaires	Develops and rolls out the institution's climate-related client questionnaires for due diligence and data collection purposes.
Compliance function	Monitoring developments	Monitors legislative and regulatory requirements concerning climate-related risks. Recommends changes to the institution's policies and coordinates the implementation of such changes.
	Compliance risk assessment	Performs compliance risk assessments taking into account climate-related laws, rules, regulations and standards. Prepares and recommends follow-up actions. Reports the outcome of these assessments to the management body and/or its committees, including as regards residual risk.
	Advice on climate-related strategy	Provides advice on the institution's climate-related strategy. The compliance function is represented in dedicated committees, where established.
	Advice and checks on product offering	Provides advice and checks on the institution's climate-related product offering, such as "green" products.

4.3.2

Good practice for the third line of defence

No escape – embedding C&E risks into internal audit reviews

Expectation 5.6

The internal audit function is expected to consider in its reviews the extent to which the institution is equipped to manage climate-related and environmental risks.

Institutions have assigned roles and responsibilities of the internal audit function for C&E-related risks and included these risks in the multi-year audit plans approved by the audit committee. The table below provides a non-exhaustive list of examples of past and planned internal audit reviews concerning C&E-related risks.

Table 19**Non-exhaustive list of past and planned C&E-related internal audit reviews**

Topic	Description of internal audit review
Materiality assessment	Assessment of the consideration of C&E risks in the institution's materiality assessment.
Strategy	Review of the integration of C&E risks in the institution's business strategy, including at subsidiary and local level. Review of the controls established for actions aimed at achieving the institution's climate-related targets. Review of the framework for calculating C&E-related KPIs.
Commitments	Assessment of the institution's readiness to implement commitments it intends to make voluntarily. Review of the institution's compliance with commitments.
Governance	Assessment of the performance of the governance structure as regards exercising effective oversight vis-à-vis the institution's management of C&E risks.
Organisational structure	Assessment of the performance of the organisational structure at subsidiary and local level as regards managing C&E risks.
Third-party data providers	Review of the institution's procurement policy to acquire C&E data from third-party providers, including in terms of understanding the methodologies and assumptions used by providers.
Regulatory framework	Alignment of the institution's policies and processes with the regulatory framework for C&E risks.
C&E-related policies	Review of the institution's C&E-related policies. Assessment of the level of compliance with the institution's C&E-related policies. Review of the consideration of C&E risks in transaction due diligence. Assessment of the institution's compliance with the Equator principles that it has signed up to.
C&E-related credit risk	Review of the degree of effectiveness of the C&E-related credit risk assessment process and the transparency of the underlying methodology. Review of the assessment of C&E risks in the real estate portfolio. Analysis of the impact of C&E risks on the institution's internal ratings models. Assessment of the level of the institution's compliance with its climate-related loan origination policies, including related monitoring arrangements.
Product offering	Review of the institution's sustainable finance products and services, and of related internal policies. Review of the governance and internal control frameworks for the categorisation of loans as "green". Analysis of the impact of C&E risks on the institution's product development process. Review of the level of compliance of sustainable investment product policies and processes with regulatory requirements, including the related prevention of greenwashing.
Stress testing	Review of the institution's framework for climate risk stress testing.
Disclosures	Review of the institution's sustainability disclosures to assess compliance with regulatory requirements and the underlying methodologies adopted by the institution.

4.4 Risk appetite

Institutions have included granular and forward-looking climate-related KRIs in their risk appetite framework (RAF). Institutions have also improved the level of transparency about the methodology underlying their KRIs. The recipients of internal reports are, for instance, informed of the limitations of existing indicators.

Clear escalation arrangements are defined when limits are breached. For the most part, institutions do so by embedding climate-related KRIs in the institution's regular monitoring processes. Institutions increasingly deploy quantitative KRIs, for instance in the form of exposure limits for different sectors and geographies. This can be an

intermediate step bearing in mind that the ECB expects the RAF to be forward-looking.

4.4.1

Good practice for risk appetite

Losing appetite – pointing forward with key risk indicators

Expectation 4

Institutions are expected to explicitly include climate-related and environmental risks in their risk appetite framework.

Institutions have started to develop granular and forward-looking KRIs. For instance, one institution established KRIs based on the alignment of its portfolios with a chosen transition trajectory. The KRIs track on an ongoing basis whether the institution's exposures are misaligned with the transition trajectory portrayed by the scenario the institution has used. Another institution has established indicators based on the financed emissions in its portfolios.

Beyond quantitative KRIs, institutions have also established KRIs that monitor the roll-out of or level of adherence to climate-related risk management policies, such as credit risk assessment processes. These KRIs do not measure an institution's exposure to risk, but rather its performance in terms of rolling out climate-related risk management policies throughout the organisation. The establishment of these KRIs may be driven by internal checks that find cases where the institution's climate-related policies has not been adhered to.

For instance, one institution has in place a dedicated credit risk assessment for climate-related risks. The outcome of the assessment triggers the initiation of client engagement efforts with clients exposed to elevated climate-related risks. The institution has established a corresponding KRI to monitor the share of its portfolio that is not yet covered by this credit risk assessment, defining limits and attention thresholds.

Transparency about methodology and limitations underlying quantitative indicators

Institutions with quantitative KRIs describe, for instance, the reasoning for the calibration of quantitative limits, the factors considered and the underlying methodologies. In addition, institutions' internal reports are transparent about the limitations of their KRIs. The recipients of internal reports might, for example, be informed of the time horizon covered by indicators and whether the horizon used fully reflects the long-term nature of climate-related risks.

Institutions also define whether KRIs comprise only on-balance-sheet or also off-balance-sheet exposures. For instance, one institution identified limitations regarding the scope of its existing climate-related KRIs and decided to extend them to also cover off-balance-sheet exposures.

Monitoring and escalation arrangements

The way in which institutions monitor the compliance of their actions with their risk appetite typically follows the established procedures. For instance, an institution might use a red, amber, green approach, where "red" denotes risk appetite

breaches, “amber” attention thresholds and “green” alignment with the risk appetite. For red and amber levels, the institution pre-defines roles and responsibilities, deliverables (such as the potential need to draw up a remediation plan) and related approval processes, reporting lines and timelines. Where climate-related indicators are subject to dedicated escalation arrangements, these are clearly documented.

The table below provides an overview of observed quantitative KRIs.⁴

Table 20
Non-exhaustive list of observed quantitative KRIs

Indicator type	Definition	Description
Portfolio (mis)alignment	Thresholds for misalignments along transition trajectory	One institution has established KRIs based on its transition trajectory. These KRIs include misalignment thresholds that are regularly monitored and reported. The thresholds move along the transition trajectory of the relevant sectors based on the scenario the institution has used. If the sectoral portfolio exposure is above the trajectory at a given point in time, the threshold is breached, and escalation arrangements are triggered in line with the institution’s established governance processes.
Financed emissions	Financed emissions in the lending and investment portfolios	One institution has included an indicator relating to its financed emissions in the lending and investment portfolios in its RAF. The methodology underlying the metric is documented.
Quantitative limit at sectoral level (absolute amount)	Credit risk exposures to sectors subject to elevated climate-related risks	One institution has established a quantitative limit for sectors subject to elevated climate-related risks. The limit is set at an absolute level (i.e. a predefined amount) and covers both transition and physical risk drivers. There are predefined attention thresholds set below the limit. The methodology applied to set and calibrate the limit is documented. The institution is transparent in acknowledging that the limit does not yet integrate a longer-term risk perspective.
Quantitative limit at sectoral level (relative amount)	Credit risk exposures to sectors subject to elevated transition risks	Another institution has established a quantitative limit for sectors subject to elevated transition risk as a percentage of all corporate exposures. There are predefined attention thresholds set below the limit.
Quantitative limit at geographic level (absolute amount)	Credit risk exposures to geographies subject to elevated climate-related risks	One institution has established a quantitative limit for geographies subject to elevated climate-related risks. The limit is set at an absolute level (i.e. a predefined amount) and covers both transition and physical risk drivers. There are predefined attention thresholds set below the limit. The methodology applied to set and calibrate the limit is documented. The institution is transparent in acknowledging that the limit does not yet integrate a longer-term risk perspective.
Operational risk indicator	Physical climate event impacts on the institution’s operations	One institution has established a quantitative limit focusing on the physical impact of climate change on the institution’s operations. To calibrate the limit, the institution goes beyond historical losses and uses scenario analysis to assess the future impact of physical climate-related risk events on its operations.
Share of low-emitting loans	Percentage of loans to corporates with a low emissions profile	One institution has established limits and attention thresholds in the event that the loans in its corporate portfolio to companies classified as low-emitting drop below a predefined share of its overall corporate loan portfolio. The methodology for classifying loans, including the scope of emissions considered, is documented.

4.5 Data governance and internal risk reporting

Institutions are devising approaches to developing reporting frameworks for C&E risks. Typically, these approaches consist of three main components: a data gap analysis, a data collection strategy, and a data management and reporting framework. This section describes observed good practices at each of these stages.

⁴ For more information on good practices in this area, see ECB, “[The state of climate and environmental risk management in the banking sector – report on the supervisory review of banks’ approaches to manage climate and environmental risks](#)”, November 2021.

The most advanced institutions typically develop C&E-related data strategies aimed at compliance with their BCBS 239 approach⁵ and which are integrated into their established data governance and quality policies. They perform data gap analyses that, in addition to disclosure requirements, also take into account their risk management needs (including for internal risk reporting purposes), business objectives and commitments, if any.

Institutions collect C&E-related data from a variety of internal and external sources, establishing hierarchies that favour actual client data. They roll out questionnaires to collect client or asset-level data from a broad scope of customers (see also Section 5.1). When acquiring data from third-party providers, institutions assess the providers, for instance, in terms of the methodologies and assumptions they use and data quality. Ultimately, the institutions undertake actions to make their IT infrastructure fit for purpose and apply intermediate solutions to allow for immediate use of existing C&E-related data, where appropriate.

4.5.1

Good practice for data governance

Diving into data lakes – governance, processes and collection of C&E-related risk data

Expectation 6.1

Institutions are expected to develop a holistic approach to data governance for climate-related and environmental risks.

Expectation 6.2

As climate-related and environmental risks have distinctive characteristics, institutions are expected to consider adapting their IT systems to systematically collect and aggregate the necessary data in order to assess their exposures to these risks.

Expectation 6.4

An institution is expected to be able to generate aggregated and up-to-date climate-related and environmental risks data in a timely manner.

Institutions have put in place governance structures to support their C&E risk-related data strategy. This architecture is typically centralised, with institutions frequently establishing dedicated steering committees to oversee their C&E-related risk data strategies.

In one institution, the dedicated steering committee is chaired by a member of the institution's management body. Other members include several business areas, including risk functions, and representatives of local subsidiaries. The committee's decisions are binding upon all group entities and range from setting data gathering priorities to the use of specific metrics and methodologies. It also monitors the institution's data collection efforts. When carrying out its tasks, the steering committee has to take into account, among other things, the commitments voluntarily made by the institution.

Another institution places its dedicated steering committee at the helm of several work streams. The work streams cover various topics, such as foundational definitions for C&E-related data, IT infrastructure and the procurement of data from third-party providers. Several business areas, including risk functions, are involved in the work streams.

Institutions assess budget needs for their C&E-related data strategies. They allocate resources when gaps are identified.

Institutions take as a benchmark for their approach the Basel Committee on Banking Supervision's "Principles for effective risk data aggregation and risk reporting"

⁵ Basel Committee on Banking Supervision, "Principles for effective risk data aggregation and risk reporting", January 2013.

(BCBS 239). They aim to align their C&E risk data strategy with the approach to following these principles. Institutions also put in place several layers of control for data quality checks and integrate C&E-related data in their established data governance and quality processes.

Data gap analysis

Under the aegis of their (centralised) governance arrangements, institutions have conducted a data gap analysis of C&E risks. The starting point is typically an assessment of their data needs. Alongside upcoming disclosure requirements, this analysis covers the institution's: (i) risk management needs, including for internal risk reporting purposes, (ii) business objectives, and (iii) commitments, to ensure comprehensive coverage of their assessment.

Once data needs have been identified, institutions carry out a data gap analysis. This gap analysis also covers an institution's IT infrastructure and risk data aggregation capabilities. One institution also scrutinised its own processes for possible barriers to effective data collection. For instance, it found that its internal processes do not always provide clarity about when client-level data has to be collected in the context of customer transactions.

1. Data collection: Data sources

To overcome data gaps, as a first step, institutions develop tools to track the status of the data gaps, for example a centralised data catalogue. In addition, they typically try to identify synergies across various initiatives within the group or entity to overcome the observed gaps.

Table 21

Stylised and simplified example of a C&E-related data catalogue

Data type	Description (metric and methodology)	Data level	Collection deadline	Gap	Action (in case of gap)	External sourcing?	Responsible workstream
Scope 1, 2 & 3 financed emissions	Metric: CO2 tonnes. Methodology: client emissions data and data on sectoral average emissions	Client	DD-Month-202X	Yes	Roll out client questionnaire; supplement with PCAF data	Partially (name of provider)	Name of workstream
Total financed emissions		Client	DD-Month-202X	Yes			
Exposure to client	Gross carrying amount	Instrument	DD-Month-202X	No	N/A	N/A	Name of workstream
Fuel type of vehicle	Transport fuel (e.g. gasoline)	Instrument	DD-Month-202X	No	N/A	N/A	Name of workstream
Building construction year	Year construction finalised	Instrument	DD-Month-202X	No	N/A	N/A	Name of workstream
Building floor	Floor level	Instrument	DD-Month-202X	Yes	Roll out client questionnaire	No	Name of workstream
Building EPC	EPC label of building	Instrument	DD-Month-202X	Yes	Roll out client questionnaire; supplement with external data	Partially (name of provider)	Name of workstream

Institutions collect C&E-related data from a variety of internal and external sources. Internally, institutions might source information on:

- the industry code of a given client, the exposure to this client and the maturity of the underlying instruments;
- C&E-related data at the client or asset level, such as GHG emissions or EPCs, which institutions can obtain via client questionnaires (see Section 5.1).

Institutions complement internal information with external data sources. Typically, institutions make use of several external data sources, including: (i) client disclosures, (ii) publicly available or open-source data bases, tools and registers, and (iii) third-party data providers. An institution might, for instance, use open-source tools to collect C&E risk information, including for small businesses, for example as part of the calculation of PACTA portfolio alignment.

The following table shows a hypothetical example of an institution's data sources. The overlaps of data sources it shows could mean, for example, that the institution might supplement client or asset-level data sourced through questionnaires with a public or third-party provider.

Table 22
Stylised and hypothetical example of a fictional institution's data sources

High-level data type	Internal	Client questionnaire	Client disclosure	Public	Third-party provider
Industry code					
Client GHG emissions					
EPC of collateral					
Client transition plan					
Flood risk exposure					

Institutions have established hierarchies of data sources using actual client data supplemented by verified external data. Where neither of these are available, they use proxies as an interim solution. One institution, for instance, has used proxies to calculate the financed emissions of its full loan portfolio, describing limitations of the proxy-based approach which it uses as a starting point.

Institutions typically prioritise work on some of their sustainability-related data projects. The prioritised projects cover data that institutions urgently need for their wider sustainability efforts, including climate-related risk management tools. For instance, one institution prioritised data projects associated with its efforts to calculate financed emissions and assess the alignment of its portfolio with the goals of the Paris Agreement.

2. Data collection: Client questionnaires

Institutions typically use dedicated C&E risk questionnaires to collect client or asset-level data (see Section 5.1). Both small and large institutions use such questionnaires to collect data from a wide scope of customers. For instance, one institution extended its use of client questionnaires in transactions with SMEs. Institutions with a mortgage lending portfolio use client questionnaires to collect information on the collateral.

In terms of process, institutions typically embed the use of client questionnaires within their overall due diligence and client engagement procedures. One institution found that clients are not always willing to take the time needed to fill in the questionnaires, which can have an impact on the amount of client-level data it is able to collect. That institution is therefore experimenting with different options that encourage customers to fill in its questionnaires.

3. Data collection: Third-party providers

Currently, institutions tend to rely on a combination of internal and external data. External data are often procured from third-party providers. One institution carries out an assessment of its data providers, covering aspects such as data completeness and data quality. For instance, it observed limitations related to these aspects for one potential provider. Another institution drew up a catalogue of the data-related criteria it uses to evaluate third-party providers. These criteria include the granularity of the data for both transition and physical risks, as well as the scenarios and time horizons used by providers in their methodology (see the table below for a non-exhaustive overview of observed assessment criteria).

Yet another institution includes the procurement of data from third-party providers in its internal audit plan. The corresponding review by the internal audit function found that the institution needs to increase its understanding of the sources, data and methodologies used by data providers.

Table 23
Non-exhaustive list of criteria used to assess third-party data providers

Type of criterion	Description of criterion
Data quality	Data completeness Data quality
Granularity of data	Coverage of acute and chronic physical risk drivers Geographical coverage of risk drivers Geolocation of assets, aggregation capabilities for companies with multiple locations
Data output	Level at which the exposure assessment is performed (e.g. asset level) Type of exposure metric used (e.g. loss metrics, absolute amount or percentage of overall asset value)
Methodology	Scenarios used by data provider and alignment with IPCC projections Time horizon covered by the forward-looking projections
Data provider	Responsiveness of data provider Cost

Operational solutions and IT infrastructure

Institutions establish internal procedures and infrastructure solutions to ensure that all C&E-related data, whether sourced internally or externally, are available and assigned with a golden source or single version of the truth. For instance, an institution might prepare a data dictionary, assign responsibilities for data collection and define the golden source, as well as outline control procedures, quality indicators and data remediation processes.

Institutions frequently opt for a centralised IT platform encompassing all of their sustainability-related data. This platform functions as a repository for data that are sourced both internally and externally. It also operates as a reference mechanism to establish a single source of truth for data that have been sourced and internally quality controlled. With a view to ensuring immediate usability of data already collected, one institution has rolled out a temporary IT solution pending completion of the work on the final infrastructure.

4.5.2

Good practice for internal risk reporting

On the radar – internal reporting on climate-related risks

Expectation 6.3

An institution's risk reports are expected to convey the impact of climate-related and environmental risks on its business model, strategy and risk profile.

Institutions typically align their practices for internal reporting on climate-related risks with their risk appetite frameworks (e.g. they report on the institution's climate-related KRIs and limits), risk management tools (e.g. they report on the development of risk scores assigned to clients via the institution's dedicated credit risk assessment tool) and climate-related business strategy (e.g. they report on the institution's performance vis-à-vis its KPIs and targets). Moreover, institutions inform the management body of developments that may impact the institution's risk profile and business model (e.g. media reports on specific clients).

Institutions typically integrate climate-related risk reporting in their established risk management reports and follow the regular reporting frequency. Climate-related risk reporting to the management body typically takes place on a quarterly basis, with some internal reports being produced more frequently, for instance on a monthly basis.

Some institutions take intermediate steps to put the management body and senior managers in a (starting) position to make informed decisions. For these intermediate reporting practices, they focus on climate-related risk exposures to which they find themselves to be materially exposed and for which they have already developed risk indicators. Recipients of the reports are informed that these initial reports will be expanded with additional indicators and metrics.

Table 24

Non-exhaustive and stylised examples of frequently observed internal risk reporting items

High-level item reported or risk type	Frequency
Transition risk KRIs	Quarterly
Physical risk KRIs	Quarterly
Operational risk KRI	Quarterly
Reputational risk indicators	Monthly
Green asset ratio	Monthly
High GHG emitting loan exposures	Monthly
Portfolio alignment: Misalignment across sectors	Annual, moving to quarterly
Institution's performance vis-à-vis climate-related targets	Quarterly
Financed emissions (dashboard)	On demand
Portfolio alignment (dashboard)	On demand
Climate-related credit risk assessment tool scores	Quarterly
Market risk: Transition scenario assessment (price shock)	Quarterly
Liquidity risk (undrawn facilities subject to climate-related risks)	Quarterly

5 Risk management

This section addresses good practices related to the risk management framework and associated processes to monitor and mitigate C&E risks. The supervisory expectations set out the way in which institutions should integrate C&E risks into credit, operational and market risk management, as well as into the ICAAP overall, including risk quantification by means of scenario analysis.

This section directly builds on Section 2 on the materiality assessment. Whereas Section 2 addresses how institutions have developed risk identification procedures to inform their judgement on materiality, this section shifts the focus onto the ways in which institutions are managing C&E risks that are material – or likely to be material. The good practices are drawn from the observed use by institutions of tools and approaches to monitor and mitigate the impact of C&E risk drivers on credit, operational and market risk management. In some cases, certain risk monitoring or mitigation tools can be used across multiple risk types. For example, exclusion criteria can be used to mitigate both credit risk related to the institution's lending portfolios and market risk stemming from its investment portfolios. This section describes the various types of risk monitoring and mitigation tools available to manage C&E risks. There is also a dedicated chapter on the good practices for environmental risks other than climate-related risks, such as biodiversity loss, pollution and water stress.

Table 25
Good practices for risk management

Section	Topic	Description	Expectation
Due diligence	Data collection	Data-driven due diligence of (new) clients	7.5, 8.1
	Controversies	Assessing clients for potentially controversial activities	7.5, 9.2
Risk classification	Credit risk	Classifying debtors via a scorecard and/or integration in PD-rating systems	8.2, 8.4
	Market risk	Classifying exposures to transition risk in the trading portfolio	10
	Operational risk	Assessing physical risks to the business continuity of operations	9.1
Collateral valuations and pricing	Loan pricing	Integrating C&E risks in loan pricing frameworks	8.5, 8.6
	Collateral valuations	Reflecting C&E risks in the valuation and management of collateral	8.3
Capital	ICAAP	Allocating economic capital for material C&E risks	7.6
Environmental risks	Exclusion approach	Excluding clients conducting activities with adverse environmental impact	8.1
	Due diligence	Addressing environmental risks in client due diligence	7.5
	Risk measurement	Portfolio foot-printing to assess impact on biodiversity	7

5.1 Due diligence

Many institutions have established client due diligence procedures that address C&E risks. Such procedures are often the first interaction institutions have with their

clients on C&E risks. Typically, institutions perform a screening of the client in relation to exclusion criteria set in lending policies, then proceed with collecting relevant data through client questionnaires. Thereafter the institution forms a view on the level of risk and makes a subsequent credit decision (for example on granting credit or intensifying monitoring). More advanced practices take a granular approach that is fully integrated into the risk management framework which also covers existing clients, while more basic practices tend to stay more general and focus only on new clients.

Some institutions use the due diligence procedure to form a view on the level of credit risk the client has, while others take an approach from a reputational risk point of view. The former case is covered in the first good practice described in this section, while the latter is addressed by the second good practice.

5.1.1

Good practice for data collection

Better safe than sorry – data-driven due diligence of (new) clients

Expectation 7.5

Institutions are expected to conduct a proper C&E due diligence, both at the inception of a client relationship and on an ongoing basis.

Expectation 8.1

Climate-related and environmental risks are expected to be included in all relevant stages of the credit-granting process and credit processing.

Several institutions have developed advanced approaches to embedding C&E risks into their client due diligence and lending policies. These typically consist of the following steps:

1. Lending criteria

The starting point for integrating C&E risks into client due diligence and lending policies is generally to establish lending criteria for sectors and/or activities that are in line with the institution's risk appetite. Such criteria can take the form of exclusion criteria used to determine which activities are deemed non-acceptable to finance from a C&E risk perspective, or phasing out criteria incorporating a forward-looking perspective by setting long-term targets to limit concentration or to phase out certain types of exposure. By applying such risk-based lending criteria, institutions start to manage their appetite for C&E-related risks. Examples of these types of criteria are as follows:

- Exclusion criteria: For example, no financing of companies that rely on coal for more than 25% of their energy mix.
- Phasing out criteria: For example, setting targets to phase out exposures to certain CO₂-intensive sectors by a set date, thereby also limiting the maximum loan duration for new debtors.

2. Data collection and risk assessment

For clients not excluded from financing based on these criteria, the institution continues the due diligence by performing a client-level risk assessment. In order to develop such a view, the institution puts in place in a client questionnaire to collect the client and asset-specific data needed to assess relevant transition and physical risk drivers. This includes both quantitative and qualitative risk data. The table below provides a non-exhaustive overview of observed practices in this regard.

Table 26

Non-exhaustive list of data items collected to inform risk assessment during due diligence

Type of data	Data	Description	Targeted risk driver
Quantitative data	Current and projected total GHG emissions	An estimate of the total current and projected GHG emissions of financed assets broken down by Scope 1, 2 and 3 emissions (e.g. tCO ₂ or tCO ₂ e/t produced product)	Transition risk (e.g. policies and regulations)
	Fossil fuel dependency	Production, processing, distribution, storage, or combustion of fossil fuels (percentage of revenues/production volumes)	Transition risk (e.g. policies and regulations)
	Geographical location data	Granular data on the geographical location of financed assets and/or main client activities (e.g. postal codes)	Physical risk (e.g. flooding)
	Energy consumption intensity	An estimate of the energy consumption of clients (e.g. gigawatt hours – GWh), including a split of the share of (non-)renewable sources	Transition risk (e.g. policies and regulations)
	Water consumption intensity	An estimate of the water consumption of client activities in million m ³	Physical risk (e.g. water stress)
	Energy performance certificate	EPC for both residential and commercial real estate	Transition risk (e.g. market sentiment or regulation)
	Sustainable building certificate	Sustainability certificate for construction projects (e.g. BREEAM or LEED)	Transition risk (e.g. market sentiment or regulation)
Qualitative data	Adverse media check	Is debtor involved in controversies related to climate change and/or environmental degradation?	Reputational and liability risk
	Assessment of impact of C&E regulations	Does the debtor assess the impact of upcoming regulations related to climate change and environmental degradation?	Transition risk (e.g. policies and regulation)
	Adherence to sustainability reporting	Does the debtor adhere to sustainability reporting standards (e.g. CSRD)?	Reputational and liability risk
	Implementation of C&E risk policies	Does the debtor have policies in place that address key possible C&E risk issues occurring in its operations?	Transition and physical risks (e.g. biodiversity loss)
	Production, use or disposal of chemicals	Does the debtor produce, use or dispose of chemicals?	Transition risk (e.g. consumer preferences)
	Time-bound emission reduction plans	Does the client have time-bound plans in place to align its GHG emissions with, for example, the Paris Agreement objectives?	Transition risk (e.g. policies and regulations)

The institutions then leverage such data sources to form a view of the level of risk, often translating this view into client-specific C&E risk ratings. Such ratings typically indicate risk differentiation (for example, high, medium or low risk). This also allows the institution to rank clients along certain dimensions, for instance sector classification, and thereby assess the respective client compared with its peers.

3. Acceptance criteria and portfolio thresholds

As a next step, institutions determine whether the level of C&E risk is acceptable and in line with their risk appetite. Certain institutions will not finance debtors with a high C&E risk classification, while others will make credit granting dependent on the involvement of specific C&E risk experts or link specific conditions to the loan contract (e.g. risk mitigation through requiring an insurance or ensuring that a transition plan is in place).

At portfolio level, some institutions have put in place threshold levels for the overall acceptance of clients with poor C&E risk classifications. Such relative thresholds prescribe the percentage of clients within a specific loan portfolio for which a poor

C&E risk rating can be accepted. These thresholds are in addition to absolute limits on acceptance of clients with poor C&E risk ratings.

4. Ongoing review

Following the start of a client relationship, the due diligence process is repeated on a regular basis. The periodicity is generally determined by the institution based on the risk classification of the client. In addition to performing an ongoing C&E risk review for new clients, many institutions also perform a review for existing clients.

5.1.2

Good practice for controversial activities

Hard to gain but easy to lose – assessing clients for potentially controversial activities

Expectation 7.5

Institutions are expected to conduct a proper C&E due diligence, both at the inception of a client relationship and on an ongoing basis.

Expectation 9.2

Institutions are expected to evaluate the extent to which the nature of the activities in which they are involved increases the risk of a negative financial impact arising from future reputational damage, liability and/or litigation.

One institution has a framework in place to identify and evaluate potentially controversial economic activities related to C&E factors on an ongoing basis. This framework of due diligence procedures is organised in the context of managing C&E-related reputational risks arising for the institution. It identifies the activities of its clients that present such reputational risks. The approach taken involves the following steps:

1. Identification

The front officer is responsible for making an initial assessment of the reputational risks for the institution associated with confirming or continuing a client relationship. This assessment comprises a check of the client against reputation-sensitive exclusion factors, a list of economic activities typically associated with significant adverse environmental impact, verification of the existence of negative news in the media and identification of possible future controversies related to C&E factors.

2. Evaluation

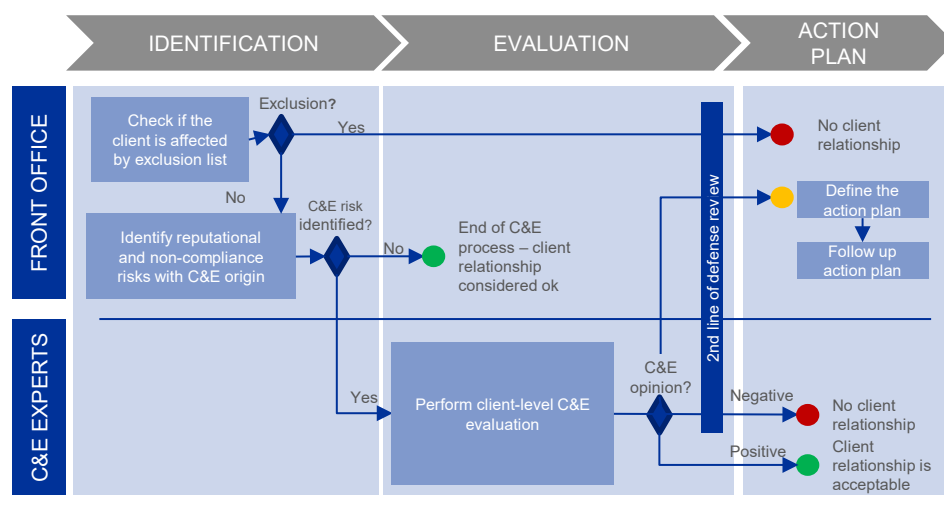
If concerns are identified, a detailed evaluation is performed by a C&E risk expert. This includes among others:

- checking the compliance of the client with the institution's commitments, sectoral standards and best practices;
- determining the severity of existence of negative news (e.g. convictions, legal proceedings and judicial/criminal complaints of a C&E nature);
- determining the severity of possible controversies (e.g. local experts are employed to assess whether upcoming local regulation and policies may trigger future controversies).

This evaluation leads to three possible decisions: i) start/continue relationship with the client; ii) start/continue the relationship with the client conditional on the fulfilment of certain criteria; iii) rejection of the client.

Figure 3

Stylised example of C&E reputational risk management approach for new clients



3. Action plan

An action plan is defined based on the risks identified. When the client relationship is confirmed with conditionality, follow-up actions may include requiring the client to adopt the best practices in its sector of activity or requiring it to improve its C&E practices to better align them with the commitments of the institution. In addition, the institution can restrict the depth of the business relationship with that client, or to certain specific affiliates of the client. For clients subject to such conditionality, an implementation schedule is defined in agreement with the client.

5.2 Risk classification

Institutions are developing a variety of ways to reflect C&E risks in the risk classification of clients. Most common are stand-alone client scorecards on C&E risks. In most cases C&E risks are embedded in the risk classification mostly through qualitative considerations. However, for some institutions, the C&E risk scorecards can trigger rating overrides in the PD models, thereby having an indirect impact on PD estimation. Other institutions have developed dedicated questionnaires from which they gather C&E risk-related information (see good practices in Section 5.1). The qualitative and quantitative input from these questionnaires, which in most cases covers transition risks and in some cases aspects of physical risks, is used to develop heatmaps to classify institutions' portfolios based on the level of C&E risk.

The good practices presented in this section describe risk classification systems related to credit, market and operational risk separately.

5.2.1

Good practice for credit risk classification

At calculated risk – classifying debtors via a stand-alone scorecard and/or integration in PD-rating systems

Expectation 8.2

Institutions are expected to adjust risk classification procedures in order to identify and evaluate, at least qualitatively, climate-related and environmental risks.

Expectation 8.4

Institutions are expected to monitor and manage credit risks in their portfolios, in particular through sectoral/geographic/single-name concentration analysis, including credit risk concentrations stemming from climate-related and environmental risks, and using exposure limits or deleveraging strategies.

Many institutions have developed dedicated questionnaires from which they gather C&E risk-related information (see good practice 5.1.1). Some already have a risk differentiation system in place to classify clients. Typically, this is done by developing a stand-alone C&E risk scorecard for clients, for example featuring an adapted traffic light system with standardised levels (i.e. green, amber and red). The scorecard is then factored into the discussions on lending decisions and credit files in the respective credit committees. In some cases, the institution integrates the outcome of the client scorecard in its PD-rating system in a qualitative manner. For example, by setting concrete criteria that trigger a downward override of the PD rating if the scorecard is poor or through the integration of qualitative C&E-related findings in the business risk or business environment assessment component of the PD rating system.

Stand-alone scorecard

For example, one institution develops a stand-alone scorecard to classify its corporate clients for transition risk specifically. The scorecard consists of two weighted components: 1) a client awareness metric, and 2) a carbon transition metric. The former assesses to what extent the client is aware of C&E risks along four dimensions in line with the TCFD (governance, risk management, strategy, and metrics and targets). The latter assesses the threat of climate change to the client's business model and profit-generating capacity, addressing the client's current carbon intensity, medium-term outlook and adaptive capacity. The two scores are converted into a ten-point scale bundled in four categories (advanced, strong, moderate and poor). Depending on the applicable category, together with the client's PD rating, there are predefined follow-up actions. This could, for instance, consist of a requirement for the client to reinforce its decarbonisation plans, no increase in lending limits or a maximum maturity of three-five years for any financing to the client. The table below provides more details on the various components of the client scorecard.

Table 27

Stylised example of transition risk scorecard for corporate clients

Component	Sub-component	Client-level inputs for scorecard
Client awareness metric	Governance	- Governance reporting in line with the TCFD standard - Environmental risk rating by external, independent third party
	Strategy	- Strategy disclosure in line with the TCFD standard - Strategy in line with a 1.5 degrees Paris Agreement scenario - Net-zero emission targets
	Risk management	The integration of climate-related risks in client's risk management in line with TCFD
	Metrics and targets	- Disclosure of Scope 1, 2 and 3 GHG emissions - Disclosure of targets to reduce risks stemming from climate change
Carbon transition metric	Current carbon profile	- Exposure to hydrocarbon value chain - Level of GHG emissions
	Medium-term sensitivity to transition risk	Client's sensitivity to technology, market and policy changes related to climate change, including in the context of its competitive positioning within its market
	Medium-term adaptive capacity	Client's ability to mitigate transition risk exposure in the medium term, specifically by assessing the degree to which transition risk exposure is reflected in robust CAPEX plans

Integration into PD-rating systems

Another institution has integrated both physical and transition risks based on qualitative considerations in its PD rating systems for large corporate and real estate clients. Its PD rating system includes an assessment of any reputational risks, liability risk and negative environmental impact of the client. The institution has developed an environmental risk questionnaire that collects qualitative and quantitative data on the client's risks related to climate change, animal welfare, waste and pollution, and land use. In addition to collecting this client data, the institution also considers environmental risk ratings of external providers, where available. Based on the outcome of this assessment, the client is classified as having a low, medium, high or very high risk of financial loss resulting from transition and/or physical risks. Formalised guidelines are implemented that prescribe specific conditions under which the results should be integrated in the reputational risks, liability risk and negative environmental impact component of the PD rating system. Depending on the level of risk for the client and its adaptive capabilities, this may lead to a downgrade of up to several notches of the PD rating.

5.2.2

Good practice for market risk classification

A trick of the trade – classifying exposures to transition risk in the trading portfolio

Expectation 10

Institutions are expected to monitor on an ongoing basis the effect of climate-related and environmental factors on their current market risk positions and future investments, and to develop stress tests that incorporate climate-related and environmental risks.

One institution has implemented a classification system to identify and monitor which positions or activities in the trading book (fixed income and equity portfolios) are the most exposed to C&E risks. The system focuses exclusively on transition risk. The approach taken consists of the following steps:

1. develop a risk classification of C&E risks at sector level;

2. aggregate activities and positions at sector level;
3. quantify transition risk in terms of mark-to-market exposure for each position based on its sector classification.

The institution uses a qualitative approach to identify sectors most exposed to transition risk. This approach considers four main sources of risk: i) political and legal risk; ii) technological risk; iii) risk of change in market dynamics; and iv) reputational risk.

Sectors are classified based on risk sensitivity and the time horizon within which the risk may manifest itself as follows:

- Sectors with very high sensitivity: positions which are expected to be materially affected by transition risk within a three-year period (e.g. coal and mining).
- Sectors with high sensitivity: positions which are expected to be materially affected by transition risk within a three to five-year period (e.g. automotive, air transport).
- Sectors with medium sensitivity: positions which are not expected to be materially affected by transition risk before five years (e.g. gas distribution and commercialisation).
- Sectors with low sensitivity: positions which are not expected to be materially affected by transition risk.

To improve the robustness of the classification, the institution calibrates the internally developed sector classifications by leveraging C&E risk scores and information from external data providers. The institution consulted the scores from the four main providers in the market, also evaluating the quality and homogeneity of the scores. The institution then adjusts its classification of sectors accordingly.

Based on each sector's sensitivity to transition risk, the institution derives the sensitivity to transition risk for each position or activity, and quantifies the mark-to-market exposure of activities or positions with high or very high sensitivity to transition risk for each portfolio (fixed income and equity).

Table 28

Stylised example of the classification of sensitive positions or activities to transition risk

(EUR millions)

Positions EQ Portfolio	Fair value				Total
	Sensitivity – Very high	Sensitivity – High	Sensitivity – Medium	Sensitivity – Low	
Stock A	80.4	-	-	-	80.4
Stock B	-	50.6	-	-	50.6
Stock C	-	-	1.5	20.5	22.0
Stock D	10.5	-	-	2.3	12.8
Stock E	5.5	-	-	-	5.5
Total	96.4	50.6	1.5	22.8	171.3

Source: Based on documentation provided by the institution.

The institution revises the classification of sectors and positions or activities quarterly. The results of the classification are used to set a transition risk indicator, which is employed as a tool to make portfolio decisions on the reduction of exposure towards highly sensitive positions or activities.

5.2.3

Good practice for operational risk classification

To be continued – assessing physical risks to the business continuity of operations

Expectation 9

Institutions are expected to consider how climate-related and environmental events could have an adverse impact on business continuity and the extent to which the nature of their activities could increase reputational and/or liability risks.

The institution assesses the impact of physical risks (e.g. major floods, natural disasters) on its operations within its operational risk framework, using forward-looking scenario analysis to quantify the risks from weather hazards. These scenario analyses are adjusted in a forward-looking manner to integrate the aggravation stemming from climate change (for example, using external data providers). The institution then uses this information to build a tool for the identification and classification of high risk exposures to business continuity disruptions.

The approach taken consists of the following steps:

1. Hazard

For each geographical region in which it is active, the institution identifies the main material physical risk events affecting its operations. For example, for the US region, the institution identifies wildfires, floods and hurricanes as the main material physical risk events. For this assessment, the institution makes use of external data providers.

2. Exposure

The institution then assesses which of its office buildings, recovery sites and third-party suppliers/providers (e.g. data centres) may be exposed to those risk events. It maps the location of these facilities onto wildfire, flood and hurricane hazard maps.

The institution identifies four resource categories which can be affected by these events, namely personnel, data, services and facilities.

Table 29

Stylised example of classification of resource categories on a regional basis (for example, the United States)

	Risk event: Loss of operating environment			
Physical risk event	Lack of personnel	Loss of data	Loss of facilities	Loss of services
Wildfire risk	MEDIUM	LOW	HIGH	MEDIUM
Hurricane risk	MEDIUM	LOW	HIGH	MEDIUM
Flood risk	LOW	LOW	LOW	LOW
Total	MEDIUM	LOW	HIGH	MEDIUM

3. Vulnerability

A classification system is put in place with three levels, namely low risk, moderate risk and high risk. The institution identifies the office buildings, recovery sites and third-party suppliers/providers that are exposed to medium to high risk. For these cases, it may decide to relocate activities or implement actions mitigating the risks of potential damage to its operations from physical risks as follows:

- (a) compile a high-risk location watchlist, used to determine in which region the institution should have contractual agreements (e.g. insurance policies, agreements with hotels in case of staff relocation, agreements with taxi companies) in place with third-party providers and building owners to manage such extreme weather events;
- (b) define rules and set up procedures for personnel to follow should these events materialise (e.g. staff relocation, teleworking).
- (c) conduct periodic updates of the risk assessment and risk-mitigating plans for each of the office buildings, recovery sites and third-party suppliers/providers (e.g. through ad-hoc questionnaires).

5.3 Collateral valuations and pricing

Institutions are starting to integrate C&E risks in collateral valuations and pricing. For many institutions, this process is still in early stage of development, as it is usually conditional on the systematic collection of granular and forward-looking client data. For example, a group of leading institutions is using energy performance certificates of financed buildings to reflect C&E risks in both collateral valuations and pricing. In terms of pricing, some institutions are reflecting the risks in their cost price calculations (via PD and/or LGD) and margin requirements. Similarly, a small group of leading institutions has started integrating C&E risk metrics in collateral valuations, using qualitative and quantitative methods (e.g. scores, haircuts and thresholds).

This section covers good practices for the integration of C&E risk in collateral valuations and loan pricing.

5.3.1

Good practice for loan pricing

Paying the price – integrating C&E risks in loan pricing frameworks

Expectation 8.5

Institutions' loan pricing frameworks are expected to reflect their credit risk appetite and business strategy with regard to C&E risks.

Expectation 8.6

Institutions' loan pricing is expected to reflect the different costs driven by C&E risks.

Several institutions have started to integrate C&E risks in their loan pricing frameworks in a systematic manner. This is done in at least two distinct ways. First, institutions reflect elevated C&E risks in the cost price calculations of their loan prices. This is, for example, done by integrating risk factors in the calculation of credit and funding costs. Second, institutions reflect C&E-related factors in the expected profit margin requirements of certain lending products. This is done to incentivise debtors who are reducing their exposure to C&E risks. The table below shows some examples of how institutions have been observed to integrate C&E risks in their loan pricing.

Table 30

C&E risk integration across loan price components

Price component	Sub-component	C&E risk integration
Cost price	Credit costs	Institution has C&E risk rating system that can indirectly impact the credit cost component of the loan price as risk managers can force a downwards override of the client rating if the C&E risk rating is poor.
	Funding costs	Institution offers green deposits (with fiscal benefits) for lower rates than for ordinary deposit products. This entails lower funding costs being passed on to lower rates for green lending products.
Margin	Reduction	Institution offers green lending product with lower margin requirements, or sustainability-linked loans where interest rate discounts (in basis points) are dependent on the client meeting C&E risk targets.
	Increase	Institution offers sustainability-linked loans for which interest rate discounts are dependent on meeting C&E risk targets. If the C&E risk targets are not met, the margin requirement goes up (in basis points).

As described in the table above, one way to integrate C&E risks in loan pricing is to offer sustainability-linked loans. For these products, the loan terms for debtors are conditional on achieving certain KPIs related to their C&E risk exposure. These KPIs are quantifiable and forward-looking in nature and address the debtor's core business and strategy. The targets are set at regular intervals with increasing thresholds, which are monitored by the institution. When targets are met, the debtor receives an interest rate discount; when targets are not met, this could lead to a rise in the interest rate. A key component of this approach is having an objective methodology to measure the KPIs by means of independent verification.

The table below outlines an observed example of such a practice. It concerns a product for a client that has in place a transition plan aimed at reducing its CO2 emissions, energy use, water use and polluting emissions by a predefined amount by 2030 and achieving carbon neutrality by 2050, along with improving safety metrics. The KPIs set out in the loan contract are constructed in line with this transition plan.

Table 31

Stylised example of a loan contract with sustainability-linked KPIs and verification methods

KPIs	Description of KPI	Methodology/verification/perimeter evolution	Adjustment of the interest margin
CO2 equivalent Scope 1 and 2 emissions	Emission reduction pace of -x% per year to achieve the overall emissions reduction target by 2030 in line with the client's own ambitions.	The KPI is calculated according to the standard enacted by ISO 14044 and ISO 14064. Figures are audited by external auditors and published in the client's sustainability report or equivalent. Acquisitions by the client of other entities are excluded from the calculation of the KPI.	The facility margin is adjusted on a yearly basis depending on the client's performance vis-à-vis the two KPIs. For each KPI, a potential margin adjustment of +/- pre-set basis points is foreseen. The overall margin adjustment is determined by the sum of the margin adjustments for each of the KPIs.
Annual incident rate	KPI is fully achieved if the client's annual incident rate overperforms the sectoral benchmark (set by a third party) by a predefined percentage. KPI is missed if the client's annual incident rate underperforms the sectoral benchmark by more than a predefined percentage.	The sectoral benchmark is drawn up by a global body that convenes industry representatives. Figures are audited by external auditors and published in the client's sustainability report or equivalent. Acquisitions by the client of other entities are excluded from the calculation of the KPI.	

Other institutions have developed similar sustainability-linked products with KPIs that address C&E risks. The table below describes several of these observed practices, covering a variety of sectors.

Table 32

Examples of sustainability-linked products by sector

Sector	Product	Characteristics of the KPIs	Adjustment of the interest margin
Shipping	Revolving credit facility	1. Carbon efficiency of the company's entire fleet measured by the weighted average Annual Efficiency Ratio (AER) per ship and to be aligned with the decarbonisation trajectory of e.g. the International Maritime Office; 2. Alternative fuel mix of the fleet, measured as a percentage of biofuels used; 3. Sustainable recycling of ships, measured as a percentage of the fleet with the so-called Inventory of Hazardous Materials certification.	On a yearly basis, the margin is reduced by a pre-set amount of basis points if the client meets the annual AER targets. If these are not met, the margin is increased by a pre-set amount of basis points annually.
Energy	Bond	1. Scope 1 and 2 net GHG emissions by a given date (predefined amount of MtonCO ₂ e representing a reduction of xx% vis-à-vis a base year); 2. Renewable energy installed capacity by a given date (predefined amount of gigawatts).	The interest rate remains unchanged subject to the achievement of the KPIs. If one of the KPIs is not met, the interest rate is increased by pre-set amount of basis points.
Real estate	Revolving credit facility	1. GHG emissions of residential and commercial real estate; 2. Share of energy efficient buildings based on an environmental sustainability assessment standard; 3. Energy consumption per square metre.	The more KPIs the client meets, the higher the margin reduction up to pre-set basis points per annum.

5.3.2

Good practice for collateral valuations

Not at face value – reflecting C&E risks in the valuation and management of collateral

Expectation 8.3

Institutions are expected to consider climate-related and environmental risks in their collateral valuations.

Some leading institutions are starting to consider physical and transition risk drivers in the valuation and management of collateral.

For example, an institution uses specialist software to quantify physical risks to real estate through the probability of occurrence of a natural hazard (e.g. floods, hurricanes) and the vulnerability of the real estate to the hazard in conjunction with the real estate value (i.e. restoration costs). This assessment is used to integrate physical risks in the valuation of collateral for all new financing (unless sufficient insurance coverage is in place). As part of the assessment, the institution performs a location-specific risk analysis to quantify physical risks, using geospatial mapping and local geographical characteristics (e.g. building type, the type of surrounding terrain, the features of the construction, (public) transport routes). Using natural hazard maps (e.g. floods, droughts, wildfires), the model constructs so-called vulnerability functions to translate, for example, flood level distributions into probability distributions for damage ratios (i.e. the cost of repairing flood damage, as a percentage of house prices). This allows the institution to calculate risk estimates, also taking into account any general hazard protection and/or building-specific mitigation measures that may be in place. These risk estimates are translated into expected damages and losses, which are taken into account in the valuation of the collateral.

Other institutions include transition risks in the collateral valuation process by considering the energy label of the property as a minimum requirement to be included in the valuation report for immovable property collateral, which may affect the LGD and expected credit losses. In addition, in the collateral valuation process, some institutions may require mitigating measures where appropriate (e.g. insurance protection, including flood protection) to reduce the potential impact of climate-related risks to the collateral. The table below provides an overview of relevant metrics used by institutions to reflect C&E risks in the valuation and management of collateral.

Table 33

Non-exhaustive list of relevant metrics for collateral valuation and management

Type	Risk drivers	Relevant metrics
Collateral valuation	Physical risk	- Forward-looking estimates of the likelihood of a natural hazard (storm, floods, heavy rain, hail, hurricane) - Geospatial location data and object type (e.g. number of floors) - Expected reinstatement costs for damages
	Transition risk	- Energy efficiency certificates (e.g. EPCs) - Sustainable building material certificates (e.g. BREEAM, MPG, DGNB)
Collateral management and mitigation	Physical risk	- Insurance schemes (e.g. flood insurance, building insurance, business disruption insurance) - Government protection schemes
	Transition risk	Exclusions (no longer financing building near protected areas, e.g. Key Biodiversity Areas, Equator Principles)

5.4 Capital adequacy and portfolio analysis

Many institutions are assessing capital adequacy in the context of C&E risks as part of their ICAAP. Typically, such assessments are conducted using scenario analyses in order to take into account forward-looking factors over a longer time horizon. The ICAAP generally includes a description of the scenarios, often with separately formulated scenarios for transition and physical risk, and a calculation of the scenario impact on quantitative metrics, such as provisions, capital and profitability. Less advanced practices do not yet calculate a quantitative impact for the C&E risk scenarios. In some cases, institutions also decide to allocate economic capital based on the outcome of the capital adequacy assessments. In other cases, institutions have decided to reflect C&E risks as part of the management buffer, while working on obtaining more granular data and risk quantification methods.

The good practice described below outlines a selection of observed practices by institutions that specifically allocate economic capital for C&E risks.

5.4.1 Good practice for economic capital allocation In capital letters – allocating economic capital for material C&E risks as part of the ICAAP

Expectation 7.6

Institutions are expected to assess the impact of C&E risks on their capital adequacy from an economic and a normative perspective.

Several institutions have developed advanced ways of integrating C&E risks to assess capital adequacy. While typically relying on scenario analyses, institutions use different approaches for credit, market and operational risks. In all of the cases outlined below, the institutions concluded the capital adequacy assessment with the decision to allocate additional economic capital specifically for C&E risks.

Capital adequacy assessment for credit risk

In order to reflect the forward-looking nature of the risks, one institution leverages scientific climate pathway scenarios (e.g. NGFS and IPCC) to assess physical risks and transition risks. These scenarios are then used to simulate the stress impact on the institution's portfolios. For this, the institution employs a simulation tool that uses external data (e.g. asset-level data, price data) and client data to estimate the impact of the scenarios. Using this tool to model expected change to earnings before interest, taxes, depreciation and amortization (EBITDA), the institution can estimate the PDs at client level under the various scenarios by 2030 (taking into account the longer time horizon associated with C&E risks). These stressed client-level PDs are then aggregated to sector portfolio level, which allows the institution to generate sector-level heatmaps to identify which sectors are most impacted by C&E risks.

As a next step, the institution calculates the difference between the stressed portfolio PD and the baseline portfolio PD, which is the exposure at risk due to C&E risk. As the calculated difference surpassed the materiality threshold, the institution decided to allocate a dedicated economic capital buffer for that amount of exposure at risk, addressing both transition and physical risks.

Capital adequacy assessment for operational risk

In its ICAAP, one institution considers several climate-related risk drivers that could trigger material operational risks. To assess its capital adequacy, the institution's risk identification process identifies four plausible scenarios that could materialise in the next 12 months.

Scenario 1: Damage to physical assets (e.g. floods).

Scenario 2: Business disruption and system failures (e.g. floods).

Scenario 3: Non-compliance with climate-related laws, rules and regulations.

Scenario 4: Reliance on outsourcing (e.g. floods).

For each of the scenarios, the institution develops loss estimates considering a range of hypothetical impacts that include the potential of remediation costs, legal costs, regulatory sanctions, client compensation, asset write-down and forgone revenue. These estimates are, in turn, supplemented by historical loss events and/or entity specific data. For example, when assessing the potential legal fees and regulatory sanctions resulting from non-compliance, the litigation team will look to appropriate internal and external loss data on litigation cases to help inform potential losses for such scenario. Based on the outcome of these scenarios, the institution concluded that two of these could lead to material risks to capital adequacy, and thus decided to increase its operational risk economic capital buffer by the loss amounts estimated as part of those scenarios.

Capital adequacy assessment for market risk

One institution assessed the effects of physical and transition risk on market risk (i.e. credit spread, interest rate, equity, commodity and exchange rate risk) for its trading book. The institution used scenario analyses for both physical and transition risk.

For transition risk, the institution derives scenarios primarily from publicly available sources (e.g. NGFS and IPCC). These scenarios are used directly as an input for a scenario analytics tool, which is further deployed to obtain a more granular internal scenario extension. From a portfolio coverage perspective, the institution includes all relevant market risk exposures (i.e. bonds, equity and derivatives). The scenarios cover different severity levels and include a baseline scenario (orderly transition scenario) and an adverse scenario (disorderly transition scenario). For the sensitivity analysis, the institution uses a sensitivity-based P&L simulation to understand the impact of selected C&E risk-related variables (e.g. carbon prices or credit spreads of affected sectors). The institution also models the possible impact of the stress event on volatilities and risk correlations.

For physical risk, the institution uses several stress test scenarios to assess and quantify the impact on P&L of extreme weather events for its trading book. The institution takes inspiration from extreme real-life weather events to define the scenarios (for example, a 2007 cyclone, 2012 Hurricane Sandy, 2017 southern-EU drought). For each scenario, it considers different shocks (for example, large sell-off, small sell-off, oil crisis, foreign exchange crisis, etc.). The institution considers a total of eight different scenarios including extreme precipitation, hurricanes, droughts,

lethal heat waves, water supply issues, increase in average temperatures, and sea level rise. The positions considered are equities and securitised products, commodities, FX and rates. The stress impact is modelled by assuming sell-off against reduced prices.

Based on the results from both assessments of the impact of transition risk and physical risk, the institution designates a regulatory buffer for C&E risk for market risk. Results are further used for dynamic balance sheet planning and portfolio management.

5.5 Environmental risk management

Institutions that consider environmental risks beyond climate-related risks have generally started by assessing these from a high-level macro point of view following an approach based on qualitative expert judgement. Many institutions describe the general impacts of those other environmental risks on vulnerable sectors like agriculture, but often do not yet map these out with concrete transmission channels at the portfolio level or use a quantification approach. Assessment results are sometimes displayed in a traffic light red-amber-green scaling system. Only few institutions elaborate on underlying assumptions or provide detailed reasoning for their assessment.

In dealing with environmental risks, many institutions have implemented an exclusion-based approach. More advanced exclusion approaches are based on internationally recognised conventions or treaties and are also sometimes further differentiated in that some activities are only financed when the counterparty meets certain conditions (e.g. sustainability certifications) under broadly recognised standards. Some institutions have conducted assessments of the biodiversity impacts of individual projects or corporate clients, while others have started with broader portfolio-level assessments. Where concerns arose regarding the potential adverse environmental impact of the financed activities, such cases were subject to assessment, typically with specialised external support. Such project or client-based assessments also served as capacity-building exercises to better advance client and/or activity-level biodiversity risk assessments, as well as work towards biodiversity footprint calculations and a more comprehensive consideration of environmental risks beyond climate risks and their materialisation in financial risks.

This section outlines a selection of observed practices in the area of risk management for other environmental risks, in particular related to exclusion criteria, due diligence procedures and risk measurement.

5.5.1

Good practice for exclusion approaches

Nature at risk – excluding clients that conduct activities with an adverse environmental impact

Expectation 7.5

Institutions are expected to conduct a proper C&E due diligence, both at the inception of a client relationship and on an ongoing basis.

As a first step, many institutions respond to broader environmental risks by excluding from financing certain counterparties or activities that have an adverse environmental impact. In such an exclusion-based approach, institutions define in their lending policies and/or risk appetite statement certain controversial activities with which the institution will not do business and further areas of concern where business will only be done under pre-established guidelines. These controversial activities are typically in line with internationally recognised conventions and standards to prevent damage to world heritage sites, wetlands, endangered species and high conservation value forests. The table below provides an overview of observed practices in this regard.

Table 34

Non-exhaustive list of observed international treaties and certifications on environmental protection

Treaties, agreements and conventions	Industry standards and certifications
Paris Agreement	Forestry Stewardship Council (FSC)
Convention on Biological Diversity (CBD)	Roundtable on Sustainable Palm Oil (RSPO)
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Roundtable on Responsible Soy (RTRS)
Convention on the Conservation of Migratory Species of Wild Animals	Proterra Foundation
The International Treaty on Plant Genetic Resources for Food and Agriculture	International Sustainability & Carbon Certification (ISCC)
Convention on Wetlands ("Ramsar Convention")	Cefetra's Certified Responsible Soya (CRS)
UNESCO World Heritage Convention (WHC)	Programme for the Endorsement of Forest Certification (PEFC)
UN Convention on the Law of the Sea	Pew Charitable Trust Arctic Atandards
Cartagena Protocol on Biosafety to the Convention on Biological Diversity	Protection of the Arctic Marine Environment (PAME) ISO for Arctic Operations
Council Directive on the conservation of natural habitats and of wild fauna and flora	ISO for Arctic Operations
	IPIECA-OGP Biodiversity Working Group
	IPIECA Water Management Good Practice Guidelines
	Standards for hydraulic fracturing of the American Petroleum Institute
	International Council on Mining and Metals (ICMM)
	International Cyanide Management Code
	Rainforest Alliance

One institution developed a set of criteria for its commercial activities to avoid involvement with entities that have a negative impact on biodiversity and ecosystems and a set of criteria to support investments and finance projects that contribute to protecting biodiversity and strengthening ecosystems. The institution assesses potential counterparties against these criteria. For example, companies must fulfil certain criteria such as sustainability certification, provide evidence of no illegal activities or meet certain thresholds in order to be eligible for financing. In some cases,

investment in areas of concern with the goal of reducing the negative environmental impact of these activities (e.g. dismantling of coal plants or maintaining the safety of a power plant) are still financed on a case-by-case basis. The institution checks for potential environmental risks in its client onboarding process, periodic know-your-client reviews or in the transaction due diligence process. Identified risks are referred to the institution's environmental risk unit, which decides on approval or rejection (see also the subsequent good practice).

5.5.2

Good practice for due diligence

Not up to standard – addressing environmental risks in client due diligence

Expectation 7.5

Institutions are expected to conduct a proper C&E due diligence, both at the inception of a client relationship and on an ongoing basis.

Several institutions have implemented risk management practices focused explicitly on other environmental risk drivers. One institution has implemented a classification system to identify and monitor which clients are most exposed to other environmental risk drivers, such as biodiversity loss, water stress and pollution. The approach is integrated in the institution's credit policy and loan origination framework. First and second lines of defence are trained specifically on how to integrate the approach in credit decision-making. The approach taken consists of the following steps:

1. Development of sector-level heatmaps

First, the credit officer will assess the level of risk for the client at sector level. A heatmap is developed to classify the level of environmental risk of exposures at sub-sector level. The risk levels are retrieved from multiple third-party providers of environmental risk ratings. The most conservative risk rating is taken as the lead rating for the risk score. The score can be revised downwards based on internal risk assessments that are updated on a semi-annual basis.

Table 35

Stylistic example of a heatmap

Sector	Sub-sector	Biodiversity score	Pollution score	Water stress score	Overall environmental score
Agriculture	Dairy	High	Medium	Medium	High
	Flowers	Medium	Medium	High	High
	Fruit and vegetables	Medium	Low	High	Medium
	Grain and oil seeds	Low	Low	Low	Low
	Livestock	High	Low	Low	Medium

2. Client-level due diligence

Subsequently, clients with high risk (sub-)scores are subject to dedicated due diligence. For each of the environmental risk dimensions, specific risk factors are defined that the credit officer is asked to determine for its client. Furthermore, qualitative due diligence questions are established that allow the credit officer to form

a view of the possible impact of risk drivers on the revenue-generating capacity and cost structures of the client (see table below). This due diligence is a mandatory step that must be documented in the credit file and loan origination documentation.

Table 36

Assessment guide for environmental due diligence of medium/high-risk clients

Environmental risk driver	Relevant risk factors	Due diligence topics	
Biodiversity loss	- Operations in areas vulnerable to biodiversity change - Operations affecting endangered species - Implementation of deforestation policy	Revenues	Dependency on natural capital assets, ecosystems and biodiversity? Impact of depletion of natural capital assets, ecosystems and biodiversity on client's revenue-generating capacity (e.g. reduction in crop yields)? Public sentiment around biodiversity and how this may impact product demand.
		Expenses	Dependency of client's supply value chain on natural capital assets, ecosystems and biodiversity (e.g. in procurement and other contracts)? Are supply chain disruptions likely? Impact of biodiversity issues on client's "local licence to operate" or its access to market capital?
Pollution	- Emission of air/water/land pollutants (weight in tonnes) - Production, use or disposal of chemicals	Revenues	Are consumer preferences shifting towards less polluting alternatives (e.g. trends related to reusable/bio-based materials in view of plastic pollution)?
		Expenses	Compliance with legal obligations on pollution prevention? Any instances of legal non-compliance reported? Pollution-related regulatory restrictions, tax changes or even bans (e.g. ban on single-use plastics, introduction of more stringent emission standards). Future needs to invest in pollution control equipment that yield significant impact on CAPEX?
Water stress	- Exposure to areas of high water stress - Water consumption intensity	Revenues	Are consumer preferences shifting towards less water-intensive options? How sensitive are consumers to prices in this market (assuming that rising water resource costs are priced into products)?
		Expenses	Exposure to the risk of water scarcity either directly as a source of input, or indirectly (e.g. as used for cooling, heating, transport, cleaning, etc.) or through water-dependent supply chains? Any national or regional water-discharge standards that must be met? If not, does the client have a standard policy on its discharges?

3. Credit decision and risk mitigation

On completion of the environmental risk assessment, the outcome of the environmental risk assessment is integrated in the general credit assessment and decision-making process. For high-risk clients with poor due diligence results, the credit officer may decide to give a negative credit decision. In other cases, a positive credit decision with specific conditions may be given. This conditionality could be the placement on a watchlist with intensified monitoring and/or the collection of specific environmental risk data needed to form more complete view of the risks for the client.

5.5.3

Good practice for risk measurement

The Achilles heel – portfolio foot-printing to assess impact on biodiversity

Expectation 7.3

Institutions are expected to adequately quantify the climate-related and environmental risks that the institution is exposed to.

One institution identifies biodiversity as one of the three pillars of its sustainability policy. The policy is based on globally recognised treaties and conventions, such as the Convention on Biological Diversity and the Sustainable Development Goals of the United Nations. The institution formulates a low risk appetite for environmental risks that could lead to financial or reputational damage for the institution.

The institution also adopts a strategic target to have a net positive impact on biodiversity with its financing and investment activities in the medium term. It is a member of the open Partnership for Biodiversity Accounting Financials (PBAF) that provides guidance to financial institutions on biodiversity impacts and developed a methodology that combines a quantitative footprint calculation and a qualitative analysis. The net biodiversity footprint of the institution is calculated considering the negative impact, avoided negative impact and positive impact on biodiversity of all loans and investments. The result is expressed as a number of hectares where all biodiversity is lost. The impact mapping of investment categories against biodiversity impact categories and the identification of investments in companies that are highly dependent on biodiversity allow for targeted action. The institution estimated its net biodiversity impact and set a specific reduction target, which is translated into a quarterly risk indicator of improvement in the biodiversity impact. A yearly target of impact reduction is set and monitored quarterly by the social impact committee, which is headed by the Chief Risk Officer.

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For specific terminology please refer to the [SSM glossary](#) (available in English only).

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