



EUROPEAN CENTRAL BANK

BANKING SUPERVISION

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

BANKENTOEZICHT

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Contents

Executive summary	2
1 Introduction	6
1.1 Management and supervision of climate-related and environmental risks	6
1.2 Organisation of the assessment	7
2 The state of climate-related and environmental risk management in the banking sector	10
2.1 Overview of institutions' practices and plans	10
2.2 Main trends in current practices	11
2.3 Main trends in implementation plans	13
2.4 Institutions' views on the materiality of risks	15
3 Business models	18
3.1 Observations from the assessment	18
3.2 Good practices	20
4 Governance and risk appetite	23
4.1 Observations from the assessment	23
4.2 Good practices	26
5 Risk management	33
5.1 Observations from the assessment	33
5.2 Good practices	38
6 Disclosures	45
6.1 Observations from the assessment	45
6.2 Good practices	46
7 Conclusions	48

Executive summary

In the first ever exercise of its kind, the European Central Bank (ECB) comprehensively assessed the state of climate-related and environmental (C&E) risk management in the banking sector. In its Guide on climate-related and environmental risks published in November 2020, the ECB set out 13 supervisory expectations for institutions with a view to addressing these risks, when formulating and implementing their business strategy and their governance and risk management frameworks, and to become more transparent by enhancing their C&E risk disclosures. The ECB requested 112 significant institutions (hereinafter “institutions”) to conduct a self-assessment of their current practices against the 13 supervisory expectations and to submit implementation plans detailing how and when they would bring their practices into line with the Guide. The ECB has assessed these practices and plans to monitor the progress made as well as to identify shortcomings on an institution-by-institution basis.

None of the institutions are close to fully aligning their practices with the supervisory expectations. The supervisory assessment covered 112 Single Supervisory Mechanism (SSM) institutions with combined total assets of €24 trillion. Some of those institutions have already taken considerable steps towards adapting their practices to reflect C&E risks, but most are still in the early stages of development. Institutions are aware of this, as they themselves deem 90% of their reported practices to be only partially or not at all aligned with the ECB’s supervisory expectations. They have been candid about their need to improve their management and disclosure of C&E risks.

The ECB recognises that the challenges linked to the integration of C&E risks into strategies, governance and risk management arrangements are constantly evolving. Therefore, the ECB is committed to continuing its dialogue with the institutions so that they keep on strengthening their management of C&E risks. This report is a key supervisory effort to share observations and good practices that illustrate avenues for aligning institutions’ practices with the supervisory expectations

Virtually all institutions that performed a thorough materiality assessment expect C&E risks to have a material impact on their risk profile in the coming three to five years. Roughly half of the institutions expect C&E risks to have a material impact in the short-to-medium term. They view credit risk, operational risk and business model risk as being most sensitive to C&E risk drivers. Notably, the institutions that did not identify as being materially exposed to C&E risks were those which either did not conduct a materiality assessment or performed one with significant shortcomings.

While steps are being taken to adapt policies and procedures, few institutions have put in place C&E risk practices with a discernible impact on their strategy and risk profile. Management bodies are for example increasingly taking formal responsibility for the management of C&E risks (Table 1). However, in most cases, institutions have not developed the relevant risk reports for their management bodies

to enable them to exercise this responsibility comprehensively. Few institutions have made any effort at all to take stock of the type of data they would need in order to identify and report internally on C&E risks. Similarly, more than half of institutions have described C&E risks in their risk inventory, but less than one-fifth have included dedicated key risk indicators on C&E risks in their risk appetite statement. Over half of institutions have no concrete actions planned to embed C&E risks in their business strategy. Conversely, some institutions have started measuring and monitoring the alignment of their portfolios, defining indicators and considering how to both align their financing with the Paris Agreement while avoiding an excessive build-up of transition risks.

Table 1
Overview of institutions that have integrated C&E risks into selected practices

Section	Expectation (1)	Selected practices (2)	Level of integration (3)
Business models	1.1.	The integration of C&E risks in the systematic monitoring of the business environment	39%
	2.1.	The use of C&E-related scenario analysis for the purpose of strategy setting	11%
	2.2.	The integration of C&E risks in business strategy by setting key performance indicators	25%
Governance and risk appetite	3.1.	The integration of C&E risks in the roles and responsibilities of the management body	43%
	6.3.	The integration of C&E risks into the risks reports to the management body	14%
	4.2.	The integration of key risk indicator(s) on C&E risks in the risk appetite statement	17%
	6.1.	The development of an approach to identify C&E data needs and to overcome gaps	7%
Risk management	8.1.	The integration of C&E risks in credit risk sector lending policies	46%
	8.2.	The integration of C&E risks in credit risk classification procedures for debtors	28%
	9.1.	The assessment of the impact of C&E risks on the continuity of its operations	50%
	10.	The integration of C&E risks into the transaction due diligence of the investment process	11%
	11.	The conduct of an (ad-hoc) C&E-related stress test or sensitivity analysis	23%
Disclosures	13.1.	The specification of the means and frequency of disclosing C&E risks in disclosure policies	6%

Source: Supervisory assessment based on institutions' responses to the request to perform a self-assessment and to develop implementation plans in the light of the ECB's Guide on climate-related and environmental risks.

Notes: (1) This column refers to the expectations set out in the ECB Guide under which the practices fall. (2) This overview of selected practices illustrates relevant trends across the sector. It should not be interpreted as suggesting a prioritisation from the supervisory point of view. (3) This is the percentage share of the 112 institutions that have integrated C&E risks into the corresponding practices.

Most institutions have a blind spot for physical risks and other environmental risk drivers, such as biodiversity loss and pollution. While institutions' materiality assessments demonstrate that both physical and transition risks are as often found to be material, their risk management practices for physical risks are less advanced than for transition risk. Institutions have generally started with collecting data and developing capabilities for transition risks. Similarly, only a handful of institutions have started taking into account other environmental risk drivers, such as biodiversity loss and pollution. For virtually all institutions, such other environmental risks are still a blind spot.

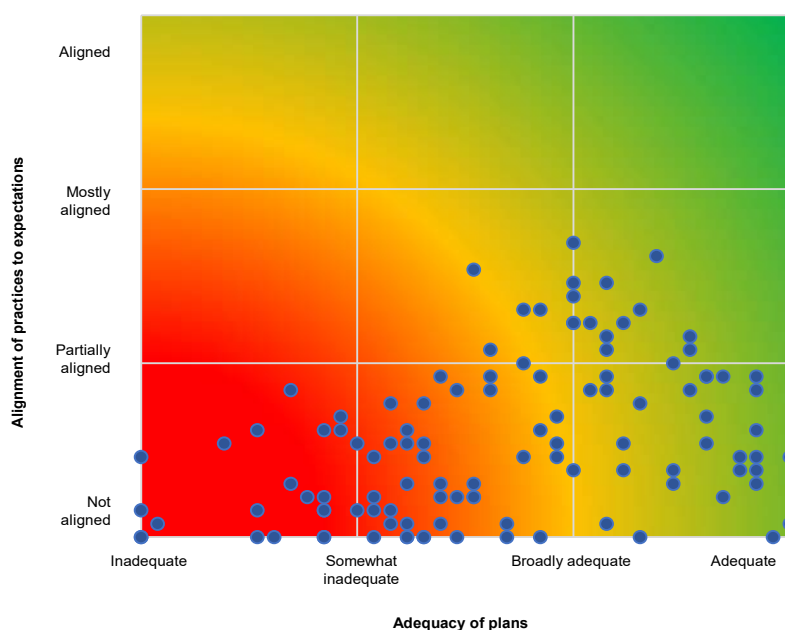
The ECB identified a set of good practices across different expectations that originated from institutions spanning a range of business models and sizes.

The good practices range from strategy-setting procedures to specific qualitative and quantitative indicators in risk appetite statements, and from materiality assessments to credit risk management. Across the board, the good practices demonstrate the ability of institutions to develop relevant risk management capabilities for the sound, effective and comprehensive management of C&E risks. They also demonstrate the importance of taking a strategic approach, especially in areas where data and methodological gaps are perceived to hinder the full implementation of the expectations in the short term. A selection of such practices is described in this report for illustrative purposes.

Virtually all institutions developed implementation plans to further improve their practices, but the quality of those plans varies considerably. Institutions were requested to develop implementation plans to improve their practices. These plans should clearly outline a road map with verifiable milestones and describe a robust process for their implementation and monitoring. The ECB reviewed the quality of these plans and assessed in particular whether they address existing gaps in the institutions’ practices. The quality of the plans submitted varied considerably across the institutions (Figure 1). Some institutions provided short and unsubstantiated answers to the questionnaire, while others submitted large project documents detailing all the actions planned over time.

Figure 1
The state of C&E risk management in the banking sector in terms of institutions’ alignment with expectations and the adequacy of their plans to advance practices

(the y-axis describes the level of alignment of 112 institutions’ practices to the supervisory expectations set out in the ECB Guide; the x-axis describes the level of adequacy of 112 institutions’ implementation plans to address gaps in their practices)



Source: Supervisory assessment based on institutions’ responses to the request to perform a self-assessment and to develop implementation plans in the light of the ECB’s Guide on climate-related and environmental risks.
Note: Weighted average scores are plotted for the 13 supervisory expectations.

All in all, institutions have started paving the way, but the pace of progress remains slow in most cases. The expected completion timelines submitted to the ECB show that many institutions will not have practices in place that are aligned with the ECB supervisory expectations in the near future. More than half of the institutions will not have completed their plans by the end of 2022 with a subset of those, amounting to roughly one-fifth, not having any short-term deliverables in place. These institutions may not be able to soundly, effectively and comprehensively manage C&E risks that they are exposed to.

The ECB expects all institutions to take decisive action to address the shortcomings set out in a dedicated supervisory feedback letter. A supervisory dialogue with each institution was conducted by Joint Supervisory Teams between August and September 2021. Accordingly, all institutions received a feedback letter outlining the main shortcomings as well as an overview of peer benchmarking. For some institutions, a qualitative requirement may be communicated as part of the 2021 Supervisory Review and Evaluation Process (SREP). Owing to the constant evolution of C&E risk management, the ECB is aware that data and methodological gaps may make it difficult to fully implement the supervisory expectations in some cases. The ECB expects institutions to adopt a strategic approach and to take intermediate steps as appropriate.

1 Introduction

1.1 Management and supervision of climate-related and environmental risks

The European Central Bank (ECB) views climate-related and environmental risks (C&E risks) as key risk drivers for the banking sector.¹ As drivers of existing risk categories, including credit, market and operational risk, C&E risks will have a widespread impact across sectors and geographical areas. The ECB is of the view that timely and decisive action is needed by all institutions to ensure the sound, effective and comprehensive management, as well as the disclosure, of these risks.

The ECB published its Guide on climate-related and environmental risks (hereafter the “Guide”) in November 2020. It outlines the ECB’s understanding of the safe and prudent management of C&E risks under the current prudential framework. The Guide describes how the ECB expects institutions to consider C&E risks when formulating and implementing their business strategy and their governance and risk management frameworks, including stress testing (see Box 1). It further explains how the ECB expects institutions to become more transparent by enhancing their C&E risk disclosures.

The ECB announced a follow-up to the Guide in three concrete steps.² In early 2021 the ECB asked institutions to conduct a self-assessment in the light of the supervisory expectations outlined in the Guide and to draw up implementation plans to advance their management of C&E risks. In 2022 the ECB will conduct a thematic review of institutions’ C&E risk management practices and a supervisory stress test as it gradually integrates C&E risks into its Supervisory Review and Evaluation Process (SREP) methodology. This integration will eventually influence institutions’ Pillar 2 requirements.

This report sets out observations from the supervisory review³ of the self-assessments and the implementation plans for the management and disclosure of C&E risks of 112 Single Supervisory Mechanism (SSM) significant institutions. It provides a picture of the current state and direction of travel of C&E risk management in the banking sector, in the light of the ECB’s expectations. The report also shares several good practices observed by the ECB. It should be noted that these good practices merely serve as an illustration and are not necessarily replicable, nor do they necessarily ensure alignment with supervisory expectations. They may have been amended and/or augmented by comparable practices of other institutions for illustrative purposes. The ECB emphasizes 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

¹ See “ECB Banking Supervision: Assessment of risks and vulnerabilities for 2021”.

² See the ECB press release, “ECB publishes final guide on climate-related and environmental risks for banks”, 27 November 2021.

³ For details on the organisation of the underlying assessment, see Section 1.2.

regulatory framework and, more particularly, in the Capital Requirements Regulation (CRR) and Capital Requirements Directive (CRD IV), as further specified by European Banking Authority Guidelines.

1.2 Organisation of the assessment

The supervisory assessment was based on two questionnaires and supporting documentation provided by the institutions. A first questionnaire was collected in February 2021 in which institutions were also called on to perform a self-assessment of their current practices against the expectations set out in the ECB's Guide, including assessment practices regarding the materiality of exposures to C&E risks. A second questionnaire was collected in May 2021. This time institutions were also asked to inform the ECB of their planned actions and implementation timelines to advance the management of C&E risks to meet the supervisory expectations in the short-to-medium term. The ECB received a wide variety of supporting documentation, ranging from risk appetite statements to business strategies and lending policies to risk analyses. The supervisory assessment was based on these questionnaires and underlying documentation, covering 129 assessment objectives. The observations outlined in this report are based on the situation as at the end of July 2021.

The assessment covered significant institutions at highest level of consolidation as at 1 January 2021. It focused on their practices at the highest level of consolidation for European banking supervision conducted through the SSM. For large host institutions, the assessment also took into account documents applicable at the international consolidation level, to the extent that they were applicable to the SSM subsidiaries.

Table 2

Structure of the sample by country and balance sheet size

Country	AT	BE	BG	CY	GE	EE	ES	FI	FR	GR	IE	IT	LT	LU	LV	MT	NL	PT	SI	Total
> €500 billion in assets					3		3	1	5			2					2			16
€100 billion - €500 billion in assets	2	2			5		1	1	2		3	4					3			23
€30 billion - €100 billion in assets	2	3			13		6	1	3	4	2	4		3			2	3		46
< €30 billion in assets	3	1	1	3		3			1			1	3	2	3	3			3	27
Total number of significant institutions	7	6	1	3	21	3	10	3	11	4	5	11	3	5	3	3	7	3	3	112

Source: Supervisory assessment in the light of the ECB's Guide on climate-related and environmental risks / ECB's list of supervised entities (as of 1 January 2021)

The SSM's Joint Supervisory Teams discussed institutions' practices and implementation plans during the supervisory dialogues. These dialogues

focused on the areas where institutions' practices diverged from the expectations set out in the Guide, identified the main shortcomings and provided an overview of peer benchmarking. Following the supervisory dialogues, which were conducted between August and October 2021, all institutions received a detailed feedback letter outlining the key findings of the assessment and requesting them to take decisive action to address the identified shortcomings. For some institutions, the ECB will impose a qualitative supervisory measure as part of the 2021 SREP.

ECB Banking Supervision provided supervisory feedback to significant institutions on the observed shortcomings. In 2022, in addition to the climate risk stress test, the ECB will conduct a thematic review aimed at comprehensively assessing the incorporation of these risks into the institutions' strategy and their governance and risk management frameworks – and into their credit, market and operational risk management processes in particular. In this context, it will also measure the progress achieved and monitor the implementation of the plans submitted since the 2021 assessment. The ECB will also give greater prominence to environmental risks beyond climate-related risks, such as the risks of biodiversity loss and pollution.

Box 1

Overview of the ECB's supervisory expectations as outlined in the ECB's Guide on climate-related and environmental risks

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.
2. When determining and implementing their business strategy, institutions are expected to integrate climate-related and environmental risks that have an impact on their business environment in the short, medium or long term.
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.
4. Institutions are expected to explicitly include climate-related and environmental risks in their risk appetite framework.
5. Institutions are expected to assign responsibility for the management of climate-related and environmental risks within the organisational structure in accordance with the three lines of defence model.
6. For the purposes of internal reporting, institutions are expected to report aggregated risk data that reflect their exposures to climate-related and environmental risks with a view to enabling the management body and relevant sub-committees to make informed decisions.

7. Institutions are expected to incorporate climate-related and environmental risks as drivers of existing risk categories into their existing risk management framework, with a view to managing and monitoring these drivers over a sufficiently long-term horizon, and to review their arrangements on a regular basis. Institutions are expected to identify and quantify these risks within their overall process of ensuring capital adequacy.
 8. In their credit risk management, institutions are expected to consider climate-related and environmental risks at all relevant stages of the credit-granting process and to monitor the risks in their portfolios.
 9. Institutions are expected to consider how climate-related events could have an adverse impact on business continuity and the extent to which the nature of institutions' activities could increase reputational and/or liability risks.
 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.
 11. Institutions with material climate-related and environmental risks are expected to evaluate the appropriateness of their stress testing with a view to incorporating these risks into their baseline and adverse scenarios.
 12. Institutions are expected to assess whether material climate-related and environmental risks could cause net cash outflows or depletion of liquidity buffers and, if so, incorporate these factors into their liquidity risk management and liquidity buffer calibration.
 13. For the purposes of their regulatory disclosures, institutions are expected to publish meaningful information and key metrics on climate-related and environmental risks that they deem to be material, with due regard to the [European Commission's Guidelines on non-financial reporting: Supplement on reporting climate-related information](#).
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2 The state of climate-related and environmental risk management in the banking sector

2.1 Overview of institutions' practices and plans

Institutions are paving the way but there is still a long way to go to fully align their practices with the supervisory expectations. Some institutions – mainly the largest of the significant institutions, have made considerable progress in adapting their practices, but most institutions are generally only partially aligned with expectations (Figure 2, bottom row). Institutions have started laying the groundwork for reflecting C&E risks in their processes, but few institutions have incorporated these risks into their risk management practices and/or explicitly integrated C&E risks into their strategic planning or risk mitigation processes. If institutions continue at this pace, many will not align their practices with the supervisory expectations and may not be able to soundly, effectively and comprehensively manage climate-related and environmental risks in the near future.

Nevertheless, almost all institutions have developed implementation plans to advance their practices. The ECB views it as important that such plans clearly outline a road map with verifiable milestones and establish a robust process for their implementation and monitoring. In many cases, institutions have made substantial efforts to develop plans that aim to improve their practices and have taken intermediate steps when full implementation is subject to data and/or methodological gaps.

The quality of the implementation plans varies considerably across the institutions. The plans have been assessed by considering whether they address existing gaps in the institutions' practices, as identified when comparing the outcome of the self-assessment exercise with the supervisory expectations. For instance, where an institution does not currently perform a materiality assessment of C&E risks, checks were made to determine whether its implementation plan includes such an assessment. This approach was adopted to ensure that the plans reflect a comprehensive consideration of C&E risks in a timely fashion. The supervisory assessment has shown that the adequacy of the implementations plans in terms addressing existing gaps in their practices varies considerably across institutions:

- Only one-third of institutions have plans in place that are at least broadly adequate and thus address most of the gaps that currently exist in their business strategy, governance, risk management and disclosure arrangements (Figure 2, right-hand column).
- Roughly two-thirds of institutions have failed to tailor their plans sufficiently to their specific situation; many plans lack operational details on how the deliverables will actually be produced, do not contain interim milestones, and/or

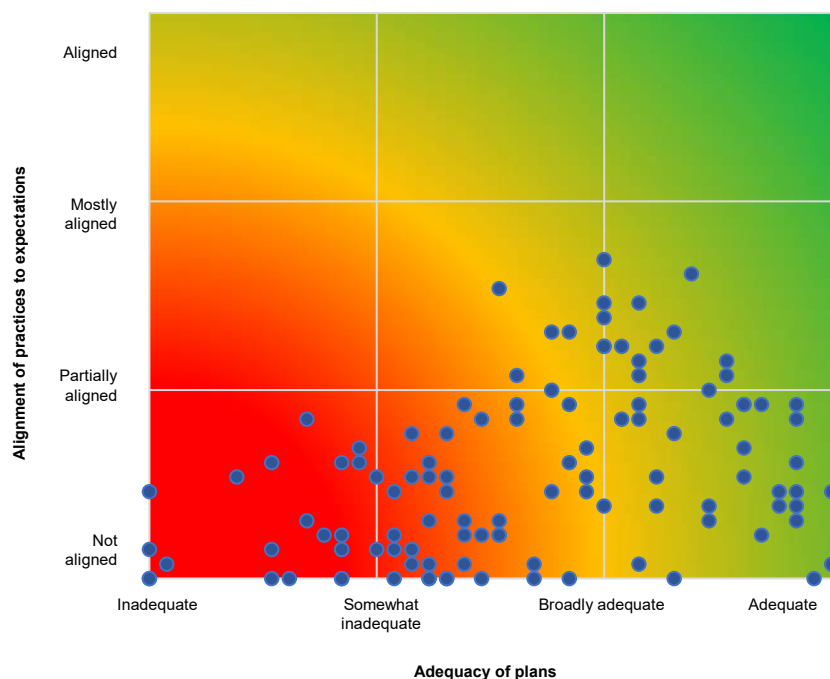
focus on either transition risk or physical risks (Figure 2, left-hand and middle columns).

There is a group of institutions that is significantly lagging. One-fifth of institutions have inadequate or somewhat inadequate plans, suggesting that their C&E risk practices will continue to be not aligned with the supervisory expectations for the time being (Figure 2, bottom-left square). In other words, these institutions have significant gaps in their current practices but do not have credible plans to ensure sound and comprehensive management of C&E risks in the foreseeable future.

Figure 2

How institutions' practices align with the expectations, mapped against the adequacy of their plans to advance those practices

(the y-axis describes the level of alignment of 112 institutions' practices to the supervisory expectations set out in the ECB Guide; the x-axis describes the level of adequacy of 112 institutions' implementation plans to address gaps in their practices)



Source: ECB's supervisory assessment.
 Note: Weighted average scores are plotted for the 13 supervisory expectations.

2.2 Main trends in current practices

Institutions have started to adapt their practices in line with the ECB's supervisory expectations. Institutions' practices have been assessed against each of the 13 supervisory expectations.

Institutions have focused on adapting their governance and policies, placing less emphasis on risk identification and mitigation. Across the board, institutions have started incorporating C&E risks into their lending policies and adapting their

governance structures to take into account the responsibility for managing these risks. However, when it comes to the integration of C&E risks into the risk management framework as part of their ICAAP and ILAAP – from risk identification to monitoring and mitigation – only a handful of institutions have taken significant steps. Those institutions have, for instance, developed key risk indicators and risk classifications that consider C&E risks comprehensively.

Most progress relates to the management body, risk appetite and operational risk management practices. More than 50% of institutions are at least partially aligned with those expectations. Those institutions have assigned responsibility for managing C&E risks to the management body and many have incorporated explicit oversight of the integration of those risks across their strategy and risk management framework. Regarding risk appetite, most institutions have defined C&E risks in their risk inventory. Less than one-fifth of institutions have subsequently also developed key risk indicators to monitor C&E risks. Only a handful of institutions have set limits on those indicators. As for operational risk, many institutions have also integrated physical risks into their business continuity plans.

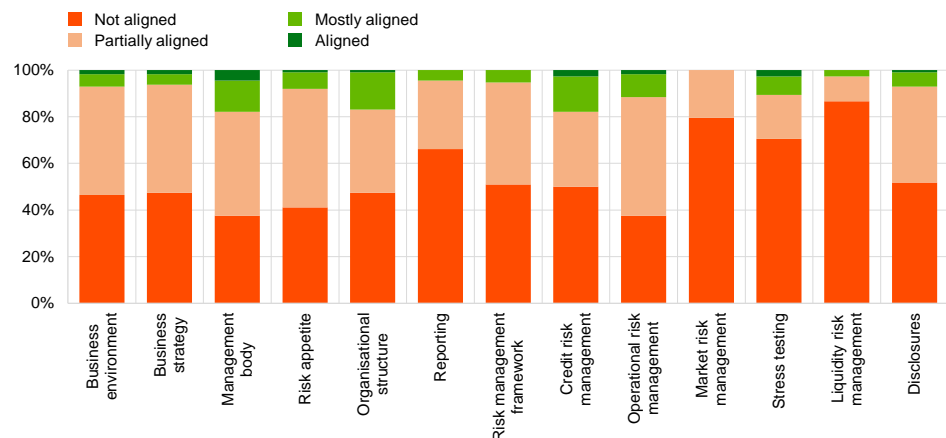
The least progress has been made in the areas of internal reporting and market and liquidity risk management, as well as stress testing. Less than one-third of institutions are at least partially aligned with those expectations. Most institutions have thus not started adapting their practices at all. Part of the explanation may be that institutions deem market and liquidity risk to be relatively less materially impacted by C&E risks (see Section 2.4).

A lack of available data is often given as a reason for insufficient progress by institutions in incorporating C&E risks. However, few of them have made any effort at all to take stock of the type of data they would need in order to identify and report internally on C&E risks.

Chart 1

Institutions' alignment with the 13 supervisory expectations set out in the ECB's Guide

(percentages)



Source: ECB's supervisory assessment.

Note: For a full description of the 13 supervisory expectations, see Box 1.

The degree of alignment with the expectations varies considerably across institutions' asset sizes, with the largest institutions performing better.

Institutions with asset bases of over €500 billion are at least partially aligned with the supervisory expectations in over 80% of cases. And in 25% of cases, they are at least mostly aligned. These institutions have already taken steps to integrate C&E risks into their risk decision-making, such as in their risk appetite statement and risk classification of exposures. More importantly, these institutions have performed an assessment of the materiality of C&E risks leading in many cases to a clearer view of why and how to adapt their practices (see also Section 2.4). Institutions with asset bases of between €30 billion and €500 billion have shown less progress overall in this regard, although some positive outliers were observed.

2.3 Main trends in implementation plans

Institutions were requested to develop implementation plans to address the gaps identified in their current practices. The quality of the plans submitted varies considerably across institutions. Some institutions provided short and unsubstantiated responses to the questionnaire, while others submitted large project documents detailing all the actions planned over time. In terms of the operationalisation of the plans, most institutions stated that the plans had been discussed and approved by the management body. However, only a subset had established formal targets for monitoring progress over time and had clearly specified and documented the resource implications of the planned actions.

The adequacy of the institutions' plans in addressing the gaps identified varies considerably across the 13 supervisory expectations. Over 60% of institutions have addressed the expectations related to the management body, organisational structure and stress testing to a reasonable degree in their plans. In particular, most plans cover the organisational integration of C&E risks across the three lines of defence. Institutions also anticipate making progress on integrating C&E risks into their stress-testing frameworks.

Operational risk management, liquidity risk management, reporting and disclosure are the areas where plans are still in the early stages of development. Less than two-fifths of institutions have developed plans that are (broadly) adequate in those areas. In particular, for operational risk, plans typically do not foresee any assessment of how many of the institutions' activities are exposed to liability and/or litigation risks driven by C&E considerations. Similarly, few plans indicate whether disclosure policies include the key considerations that underpin the materiality assessment of C&E risks, or whether institutions' financed greenhouse gas (GHG) emissions will be disclosed.

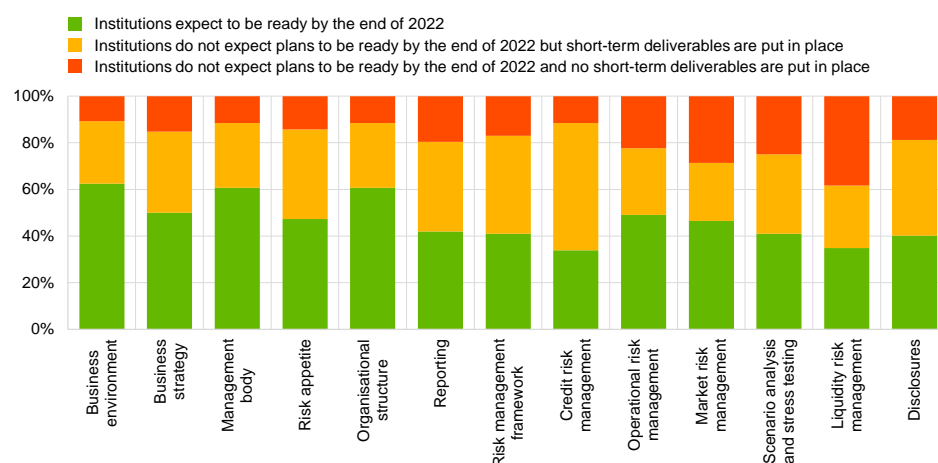
Institutions were asked to share timelines for the expected completion of their plans, covering all 13 supervisory expectations. A lack of preparation, inadequate plans and long implementation timelines were observed, which indicate that many institutions' practices will not be aligned with the regulatory framework as interpreted in the light of the supervisory expectations in the near future. For

practices related to the business environment, management body and organisational structure, roughly 60% of institutions envisage meeting the supervisory expectations by the end of 2022 (Chart 2). However, less than 35% expect their credit and liquidity risk management practices to be aligned in a timely manner. Owing to the constant evolution of C&E risk management, the ECB is aware that data and methodological gaps may make it difficult to fully implement the supervisory expectations in some cases. The ECB expects institutions to adopt a strategic approach and to take intermediate steps as appropriate by 2022.

Chart 2

The timeliness of institutions' plans across the 13 supervisory expectations set out in the ECB's Guide

(percentages)



Source: ECB's supervisory assessment.

Note: For a full description of the 13 supervisory expectations, see Box 1.

The ECB is of the opinion that institutions need to start enhancing their practices promptly in order to adequately manage and disclose C&E risks, taking into account the materiality of their exposures to these risks. The materiality assessment is institution-specific and will take into account the particular characteristics of the respective business model, operating environment and risk profile. In some cases, for instance, institutions do not plan to finalise a materiality assessment of C&E risk drivers before the end of 2023.

Institutions are not taking a sufficiently strategic approach where data and methodological gaps are perceived to hinder the full implementation of the supervisory expectations. As outlined in its Guide, the ECB expects institutions to adopt a strategic approach and to take intermediate steps as appropriate. Some institutions have already made progress in this regard, for example by developing client scorecards with a qualitative risk classification (e.g. low, medium or high) or by using proxies as key risk indicators in the risk appetite statement. However, a considerable number of institutions have longer timelines and do not plan to produce any short-term deliverables before the end of 2022. This is true for more than 20% of institutions in the areas of reporting, stress testing and market, operational and liquidity risk management (Chart 2). When accurate or complete data are unavailable, the ECB expects institutions to assess their data needs for sound

strategy-setting and risk management (also as part of their ICAAP and ILAAP), and to determine how current and future gaps will be filled, which most institutions have not done so far.⁴

2.4 Institutions' views on the materiality of risks

Institutions have shared the results from their assessments on whether C&E risks are a material risk driver of conventional risk types. The institutions' views comprise an assessment of physical risks and transition risks as material risk drivers in both the short-to-medium term and the longer term.

Roughly half of institutions deem themselves to have material exposures in both the short-to-medium term and the longer term (Chart 3). In line with the ECB's Guide, the short-to-medium term is defined as the coming three to five years, while the longer term refers to more than five years. This means that many institutions perceive C&E risks to have a material impact on their risk profile in the current business planning horizon. Consequently, it is important that institutions take timely and decisive action to set ambitious and concrete goals and timelines – including intermediate milestones – to mitigate their exposure to C&E risks in the short-to-medium term. At the same time, this also creates the need for forward-looking risk management tools that can capture longer-term risks, such as portfolio alignment approaches, and the need to monitor strategy positioning compared with science-based transition pathways.

None of the institutions that report that C&E risks are not material has an adequate materiality assessment in place. Roughly 40% of institutions either did not conduct a materiality assessment or performed one with significant shortcomings. For example, some institutions either made insufficient use of the available data to quantify the risks and did not develop (qualitative) proxies for risk drivers that are too difficult to quantify.⁵ Other institutions did not assess the risks in a sufficiently comprehensive manner and failed to include both transition and physical risk drivers or to cover all conventional risk types.

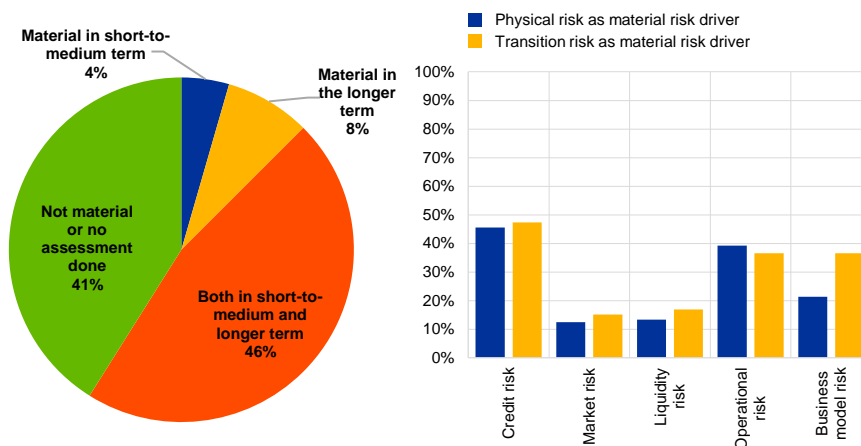
⁴ See "Patchy data is a good start: from Kuznets and Clark to supervisors and climate", keynote speech by Frank Elderson, Member of the Executive Board of the ECB and Vice-Chair of the Supervisory Board of the ECB, Frankfurt am Main, 16 June 2021.

⁵ See paragraph 74 of the "ECB Guide to the internal capital adequacy assessment process (ICAAP)", November 2018, which states that "the institution is expected to determine sufficiently conservative risk figures, taking into consideration all relevant information and ensuring adequacy and consistency in its choice of risk quantification methodologies".

Chart 3

Percentage of institutions that assessed C&E risks as material in the short-to-medium term and/or longer term, both overall (left-hand panel) and broken down by risk types (right-hand panel)

(percentages)



Source: ECB's supervisory assessment.

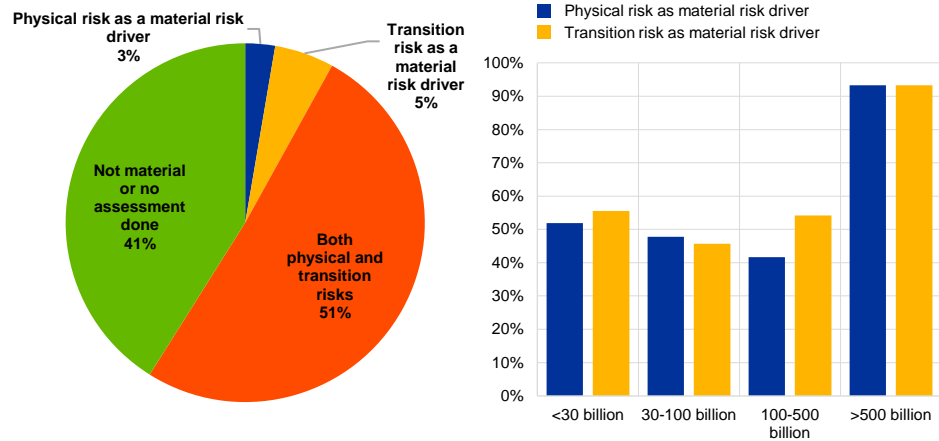
Institutions view credit risk, operational risk and business model risk to be most often materially impacted by C&E risks (Chart 4). In the short-to-medium term roughly 30% of institutions deem credit risk, operational risk and business model risk to be materially exposed to C&E risks. In the longer term for credit risk this increases to almost 50% of institutions. For market risk and liquidity risk, roughly only 10% of institutions deem C&E risks to be a material risk driver. Part of this difference is explained by the fact that institutions have generally started assessing the materiality of C&E risks for the risk categories that they are most exposed to, i.e. in most cases credit risk and operational risk. Business model risk is also in focus, as the future impacts of climate change and environmental degradation are also strategic in nature, presenting both risks and opportunities to institutions.

Over 50% of institutions deem both physical and transition risk drivers to have a material impact (Chart 4). There is only a slight difference between the assessed impact of physical risk and transition risk, signalling that institutions regard both risk drivers as material. This should be noted, as the supervisory assessment of both practices and plans has demonstrated that the institution's risk management practices for physical risk are less advanced than for transition risk.

Chart 4

Percentage of institutions that assessed physical and transition risk drivers as material, both overall (left-hand panel) and broken down by institutions' asset sizes (right-hand panel)

(percentages)



Source: ECB's supervisory assessment.

Almost all institutions with asset bases of over €500 billion view both physical risks and transition risk as material risk drivers. The same is true for roughly half of institutions with smaller asset bases. This difference is in part explained by the fact that fewer institutions with asset bases smaller than €500 billion have performed a materiality assessment of C&E risks. It is important to emphasise that asset size is not necessarily correlated with exposure to C&E risks and all institutions are expected to perform a sound and comprehensive materiality assessment.

3 Business models

3.1 Observations from the assessment

Institutions have started to incorporate C&E risks into their business environment and strategy-setting arrangements. Many institutions have integrated C&E risks into related procedures and policies. For instance, some have described in their procedures how climate change and environmental degradation could potentially impact the business environment of the institution. However, in terms of quantification of the impact on the business environment and actual integration into the strategy-setting framework, most institutions have so far made limited progress.

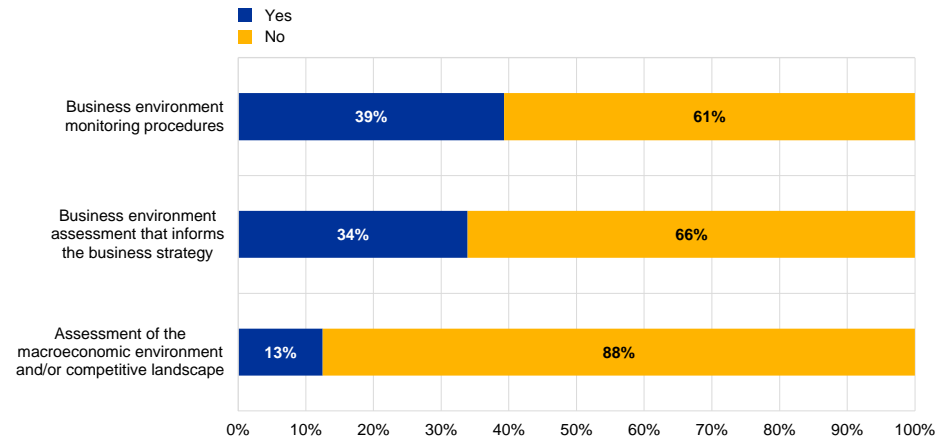
Roughly two-fifths of institutions have integrated C&E risks into their regular monitoring of the business environment. This was done using either a qualitative or quantitative approach, for example as part of their regular materiality assessment of emerging risks or through management board discussions. Most of these institutions have also described how the impact of C&E risks on the business environment informs the business strategy process (Chart 5). For example, some institutions have assessed the impact that current and future environmental policies would have on their clients and, consequently, how these policies would have an impact on the institutions in their role as finance providers. This assessment, in turn, informs the institutions' strategic decision-making regarding expected growth markets.

However, in most cases the concrete impact of C&E risks on institutions' macroeconomic environment or competitive environment has not yet been assessed. Roughly one in ten of the institutions analyse the effect of C&E risks on their macroeconomic and competitive environment (Chart 5). Generally, institutions do not yet assess how C&E risks may impact macroeconomic variables, such as GDP, employment and housing prices. Similarly, only a handful of institutions have evaluated how climate change and environmental degradation are changing market dynamics that influence the competitive landscape. For instance, some institutions have performed sector studies on how both transition risk and physical risks may influence competitive dynamics in the coming years.

Chart 5

Percentage of institutions that integrate C&E risks into selected processes related to the business environment

(percentages)

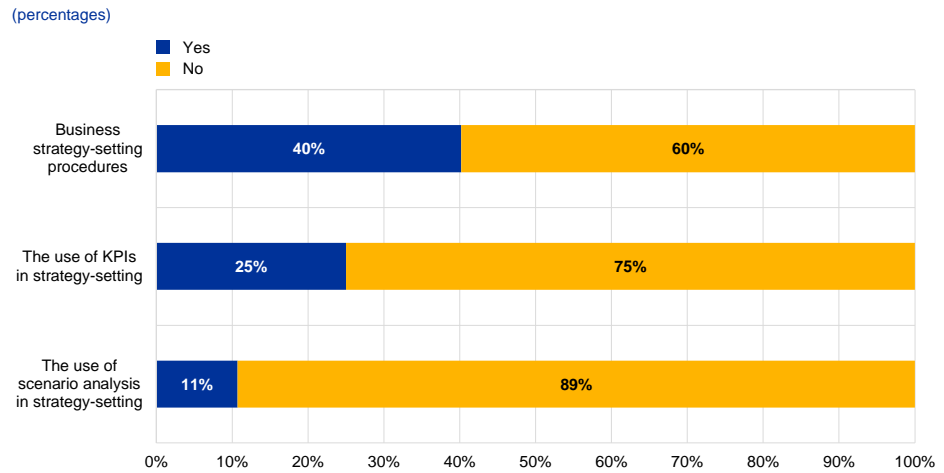


Source: ECB's supervisory assessment.

In terms of the business strategy-setting, less than one-quarter of the institutions have key performance indicators (KPIs) in place and even fewer conduct scenario analyses. Roughly two-fifths of institutions have integrated C&E risks into their strategy-setting procedures. However, only a subset of these institutions has set KPIs to support the integration of C&E risks into their strategy. For example, some institutions have set institution-wide targets for reducing the carbon footprint of their portfolios, while other institutions have assigned a strategic priority to sectors with high adaptability to a lower-carbon and more environmentally sustainable economy. Even fewer institutions conduct scenario analyses, but this tool is particularly useful in the context of C&E risks given the uncertainty associated with the future course of climate change and society's response to it. Some institutions have developed forward-looking portfolio alignment approaches to assess the longer-term risks associated with transition pathways. In some cases, institutions employing alignment approaches identified actions to be implemented in the current strategic planning horizon in order to mitigate the risks to their business model arising from transition trends.

Chart 6

Percentage of institutions that integrate C&E risks into selected processes related to business strategy-setting procedures



Source: ECB's supervisory assessment.

3.2 Good practices

Considering the observations above, the following practices provide examples of the inclusion of C&E risks in strategic planning and related processes. In that context, this subsection explores two examples: the first describes how some institutions apply financial and environmental materiality to strategic planning and the second looks at the use of portfolio alignment methodologies.

Good practice 1

The double materiality concept and how it feeds into strategic planning

One institution has developed practices to integrate C&E risks into its strategic planning, applying the double materiality concept of the European Commission's Guidelines on Non-financial Reporting:

- (a) to assess the impact of C&E risks on its business environment (financial materiality);
- (b) to assess the impact of the group's activities on the environment (environmental materiality).

Financial materiality

The institution assesses the impact of C&E risks on the business environment as part of the group's risk identification process on a continuous basis. This is done as follows:

- all risk types and group exposures are systematically integrated to ensure comprehensive coverage;

- the process relies on the group's risk management framework such that key committees are involved. For example, the group's risk committee that monitors the risk profile for each risk type (credit, market, operational, etc.) takes an active part in the process;
- this organisational set-up allows for a debate between risk experts and senior management on emerging risks (such as C&E risks), improves risk monitoring and ensures risk identification is conducted in a comprehensive way;
- the set-up yields a clear overview of the vulnerabilities in the group's exposures, which are broken down by business sector. These vulnerabilities are then assessed for further integration into the strategy-setting process, for example via limits and targets.

Sectoral reviews follow the risk identification process described above, to identify vulnerable sectors. The impacts on C&E risks related to the main sectors to which the bank is exposed are qualitatively assessed at short, medium and long-term horizons, while inputs from the corporate social responsibility (CSR) department are also systematically integrated to ensure a holistic view. Subsequently, the inputs collected help shape the group's climate change strategy and its overall strategic plan objectives. As a result of this process, the group has classified C&E risks as emergent and has increased its commitments to financing the economic transition towards a carbon-neutral economy.

Environmental materiality

The institution assesses the climate and environmental materiality of the group's activities and the related impacts of its strategy through a materiality matrix that is built using a bottom-up approach after extensive consultation with the group's internal and external stakeholders. In practice, the group analyses C&E topics that are related to the business activities of the group's customers and their potential impact on the group's activities. The assessment is then used for the group's strategic planning and reputational risk management.

Good practice 2

Fostering and monitoring alignment with the objectives of the Paris Agreement

One institution has defined climate-related risks as one of the key pillars of its overall strategy. The institution follows a three-step approach that integrates both physical and transition risks together with its climate risk appetite framework, as follows:

- (a) initially, the institution conducts a stocktake of the policies and processes that need to be updated to incorporate climate risk considerations. As part of this step, the institution also indicates how C&E risks affect its own operations and commits to clear improvements in specific focus areas;
- (b) second, a qualitative assessment of the climate risk impact is used to inform the institution's strategy and risk appetite for its different portfolios;
- (c) finally, the institution commits to adopting a quantitative approach based on scientific scenarios to inform its strategy and climate risk appetite.

This process results in a clear strategy to transition from the current portfolio to a portfolio aligned with the Paris Agreement goals for those sectors that are deemed to be most exposed, including

the fossil fuel, energy production, automotive, steel and aviation sectors. Importantly, the institution has incorporated this strategy into its governance framework by defining concrete key performance indicators (KPIs) that are published in annual progress reports. These KPIs cover the majority of the institution's exposures and set out goals to be achieved within a specified time frame. The annual progress report clearly outlines the methodology and the metrics used to define these indicators.

We observed other institutions that set greenhouse gas (GHG) targets and use specific tools to monitor and foster their progress with strategic implications. In terms of GHG emissions, one of the institutions that committed to achieving the "net zero" target by 2050 has established a carbon emission model, built on sustainable development scenarios from the International Energy Agency. On that basis, the model determined benchmarks defining how GHG emissions from financing portfolios must adjust over time in order to reach the net zero target by 2050. Some of these institutions used the Paris Agreement Capital Transition Assessment (PACTA) tool.

4 Governance and risk appetite

4.1 Observations from the assessment

Institutions have made significant progress on their management body and governance arrangements, but less progress on risk appetite and risk reporting. A significant share of institutions has integrated arrangements addressing C&E risks into their governance structures – both within their management body and across the three lines of defence. Regarding the collection of C&E risk data, the development of risk indicators and the subsequent internal reporting of those indicators, however, only a subset of institutions has taken meaningful action.

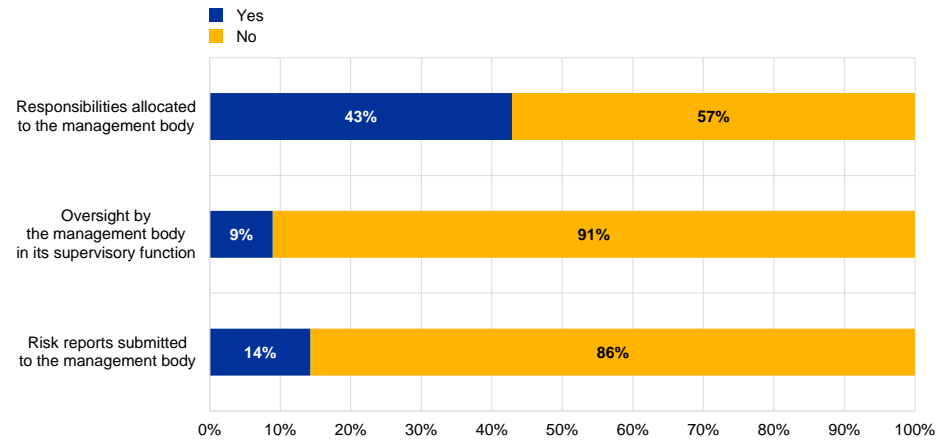
Management bodies are increasingly taking formal responsibility for the management of C&E risks. Over two-fifths of institutions have assigned responsibility to a board member or a sub-committee. The tasks involved include setting, approving and overseeing the implementation of (i) the overall business strategy and key policies; (ii) the institution's risk strategy; and (iii) the internal governance or control framework. This is an important indication that many institutions have started laying the groundwork for including oversight of C&E risks within their governance structures.

However, most management bodies are not kept comprehensively informed so they are unable to exercise this responsibility fully. Less than 15% of institutions have effectively integrated C&E risks into the formal risk reports submitted to the management body or relevant sub-committee. This could further hamper effective oversight and management, as the management body or sub-committee will not be in a position to adequately steer an institution's strategy and risk profile if the internal reports do not reflect C&E risk drivers. Furthermore, the management in its supervisory function does not provide sufficient oversight in most cases. Less than 10% of institutions provided evidence that their management body in its supervisory function performs oversight for C&E risks, for example by means of targets that are monitored over time.

Chart 7

Percentage of institutions that have integrated C&E risks into selected processes related to their management body

(percentages)



Source: ECB's supervisory assessment.

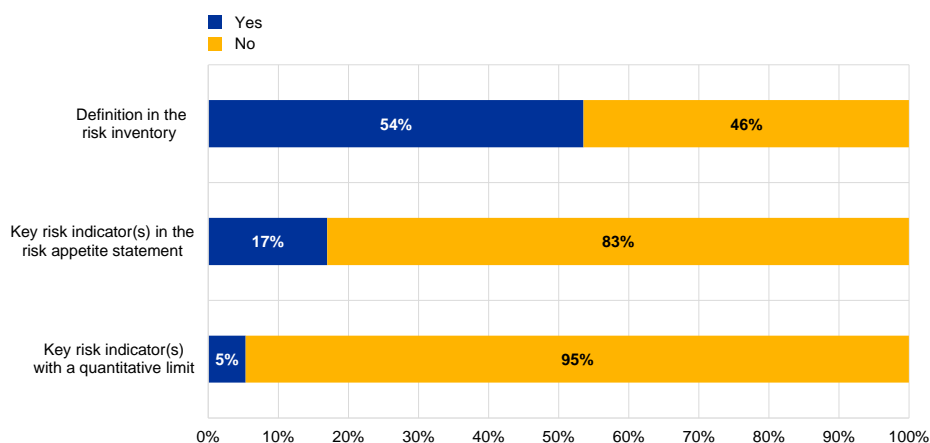
Institutions have started to integrate C&E risks into their risk identification processes. More than half have described C&E risks in their risk inventory. This shows an increasing use of internal risk taxonomies and the intention to further integrate these risks into the risk appetite statement. The ECB has observed that institutions generally either define C&E risks specifically or take a broader perspective encompassing environmental, social and governance (ESG) risks.

However, the monitoring of C&E risks to which institutions are exposed remains limited. Less than one-fifth of institutions included dedicated key risk indicators for C&E risks in their risk appetite statement. In addition, these indicators are mostly of a qualitative nature. Furthermore, the indicators often do not comprehensively cover the risks because in many instances they do not capture all relevant portfolios, risk types and/or risk dimensions. Hence, only a handful of institutions have set concrete risk limits. Such risk limits are critical for the proper control and management of the risks. Institutions have primarily focused on transition risks when developing key risk indicators.

Chart 8

Percentage of institutions that have integrated C&E risks into selected processes related to their risk appetite statement

(percentages)



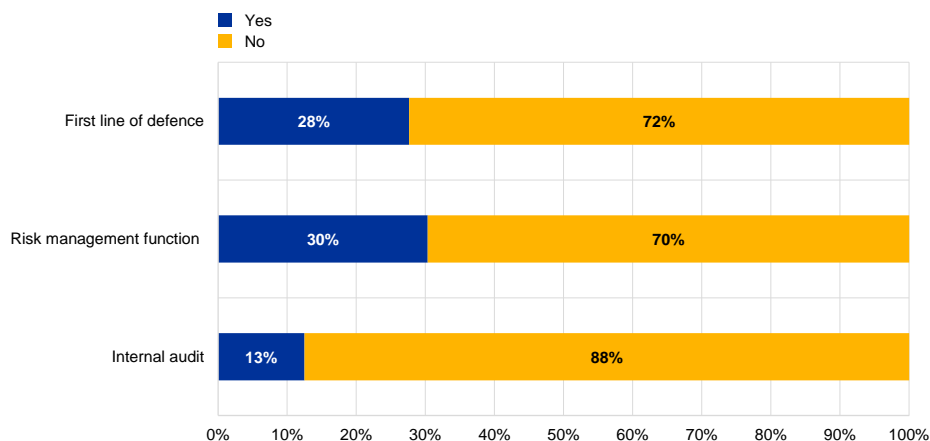
Source: ECB's supervisory assessment.

With respect to their organisational structure, institutions are increasingly integrating C&E risks into their three lines of defence. However, only 30% of institutions have explicitly defined the C&E risk-related tasks and responsibilities of the first line of defence and the risk management function. And many institutions have not yet allocated dedicated human and financial resources to the management of C&E risks. The integration of C&E risks into the third line of defence remains rare, as only about 15% of institutions have explicitly considered these risks in their internal audits or reviews. In some cases, internal audit functions have performed a dedicated audit of the compliance of institutions' practices with their internal policies and with regulations applicable to C&E risks.

Chart 9

Percentage of institutions with defined tasks and responsibilities related to C&E risks across the three lines of defence

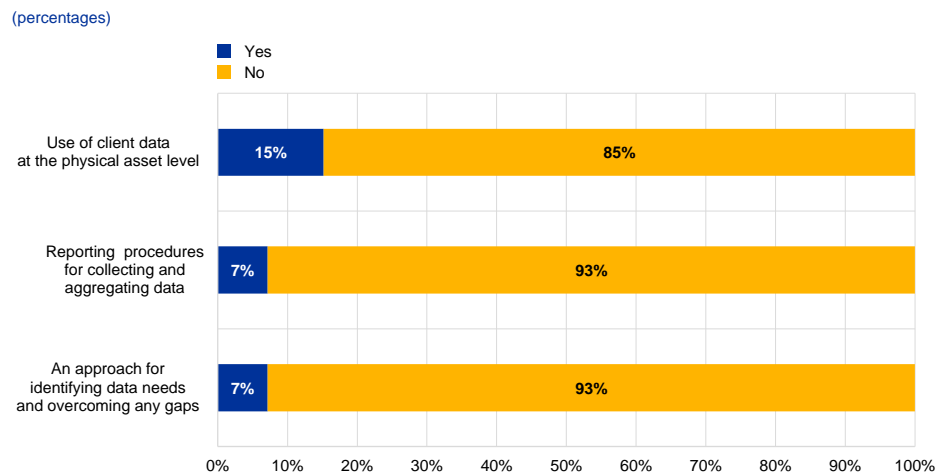
(percentages)



Source: ECB's supervisory assessment.

Most institutions do not have a comprehensive approach to the integration of C&E risk data into their risk reporting. Only 15% of institutions use client data at the physical asset level to measure C&E risks. Examples of asset level data include geospatial data on collateral positions and asset level data on greenhouse gas emissions. Even fewer institutions have implemented dedicated procedures for collecting and aggregating data on C&E risks, let alone integrated those data in their risk reporting frameworks. Owing to the distinctive characteristics of C&E risks, especially the characteristics related to their forward-looking and longer-term manifestation, institutions are expected to develop dedicated procedures to identify and internally report on C&E risks. It is therefore particularly noteworthy that only 10% of institutions have developed an approach for identifying their data needs related to C&E risks, for instance by analysing data gaps, given the institution’s existing data availability and IT systems, and assessing what external data are available publicly or via third parties.

Chart 10
Percentage of institutions that have integrated C&E risks into selected processes related to their internal reporting



Source: ECB’s supervisory assessment.

4.2 Good practices

This section details three good practices identified during the assessment. They comprise, first, the involvement of the supervisory and executive functions of the management body through specific directorates and committees; second, the use of qualitative and quantitative indicators to describe C&E risks in the risk appetite statement; and, third, the integration of C&E risks into reporting practices, from gap analysis and data collection to the IT infrastructure and reporting tools.

Good practice 3

Involving the management body in its supervisory and executive functions

One institution has implemented comprehensive governance arrangements involving the management body in its executive and supervisory functions by setting up dedicated sub-committees and departments.

The risk committee of the institution's supervisory board reviews the global risk strategy and appetite. The Risk Department draws up the climate risk management strategy and reviews sectoral policies. The Risk Department also provides an annual opinion on the institution's climate risk strategy, as well as on sectoral strategies presented in the risk committee.

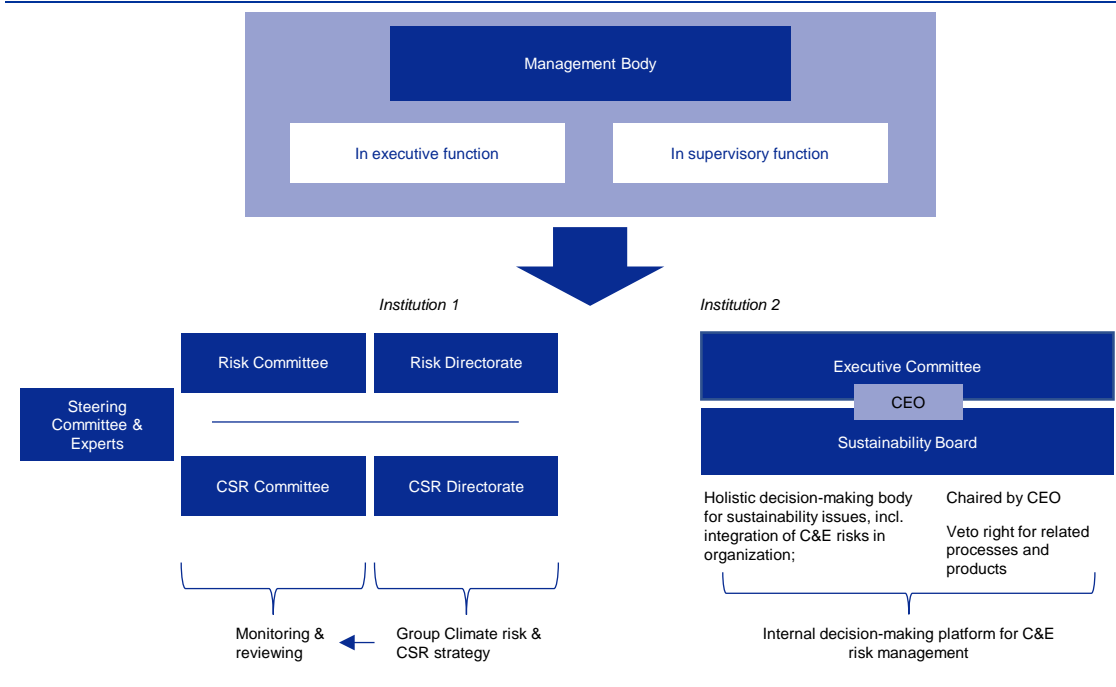
The institution has established a dedicated steering committee to ensure the consistent implementation of C&E-related commitments across the institution, supported by relevant experts. The work of the committee drives sectoral policies and portfolio allocation.

In addition, a corporate sustainability committee coordinates and monitors the deployment of the institution's strategy. The corporate sustainability department draws up group policies for sectoral corporate sustainability and designs the institution's C&E risk strategy together with the risk department. It issues opinions on C&E-relevant sectoral strategies from the perspective of the potential reputational risk and C&E impact. These opinions are formally integrated into the relevant sectoral strategies.

Another institution has established a dedicated decision-making and escalation body which also explicitly covers C&E risks. Taking decisions on strategic orientations and governance (such as the setting-up of specific committees) regarding sustainability, this dedicated body includes the institution's Chief Executive Officer (CEO) and holds a right of veto for all banking products and processes which are linked to sustainability within the institution. It meets every two months.

Figure A

Schematised examples of governance arrangements embedding the management body in its management and/or supervisory role



Good practice 4

The management of C&E risks through qualitative statements and quantitative indicators

Institutions have started integrating C&E risks into their risk appetite statements. Broadly speaking, this is done by including statements of a more qualitative nature and/or quantitative risk indicators. These more qualitative statements generally comprise targets or guidelines on the institution's willingness to take on certain risks, while risk indicators are developed based on a (partly) quantitative methodology.

Qualitative statements

Several institutions have included qualitative statements on C&E risks in their risk appetite statements:

- Some institutions have included statements on excluding or phasing out certain exposures immediately or within a certain time frame. For example:
 - (a) to stop financing real estate or business activities that are located in areas where biodiversity may be negatively affected (e.g. using the protected area categories established by the International Union for Conservation of Nature⁶);
 - (b) to stop financing thermal coal activities, coal-fired power plants and production of shale gas.

⁶ See [here](#).

- Some institutions have included statements on engaging with all of their corporate clients to ensure that each client has a dedicated transition plan (with a formal diversification strategy) in place. For example:
 - (a) continuing to encourage corporate clients to improve their climate-related risk management;
 - (b) ensuring that counterparties measure and disclose climate-related impacts in line with the recommendations of the Task Force on Climate-related Financial Disclosures;
 - (c) calling for counterparties to comply with the Paris Agreement, for example by phasing out coal and unconventional fossil fuel production.

Quantitative indicators

Several institutions have developed quantitative indicators to identify and monitor C&E risks on the basis of available data. The methodology and data used to develop the indicators are transparently documented. The methodology is sound and clearly defines the indicators as well as the data used to develop them. For some indicators, the methodology provides for objective limits which are easy to measure, monitor and report.

Table A
Quantitative indicators

Indicator	Definition	Approach
Flood risk indicator at client level	Exposure to clients at risk of flooding	For its mortgage and agricultural portfolios, one institution identifies geographical location data on its clients' assets. It maps these data onto granular flood maps that allow it to use spatial statistics to identify assets subject to increased flood risk. This assessment is then aggregated to portfolio level to assess the total exposure at risk of flooding.
Physical risk indicator at sector level	Exposure with elevated physical risk at portfolio level	One institution developed a physical risk indicator to assess risk sensitivities at sector and geographical level. Sensitivity is measured by using proxies which allow the institution to assess the elevated physical risk at portfolio level. Examples of these proxies include: <ul style="list-style-type: none"> • ND-GAIN vulnerability index⁷ • macro(economic) indicators, e.g. the percentage contribution of agriculture to GDP and the percentage of the population living below an altitude of 5 metres above sea level • sector studies
Transition risk indicator at client level	Exposure to clients with elevated sensitivity to transition risk	For one institution each client is assessed in terms of their sensitivity to transition risk. This is determined based on a set of indicators (see the examples below) that depends on the sector in which the client is active. This assessment is translated into a client score ranging from medium to high to very high sensitivity to transition risk. The total exposure to clients with elevated sensitivity to transition risk is measured against the bank's capital base. Examples of these sector-based indicators include: <p>Energy clients:</p> <ul style="list-style-type: none"> • energy mix (renewable power generation revenues/total revenues) • geographical diversification (percentage of revenues generated across various geographic regions) • emission intensity (Scope 1+2 emissions under the Greenhouse Gas Protocol) <p>Transport clients:</p> <ul style="list-style-type: none"> • average age of shipping/aircraft fleet • low carbon capital expenditure allocation (percentage of capital expenditure allocated to emission reduction targets)
Transition risk indicator at sector level	Exposure to sectors identified as having elevated transition risk	Another institution has identified several sectors with elevated sensitivity to transition risk, on the basis of the recommendations of the Task Force on Climate-related Financial Disclosures (e.g. fossil fuel-based industries, CO ₂ -intensive manufacturing and transportation activities). ⁸ It then measures its exposure to clients from these sectors and seeks to mitigate the associated transition risk. To do so, it has set limits for those clients, e.g. to limit exposure to clients that generate more than a certain percentage of their revenue from coal.
Climate value at risk indicator (CVAR)	The portfolio's CVAR is a weighted aggregation of the CVAR of each asset in the portfolio	The CVAR represents the present value of the aggregated transition and physical risk costs as a percentage of the portfolio's market value. It is a scenario-based approach to assessing the asset-level impact given a set of transition risk (policy risk costs) and physical risk (extreme weather costs) scenarios. Depending on the severity of the impact under the various scenarios, each asset is classified as being at elevated risk or not.
Financed technology indicator	The share of coal in the institution's energy portfolio	One institution measures the share of coal in its primary energy mix portfolio (e.g. hydrocarbon producers) and its secondary energy mix portfolio (e.g. electricity generators).
Energy certificate indicator	The share of mortgages with collateral with an energy efficient energy label	For each mortgage client, the institution collects the government energy certificate of the underlying collateral. This energy certificate gives an indication of the energy efficiency of the building by measuring the dimensions of the building, the insulation of the roof and walls and existing installations such as boilers and solar panels. The bank tracks the share of homes with an energy-efficient certificate as part of total collateral of the portfolio.

⁷ See [here](#).

⁸ See [here](#), page 26.

Good practice 5

Integrating C&E risks into reporting practices, from gap analysis and data collection to reporting tools

Several institutions have developed an approach for establishing a reporting framework for C&E risks. These approaches consist of three components, namely a data gap analysis, a data collection strategy, and a data management and reporting framework.

i) Data gap analysis

Some institutions have assessed their C&E-related data needs based on their institution-specific risk profile and business model, as well as applicable or upcoming regulatory requirements. Subsequently, the institutions perform a data gap analysis by assessing their existing data availability and capabilities. Such an analysis identifies areas where data are not available or are not sufficient to meet the institutions' needs in order to manage C&E risks. These gaps can include for example:

- the lack of a specific or dedicated central IT architecture and the overall absence of a data strategy;
- the integration of C&E data collection and steering into business processes.

ii) Data collection

As a next step, some institutions have developed a data collection strategy to identify, collect and aggregate the data they need to measure relevant C&E risks. Some institutions have improved their reporting by collecting data from clients via specific questionnaires.

One institution has developed a dedicated C&E risk questionnaire, which is filled out at the time of credit origination and during annual reviews, to collect data from its clients. The C&E questionnaire must be completed for all counterparties at least once a year. The collected data may also be used for the calculation of Scope 3 emissions under the Greenhouse Gas Protocol.

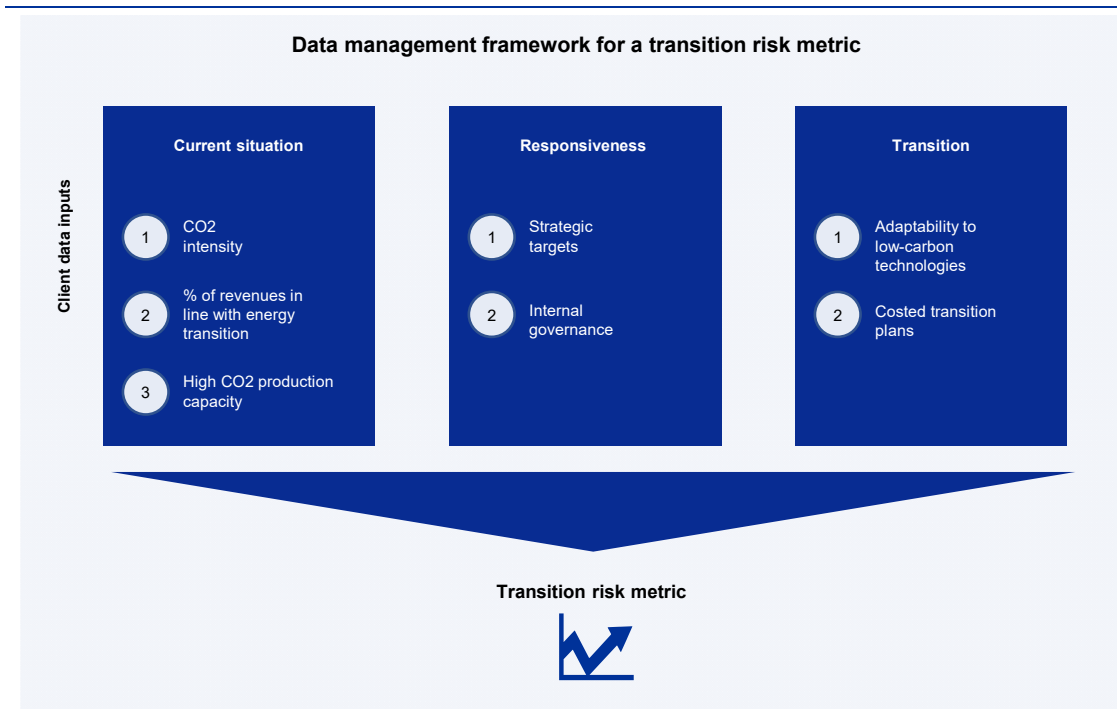
Another institution uses tools to collect C&E risk information, for example as part of the Two Degrees Investing Initiative (2DII data models) for the calculation of PACTA portfolio alignment, the Carbon Disclosure Project, or more specific tools and selected private data providers.

iii) Data management and reporting

For the purpose of data management, one institution has set up a dedicated platform for non-financial reporting. It includes an array of indicators deployed for all entities in the group, to steer the C&E risks that the institution is exposed to. Examples of these indicators include investments in energy sectors, the share of coal in the energy mix in the investment portfolio and the amount of financing directed to energy efficiency (i.e. loans for improving the energy efficiency of buildings). The platform functions as a group-wide steering tool that centralises internal and external data sources (e.g. rating agencies) and displays risk indicators for specific portfolios and entities, as well as for the institution as a whole. For example, one indicator uses a variety of data sources to create a rating for sensitivity to transition risk (Figure A).

Figure A

Schematised example of a data management approach for a risk indicator



5 Risk management

5.1 Observations from the assessment

5.1.1 Materiality assessment and risk management framework

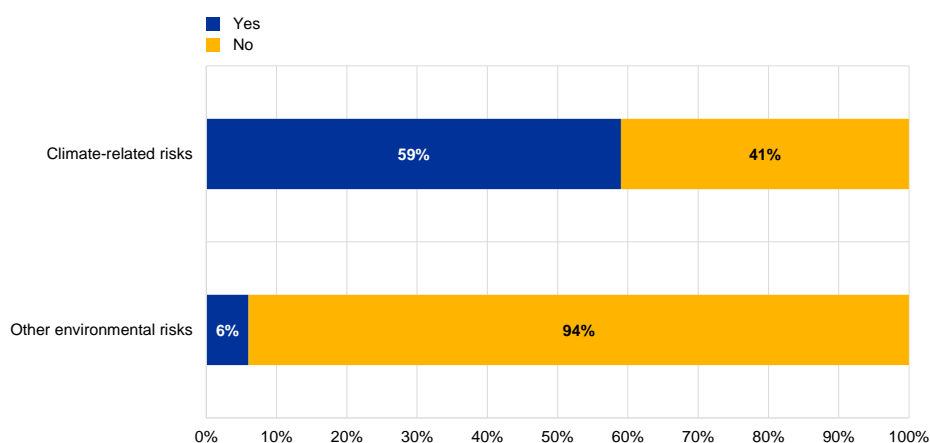
Institutions have started to assess their exposure to C&E risks, including as part of their materiality assessment processes. Such processes are, however, mostly qualitative. Few institutions make use of available proxies and estimation techniques and those that do have obtained significantly better insights into both the materiality of C&E risks and the impact of these risks on their business (see also Section 2.4). As a result, the latter institutions were able to implement a simple but comprehensive framework to set the level of appetite for these risks, monitor their evolution and steer the business.

Most institutions still have a blind spot for other environmental risk drivers, such as biodiversity loss and pollution. Institutions have generally started with collecting data and developing capabilities for climate-related risks. Only a handful of institutions have started taking into account other environmental risk drivers, such as biodiversity loss and pollution (Chart 11). For instance, one institution has started to develop a methodology to measure the biodiversity footprint of its investment and lending portfolios.

Chart 11

Percentage of institutions that have assessed whether climate-related and other environmental risks have a material impact on their risk profile

(percentages)



Source: ECB's supervisory assessment.

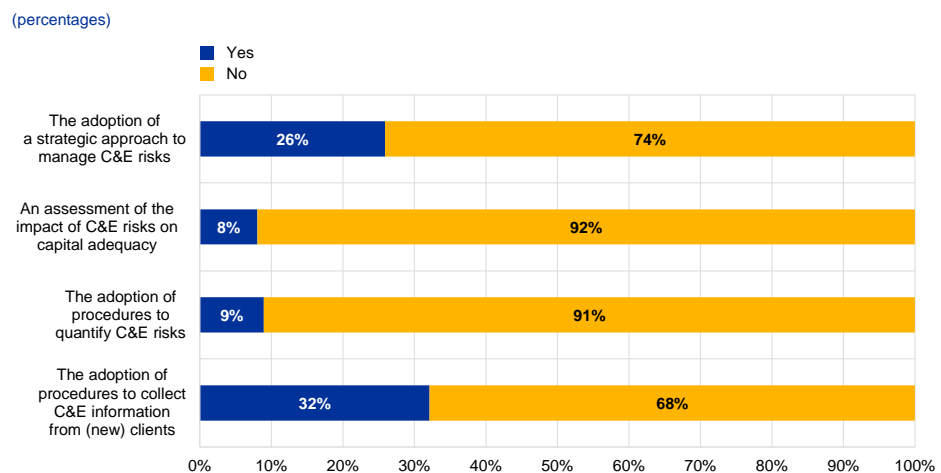
Institutions that have not assessed the materiality of C&E risks for their exposures lack the basic tools for adapting their risk management approach.

In the absence of such an assessment, the management body does not possess a

clear and comprehensive set of information for deciding on the integration of C&E risks into the risk management framework. These institutions are also at risk of taking unsubstantiated decisions on how C&E risks should be embedded in their risk management framework. Roughly one-third of institutions have procedures in place to collect relevant data from clients to assess C&E risks. Even fewer institutions have assessed whether C&E risks impact their capital adequacy or have developed policies and procedures to quantify C&E risks.

Chart 12

Percentage of institutions that have integrated C&E risks into selected processes for the risk management framework



Source: ECB's supervisory assessment.

5.1.2 Credit risk management

Institutions have made considerable progress towards integrating C&E risks into credit risk management. As seen in Section 2.4, institutions deem credit risk to be most exposed to C&E risk drivers. Consequently, roughly two-thirds of institutions have started adapting their practices related to credit risk management.

Most institutions have started with adapting policies and procedures. For example, roughly half of institutions have integrated C&E risks through enhanced due diligence procedures and dedicated questionnaires. In their lending policies, some institutions are integrating exclusion or phasing-out criteria to stop or limit financing of certain economic activities with elevated C&E risks, while others are pursuing financing of the transition of their counterparties.

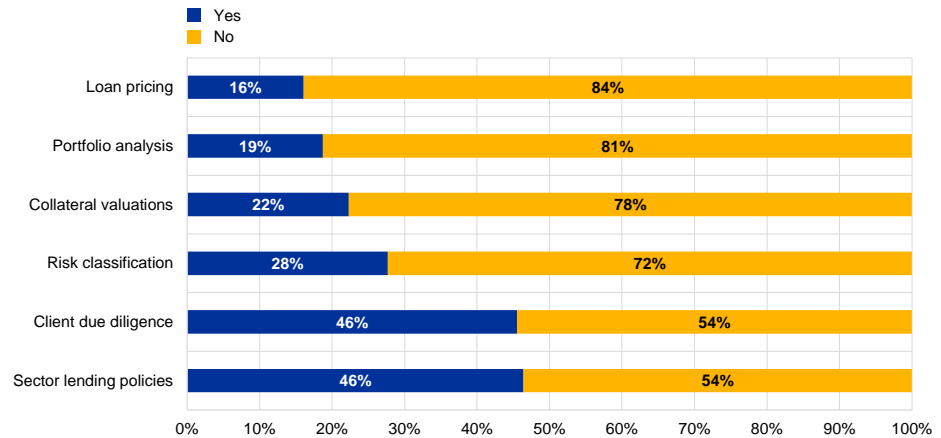
Institutions are also moving ahead with reviewing their real estate collateral valuations by assessing energy certifications of buildings. However, there is limited evidence that this information is integrated into their lending and monitoring practices, indicating that institutions may not yet be effectively managing the associated transition risk. Moreover, the ECB noted that only a few institutions are taking into account the geographical location of the real estate, which is a

precondition for identifying properties located in areas highly exposed to physical risk, such as floods.

Chart 13

Percentage of institutions that have integrated C&E risks into selected processes for credit risk management

(percentages)



Source: ECB's supervisory assessment.

Less than one-third of institutions have advanced their risk classification procedures. Most of the practices are of a largely qualitative nature.

Many institutions, for instance, classify their borrowers as low, medium or high risk based on C&E risk factors or heat maps for transition risk and physical risks. From a quantitative perspective, only a handful of institutions are making progress. For example, very few institutions integrate C&E risk factors into risk models or through the development of a “shadow” probability of default. One institution has integrated a special event risk factor into its probability of default model to account for possible C&E-driven reputation and legal risks of its clients that are not sufficiently captured by traditional credit risk analysis.

In terms of portfolio monitoring and management and loan pricing, institutions are still in the early stages of development.

Less than one-fifth of institutions are monitoring their credit portfolios and only in exceptional cases are they doing this comprehensively – for example by using heat maps and sectoral analyses to identify any concentration risks. Some institutions have started integrating C&E factors into their loan pricing. However, the ECB observed that the majority of institutions with differentiated loan pricing frameworks are providing discounts for the achievement of ESG goals (so-called ESG-linked loans), launching targeted products aimed at promoting the renovation of buildings and improvements in energy efficiency certificates (so-called green mortgages). However, it is not always clear how, beyond the aforementioned commercial considerations, risk management considerations are reflected in loan pricing.

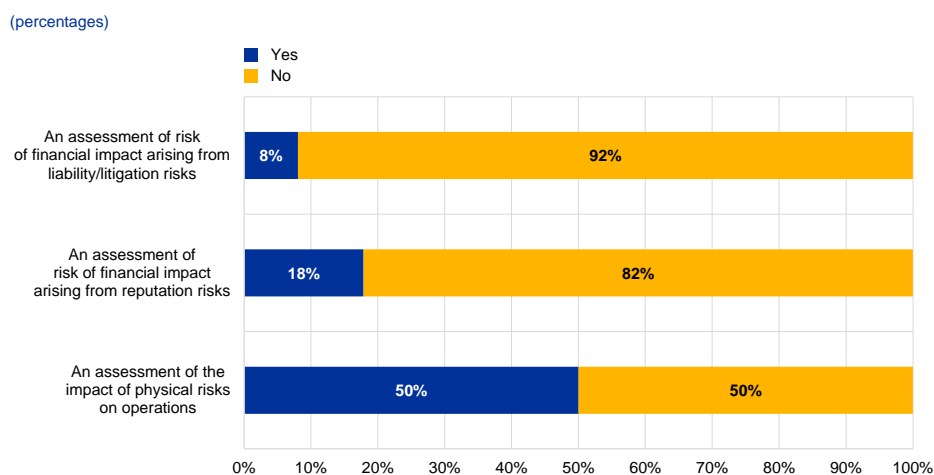
5.1.3 Operational risk management

While considerable steps have been taken, most institutions are still at an early stage of integrating C&E risks into their operational risk management.

Most of them have included the impact of physical risks in their business continuity policies, as they are deemed to be root causes of risks to critical processes, and mitigating measures have been identified and established for these risks. As regards reputational, liability and litigation risks, very few institutions have analysed in depth how C&E events could have negative impacts arising from future reputational damage, liability and/or litigation. Some institutions acknowledge that the growing stakeholder focus on emissions reduction targets and financing of polluting sectors is not only leading to increased reputational risk, but also has important second-round effects on business activity via reduced client loyalty, withdrawal of funds and investor divestments. Very few institutions have formalised the role of the compliance department in screening and assessing the impact of existing and upcoming regulations in the area of climate change and environmental degradation on institutions' products and processes.

Chart 14

Percentage of institutions that have integrated C&E risks into selected processes for operational risk management



Source: ECB's supervisory assessment.

5.1.4 Market risk management

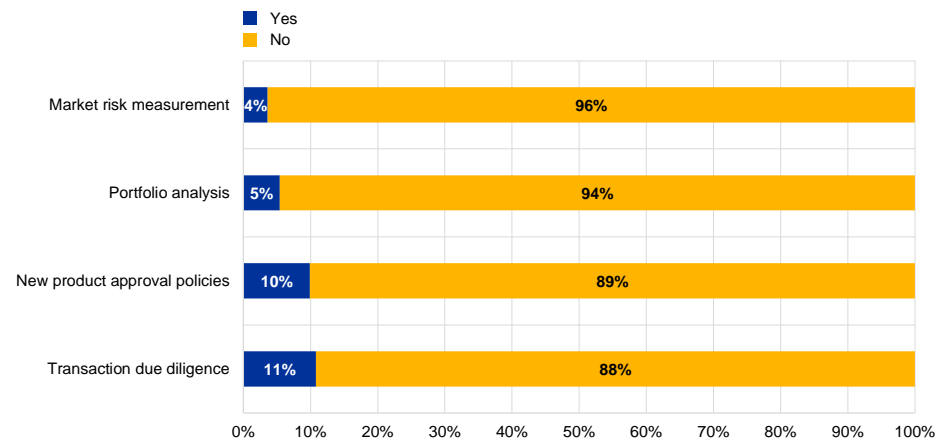
Most institutions have not started integrating C&E risks into their market risk management frameworks. Approximately 10% of institutions have started updating their market risk policies and processes and even fewer have included C&E risks in their market risk measurement metrics and their portfolio analysis and monitoring practices. Some institutions have integrated C&E risks into sector policies as part of their transaction due diligence. For example, some have done so with the intention of limiting their market risk exposures towards sectors internally classified as non-ESG-compliant. Sector policies are not only applied to new market risk exposures, but

also provide for phasing-out criteria applicable to the current market risk position of institutions.

Chart 15

Percentage of institutions that have integrated C&E risks into selected processes for market risk management

(percentages)



Source: ECB's supervisory assessment.

Only a handful of institutions have taken steps towards measuring the impact of C&E risks on market risk. Although institutions are relatively less advanced in terms of monitoring C&E risks in relation to market risk, some have included primarily stress testing methodologies where limits have been set as a function of losses arising from the application of different C&E-related scenarios. Institutions that are relatively more advanced in terms of monitoring and managing C&E risks in relation to market risk have not limited the implementation of new policies and processes to market risk arising exclusively from the trading book, but have also taken into account market risk within the banking book.

5.1.5 Scenario analysis and stress testing

The integration of C&E risks into institutions' scenario analyses and stress testing frameworks remains an important area for further development.

Roughly one-quarter of institutions have performed an ad hoc C&E-related stress test, scenario analysis or sensitivity analysis. However, only 13% of institutions have started integrating C&E risks into their regular stress testing frameworks.

The institutions that have performed such an analysis primarily focused on physical risks. Most of those institutions developed stress scenarios related to floods or droughts. Only a relatively small number of institutions included transition risk scenarios, for example, by formulating scenarios based on the expected impact on the global economy of alignment with the Paris Agreement. These scenarios are generally aimed at quantifying possible economy-wide impacts, without quantifying the impact on the institution's own portfolio.

5.1.6 Liquidity risk management

Most institutions have not started integrating C&E risks into their liquidity risk management frameworks. Only 11% of institutions have assessed potential vulnerabilities arising from extreme C&E events. For example, some institutions have integrated C&E events, such as natural catastrophes, into their liquidity contingency plans. In addition, some have also considered “greenwashing” as a potential threat to liquidity. By failing to reinvest the proceeds of so-called “green” issuances in accordance with their internal ESG framework, some institutions could face reduced access to market funding. Only a handful of institutions have made any progress on integrating C&E risks into their Internal Liquidity Adequacy Assessment Processes or into their regular liquidity stress testing frameworks.

5.2 Good practices

On the basis of the observations presented above regarding risk management frameworks, this section describes seven related good practices. The section first explores asset allocation and one institution’s growth strategy, including a stylised example of the mapping of sensitive sectors and materiality of the risk. The section then describes examples of physical risk estimation as applied to real estate; litigation risk management arising from C&E risks; sectoral investment and exclusion policies for market risk; and the definition of baseline and adverse stress testing scenarios for physical risks and transition risk is also presented. The last good practice addresses liquidity risk and shows an example of assessing liquidity vulnerabilities arising from C&E risk events.

Good practice 6

The integration of C&E risks into asset allocation

One institution has fully embedded transition risk and physical risks into its asset allocation process. The approach taken consists of the following steps:

- (a) The starting point was the establishment of a risk taxonomy to identify the most exposed business activities.
- (b) In a second step, the institution assessed the sensitivity of sectors to regulatory, technological and market risk drivers. This process allowed the institution to identify key metrics for assessing the impact of physical risks and transition risk on the business models of counterparties, in order to understand their adaptive capabilities and possible performance under different transition scenarios.
- (c) Within each sector, the institution broke down exposures into three categories: very high, high and medium sensitivity. It identified the total exposure at default (EAD) affected by transition risk and physical risks.

- (d) In the last step, the institution set up a key risk indicator to monitor and control exposure to sectors classified in the high and very high sensitivity categories. The monitoring and maintenance of the indicator was assigned to one specific business area. The indicator was then used to steer asset allocation and constrain the most exposed business activities: when exposures to these activities reaches the threshold, further risk-taking related to counterparties belonging to the same categories is not allowed.

Table A

Stylised example of the mapping of sensitive sectors and the materiality of the risk

Sector	Category	Transition Risk	Country 1				Country 2			
			EAD	% of total EAD	Rating	Average term	EAD	% of total EAD	Rating	Average term
Construction	Metals	High	28	0.72%	B+	2.4	1.181	1.75%	BB+	1.6
	Concrete	High	46	0.11%	BB+	2.1	287	0.80%	BB-	2.1
Automotive	Auto parts	High	542	0.88%	BB-	3.6	1.342	2.15%	BBB	2.2
	Car Dealers	Moderate	559	0.98%	B-	3.5	70	0.13%	BBB-	4.1
Transportation	Marine transp.	High	198	0.32%	BB	6.7	202	0.36%	BB+	4.8
	Air transp.	High	158	0.35%	BB	5.3	611	0.94%	B	2.8
Energy	Electric power production	Very high	273	0.45%	BB	8.2	967	1.56%	BB-	5.9
	Utilities	High	5	0.05%	BBB+	4.8	301	0.46%	BBB	3.4
	Gas supply	Moderate	12	0.00%	BB+	5.2	209	0.33%	BBB+	4.8
	Upstream	High	3	0.00%	BB	4.3	1.284	2.05%	BB-	4.7
	Downstream	High	347	0.65%	BB-	1.2	2.128	3.37%	BBB-	4.4
	Oil & Gas	High	9	0.00%	BBB-	4.7	1.517	2.48%	BBB	3.4
	Midstream	Moderate	102	0.15%	AA-	0.5	69	0.17%	BBB	5.2
Mining	Oil field service	Moderate	85	0.15%	BB+	1.4	628	1.04%	BBB+	4.1
	Coal	Very high	62	0.13%	BBB-	2.7	11	0.05%	BB-	1.3
Total Carbon Sensitivity			2429	4.94%			10807	17.64%		

This process has been incorporated into the group policies and scheduled to be performed every year. By concretely and comprehensively mapping the drivers of risk, the institution has also advanced its understanding of its data needs. Indeed, it rolled out specific templates to collect data from counterparties and facilitate the integration of these risks into its risk management framework.

Good practice 7

Credit risk: physical risk estimation as applied to real estate

Several institutions have developed practices to measure the impact of physical risks on real estate using proxies to overcome obstacles to data availability and to reflect the forward-looking nature of the C&E risks.

One institution made use of a tool to calculate the exposure and value of the portfolio vulnerable to the main extreme weather events (drought, heat stress, and ocean and river flooding). This tool segments these four extreme weather events into four risk profiles (A, B, C and D). The institution allocated responsibility for observing changes in the severity and frequency of each extreme event over the last decade to a steering committee. Based on this analysis, the institution decides what

kind of mitigating action may be taken to limit exposures and risk (e.g. no more financing in high-risk areas or insuring the property against this type of damage). Taking fluvial flood as an example, the percentage of the portfolio that would be affected by if the water level rises by more than 2.5 metres is less than 30%. As a follow-up action, the institution then checked building installations located on the first floor or higher to estimate the impact of the extreme weather event and consider whether mitigation measures are necessary.

Another institution assessed properties located at sea level, on the basis of one of the scenarios included in an exercise carried out by a geophysics institute on the rise in sea level over the next 30 years according to different rates of increase in temperatures. The institution estimated the value of the portfolio materially exposed to the risk of a rise in sea level and then calculated the estimated loss on its real estate portfolio, by multiplying the material exposure at risk (e.g. properties closer to the coast which could also be damaged by minor floods), the probability of damage to the building and the impact on the value of the building.

Good practice 8

Operational risk: litigation risk arising from C&E-related controversies

Several institutions have developed practices to account for C&E-related litigation and reputation risks:

- One institution assessed the litigation risk that might arise from controversies, in addition to the reputational impact, related to its involvement in the fossil fuel sector.
 - (a) The institution initially identified the types of fossil fuel financing that are the subject of campaigns by environmental activists (e.g. all extraction techniques, deep-sea drilling and shale gas extraction).
 - (b) As a second step, it initiated a comprehensive review of its processes to identify sources of legal risk, including: 1) the appropriate governance of transactions which present climate and environmental concerns, 2) communication policies related to fossil fuel financing, and 3) considerations with respect to such financing and the alignment of the business strategy with the Paris Agreement.
- Another institution put in place a process to ensure that when its exposure to environmental risks exceeds its appetite, this does not result in legal risks.
 - (a) Specifically, the institution mandated its legal department to review and advise on lending contracts established with counterparties which involve particularly high levels of environmental risk.
 - (b) In such cases, environmental safeguards (in the form of minimum environmental standards or objectives) are included in the contract with the counterparty to ensure that it takes action to improve its environmental profile. This helps to mitigate both C&E risks for the counterparty in general and litigation risk for the institution in particular.
 - (c) The institution's credit committee continually monitors developments in the environmental risk profile of counterparties and if such counterparties have not complied with the environmental actions established in the contract, it takes action.

- (d) To the extent that the institution can demonstrate a breach of contractual obligations, not only can the financing relationship be terminated, but the institution can also take legal action against the counterparty for any incurred damage driven by the environmental risk profile.

Good practice 9

Market risk: integration of C&E-related criteria in sector and investment policies

One institution has integrated C&E risks into its market risk management framework through the application of exclusion and phasing-out criteria to sector policies for exposures that are particularly prone to C&E risks. The sectoral investment and exclusion policy applies to market activities in general, irrespective of their accounting designation (i.e. irrespective of whether they are booked in the banking book or in the trading book), and delineates clear boundaries for investments in specific sectors and transactions with counterparties operating in such sectors. Investment boundaries can be summarised as follows. Investments or transactions with counterparties can:

- (a) be excluded from the market risk portfolio (specific phasing-out criteria);
- (b) not be considered for future inclusion in the market risk portfolio (counterparties and businesses operating in specific sectors are automatically excluded from the possible investment universe);
- (c) be added to the market risk portfolio, provided that they only conduct part of their business in sectors that are specifically permitted by the investment policy.

Examples of phasing-out criteria:

- Once a business activity is added to the exclusion list, all related net market risk positions shall converge to 0 in a maximum period of two months;
- Single positions shall converge to 0 in a maximum period of four months.

Examples of excluded business activities:

- Coal developers;
- Coal power producers.

Example of specific thresholds to delineate the boundaries of excluded sectors/companies:

- Investments in power-producing companies are only allowed if:
 - (a) installed coal-based production capacity is less than 3GW;
 - (b) the share of coal in the production mix is less than 10%.

Good practice 10

Stress testing: definition of baseline and adverse stress scenarios for physical risks and transition risk

One institution has developed detailed definitions of possible stress testing scenarios both for transition risk and for physical risks, together with the estimation of the potential impact of each scenario on the institution's credit portfolio.

As regards transition risk, the institution defined two possible scenarios: an orderly scenario (a smooth transition towards the Paris Agreement targets) and a disruptive scenario (a fast transition towards compliance with the Paris Agreement). Each scenario foresees specific targets at sector level – for the energy producing sector, the Emissions Trading System (ETS) sector and the non-ETS sector. Based on the defined scenarios as well as clients' financial performance, the institution estimated (via multiples of earnings before interest, taxes, depreciation, and amortisation) the potential investment required from its clients (without incurring any financial distress) to achieve a transition from the business as usual scenario to the Paris Agreement scenario.

Figure A

Schematic representation of the financial impact of transition risk scenarios

Macro sectors		Investment target (€ mln)		Investment potential (€ mln)	
		Orderly scenario	Disruptive scenario	Orderly scenario	Disruptive scenario
Energy	Electricity production	40	450	16	15
	Oil and gas	10	200	5	5
ETS industry	Chemicals	205	280	51	90
	Glass production				
	Others				
Others	Agriculture	-	-	-	-
	Waste management	35	30	15	15
Total		290	960	87	125

As regards physical risks, the institution conducted a detailed and granular mapping of the potential physical risks that could affect its client portfolio, assigned a physical risk score at client level and at collateral level for immovable property (using geospatial location data), and constructed a synthetic client scoring based on the estimated impact of the different physical risk scenarios.

Figure B

Geographical comparison of areas with low and high risk of flooding



Good practice 11

Liquidity risk: assessment of liquidity vulnerabilities arising from C&E risk events

One institution has integrated a first qualitative assessment of potential liquidity vulnerabilities arising from C&E risk events into its risk inventory.

In identifying such vulnerabilities, the institution considers such risks from both an economic and a normative perspective. Under this approach, the portfolio is segmented into physical risks and transition risks. Physical and transition risk categories are then further broken down into more specific sub-categories to identify areas where potential liquidity vulnerabilities may arise (Figure A).

Figure A

Example of an environmental risk breakdown and impact assessment

	Physical risks		Transition risks					
Time frame	0-36 months	> 36 months	12-16 months	24-60 months	0-60 months	12-60 months	0-36 months	0-60 months
Liquidity risk	Acute physical risks	Chronic physical risks – climate change	Political & legal pressure on banks	Green regulation	Green technology	Market sentiment	ESG reputation	Ecological protectionism
	High relevance	Low relevance	High relevance	Low relevance	Low relevance	Low relevance	High relevance	Medium relevance

The approach taken consists of the following steps:

- (a) A scoring system based on the potential impact of C&E risks on relevant liquidity metrics (e.g. the liquidity coverage ratio – LCR), together with the definition of relevant thresholds for the institution, is used to evaluate the relevance of each C&E risk area.
- (b) To assess the relevance of each C&E risk area, the institution defines a base LCR threshold by looking at normal market conditions and investigates deviations from this base threshold.
- (c) A C&E risk is assigned high relevance when it could potentially lead to a drop of about 5% in the institution’s LCR from the base threshold. Medium relevance is assigned to C&E risks that could lead to LCR drops of between 2% and 5% from the base threshold, while low relevance is assigned to drops smaller than 2%.
- (d) These limits are defined by the institution by looking at historical monthly changes in LCR levels over a period of three years. This analysis is considered by the institution as the starting point for the definition of more detailed and forward-looking stress test scenarios.

Stress test scenario input

To give an example, the institution designed a stress test scenario comprising the materialisation of the risk of greenwashing of green bonds issued, in combination with other idiosyncratic situations, and analysed the impact of such events on its LCR buffer. In particular, the institution assumed that some of the proceeds of the green bonds issued were not invested according to the eligibility criteria as set forth in its previously disclosed guidelines. Such an event causes several wholesale counterparties to withdraw their funding, followed by corporate and government counterparties as well as retail investors.

To increase the effectiveness of the exercise, the institution considered different scenarios in terms of severity and analysed the effects of such a shock on its LCR buffer over a time horizon of two years. In the most severe scenario, the institution also considered the effect of such reputational damage on future green bond issues.

6 Disclosures

This chapter covers solely the assessment of the internal policies adopted by institutions with respect to C&E risk disclosures. Later this year the ECB will perform a dedicated supervisory assessment on institutions' public disclosures. This comprehensive assessment will focus on the content and substance of the disclosures. The results will be published separately in a dedicated report on disclosures.

6.1 Observations from the assessment

Institutions have been taking steps to expand and improve their disclosures on C&E risks in their annual report or other dedicated reports. These actions are being carried out in the context of increasingly stringent regulatory requirements for C&E disclosures. The European Banking Authority is working towards the publication of implementing technical standards (ITS) on Pillar 3 disclosures on ESG risks. The European Commission has adopted a proposal for a Corporate Sustainability Reporting Directive (CSRD). This Directive envisages the adoption of EU sustainability reporting standards. These are being developed by the European Financial Reporting Advisory Group (EFRAG).

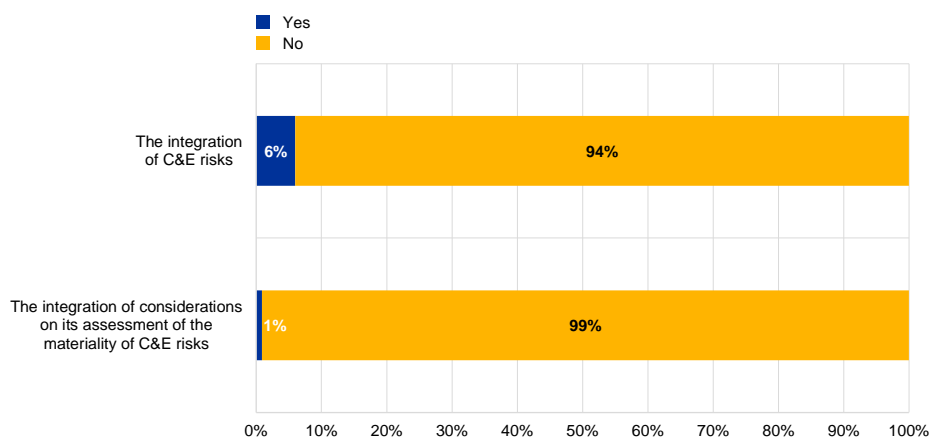
However, only a small subset of institutions has integrated C&E risks explicitly into their disclosure policies. The fact that more institutions have started disclosing C&E risk information publicly might warrant a review of institutions' policies for assessing the appropriateness of their disclosures. For institutions that commit publicly to environmental objectives, it is important to be transparent about the definitions and methodologies they use, among other things, in order to comprehensively convey their risk profile to market participants.

The vast majority of institutions have not integrated into their disclosure policies the considerations that inform their assessment of the materiality of C&E risk information for financial decision-making. While over 20% of institutions disclose the outcome of their assessment regarding the materiality of information in their public disclosure report, only one institution has included the underlying considerations in their internal disclosure policy. It is important for disclosure policies to specify how the materiality of information regarding C&E risks is assessed, as this assessment drives the decision on whether to disclose certain information. As there is no common threshold for materiality, it is important that institutions conduct an assessment tailored to their business models and risk profiles over short and longer time horizons. Any conclusions on the materiality of information should be measured against concrete quantitative and qualitative thresholds and the disclosure policy should stipulate that such conclusions should be accompanied by the transparent rationale.

Chart 16

Percentage of institutions that have integrated C&E risk information into their disclosure policies

(percentages)



Source: ECB's supervisory assessment.

6.2 Good practices

Based on the observations from the assessment, this section presents an example of an institution that established a dedicated policy framework for C&E risk disclosures.

Good practice 12

A dedicated policy framework for C&E risk disclosures

The institution's disclosure policy describes how its C&E risk disclosures are drawn up. This includes, among others things, the definitions underpinning the disclosure policy, including the definition of materiality, a reference to the methodological standard used by the institution and a description of the relevant steps for the preparation of C&E risk disclosures. For each step, the policy allocates the corresponding roles, responsibilities and tasks to the organisational units involved.

The disclosure policy provides a list of aspects to be taken into account for the purpose of assessing the materiality of information. This list encompasses both quantitative and qualitative indicators (e.g. based on metrics and data recommended by the Task Force on Climate-related Financial Disclosures, SASB⁹ and PACTA¹⁰). The policy also lays down the process for performing the materiality assessment and the frequency with which this is done, as well as a clause specifying situations in which the materiality assessment would be reviewed prior to the next scheduled regular reappraisal. The justification for the decision made as regards the frequency is documented. In addition, the policy specifically highlights the fact that the materiality assessment is verified and

⁹ Sustainability Accounting Standards Board

¹⁰ Paris Agreement Capital Transition Assessment

approved by the management body in its executive function and that the risk committee is regularly informed of developments concerning the materiality assessment.

In order to extend the scope of the information provided in the C&E risk disclosures, the institution conducted a gap analysis with respect to the European Commission's Guidelines on Non-Financial Reporting and the related supplement on reporting climate-related information.

- (a) As a first step, the institution identified the key performance and reporting indicators, as well as other reporting information contained in the aforementioned Guidelines and Supplement.
 - (b) It then compared these indicators and reporting information against the content of its previous C&E risk disclosure to identify existing gaps.
 - (c) As a third step, the institution identified indicators and information that it can already provide in the next C&E risk disclosure, as well as indicators and information that will require follow-up actions before they can be disclosed.
-

7 Conclusions

All in all, institutions have started paving the way, but the pace of progress remains slow in most cases. The expected completion timelines submitted to the ECB show that many institutions will not have practices in place that are aligned with the ECB's supervisory expectations in the near future. More than half of the institutions will not have completed their plans by the end of 2022. These institutions may not be able to soundly, effectively and comprehensively manage C&E risks that they are exposed to.

The ECB recognises that the challenges linked to the integration of C&E risks into strategies, governance and risk management arrangements are constantly evolving. Therefore, the ECB is committed to continuing its dialogue with the institutions so that they keep on strengthening their management of C&E risks. This report is a key supervisory effort to share observations and good practices that illustrate avenues for aligning institutions' practices with the supervisory expectations.

The ECB expects all institutions to take decisive action to address the shortcomings set out in a dedicated supervisory feedback letter. A supervisory dialogue with each institution was conducted by Joint Supervisory Teams between August and September 2021. Accordingly, all institutions received a feedback letter outlining the main shortcomings as well as an overview of peer benchmarking. For some institutions, a qualitative requirement may be communicated as part of the 2021 SREP. Owing to the evolving nature of C&E risk management, the ECB is aware that data and methodological gaps may make it difficult to fully implement the supervisory expectations in some cases. The ECB expects institutions to adopt a strategic approach and to take intermediate steps as appropriate.

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