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Position Paper Nature

DZ BANK AG

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Foreword

Sustainability has for many years been an integral part of the strategic direction of DZ BANK AG. Our profile has been continually refined and further developed: From creating transparency regarding the impact of our business activities in relation to the Sustainable Development Goals all the way to sector-specific decarbonisation targets and advances in our own operations' environmental footprint. DZ BANK AG supports companies on their journey towards a position that is entrepreneurial, social and forward-looking in terms of environment.

Alongside climate change, another closely related issue is increasingly coming to the fore: The state of nature. Healthy ecosystems are essential for economic value creation, as they ensure, amongst other things, the availability of water, raw materials and fertile soil, thereby guaranteeing stable production and supply chains. The loss of biodiversity and the degradation of ecosystems are therefore not merely ecological challenges; they are already affecting the foundations of economic stability.

Against this backdrop, DZ BANK AG is taking a close look at the topic of the natural world. The focus is on the interactions between economic activities and natural systems: How

business affect nature, their degree of dependency on intact ecosystem services, and the nature-related risks arising from them. At the same time, the growing importance of nature-related topics is also opening up new opportunities for the financial sector, particularly in relation to investments in the protection, restoration or sustainable use of natural capital.

Within this broad field, DZ BANK AG places particular emphasis on freshwater. Water is a key foundation for economic activity across numerous sectors, yet at the same time it is becoming increasingly scarce. Pressures on freshwater ecosystems, increasing pressure from human

use, and structural and climate-related changes in the water cycle are increasing the risks for businesses and entire economies, for example through rising costs, production losses or supply chain disruptions. At the same time, there is a growing need for investment in the freshwater sector, along with corresponding financing opportunities.

This position paper sets out DZ BANK AG's approach to environmental issues, especially in relation to the natural world. The aim is to embed nature-related issues in the business model in a scientifically sound manner and to develop it further as an integral part of the sustainability strategy.

Chapter 1

Background and Relevance of Nature



Nature forms the basis of our economic and social prosperity: Ecosystem services such as clean water, fertile soil, pollination, coastal and flood protection or climate-regulating functions are fundamental prerequisites for stable economies and a functioning value chains. However, scientific analyses show that worldwide these services are deteriorating at an alarming pace, with palpable consequences for both individual companies and for entire sectors, as well as for the potential impact on economic stability and financial systems.¹

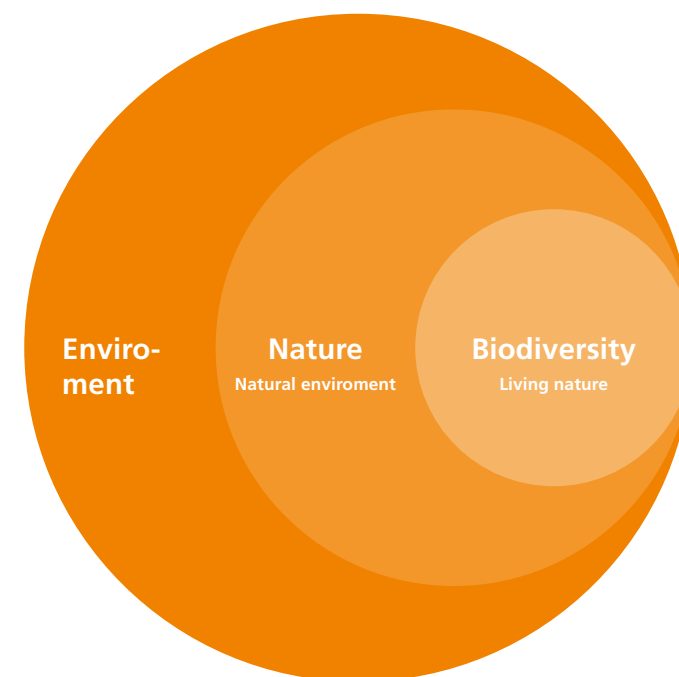


Figure: Explanation of key terms: The “environment”, as an overarching framework, encompasses both natural and human-shaped systems; “nature” refers to the natural environment, whilst “biodiversity”, as part of this, describes the diversity of life

At DZ BANK AG, we deliberately use the terms “nature” or “natural world”. These terms serve as a conceptual framework that brings together nature-related topics within the context of economic activities and financial management. We understand nature as a holistic system that encompasses the totality of biotic and abiotic components – that is, the diversity of species and ecosystems, as well as water, minerals and metals, and the diverse interactions between these elements. Within this integrated understanding, biodiversity describes a key characteristic of the natural state: The level

of biodiversity can serve as a key indicator of the functionality, resilience and integrity of natural systems. Natural capital is defined as those natural resources and ecosystem services that generate economic value and whose productivity declines as a result of over-use or degradation. Such an integrated understanding of nature is also reflected in industry standards such as the recommendations as set out by the Task Force on nature-related Financial Disclosures (TNFD), which deliberately broadens the outlook: Moving away from individual elements towards a holistic understanding of

nature as an integrated system, with all its dependencies, risks and opportunities. The term “environment” is used in a broader sense here and encompasses not only natural systems but also those shaped by human activity, whilst “nature” refers specifically to the natural foundations of economic and social development.²

Scientific assessments by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) show that: The state of global ecosystems has deteriorated significantly in recent decades, and one million species are threatened with extinction. Particularly serious are the declines in the quality and functionality of habitats, the global decline in pollinator species, and the growing risks to food security and economic stability. These developments make it clear that the loss of nature is not merely an environmental problem but is already having economic repercussions today and will become an even greater risk factor in the future.¹

The most recent IPBES report, published in 2026, underpins these findings with further global data and vividly illustrates the economic implications of biodiversity loss: Whilst global economic growth has increased massively since 1820, there has recently been a contrasting trend in natural capital: Since 1992, global stocks have fallen by around 40 per cent. Over the same period, human-generated capital – for example, in the form of infrastructure, buildings and production facilities – has roughly doubled. Furthermore, around US\$ 7.3 trillion are spent each year on activities that have a direct negative impact on nature, whilst only around US\$ 220 billion are invested in the protection and restoration of biodiversity. At the same time, IPBES shows that at least eight countries worldwide, as well as the European Union, have already carried out independent analyses of their financial systems' dependence on biodiversity – a clear sign that the loss of nature is increasingly being recognised as a systemic risk.^{3, 4}

Water as a critical component of natural capital

Water is one of the key components of natural capital and plays a vital role in social stability and economic performance. Key water-related ecosystem services – from the provision of freshwater to the regulation of hydrological processes and the safeguarding of water quality – are under considerable pressure worldwide. Freshwater ecosystems are the natural environments that have been most severely affected. Disruptions to the water cycle have a substantial impact on nutrition, health and economic development. Water, as a geopolitical lever, could further exacerbate these developments.¹

Parallel to these global findings, quantitative risk data also reveal a marked deterioration in the water situation. Analyses by the World Resources Institute (WRI) show that around a quarter of the world's population lives in regions experiencing "extremely high" water stress – that is, regions that regularly use more than 80 per cent of their available renewable water resources. This water stress is particularly acute in the Middle East, North Africa and South Asia. Furthermore, around half of the world's population is affected by severe water shortages for at least one month of the year. Key drivers include population growth and water-intensive economic activities such as irrigated agriculture, livestock farming, energy generation and industrial production. In addition, structural factors reduce the available water supply – including management frameworks that permit withdrawals in excess of natural replenishment, as well as increasing climate-related variability, with more frequent and longer periods of drought and more intense rainfall events.⁵

In Europe too there are increasing signs of pressure on water-related natural capital functions. The European Environment Agency (EEA) reports that in several regions chronic or seasonal water stress is already occurring, putting pressure on the availability of freshwater resources; in addition, alongside industry and

energy generation, the high level of pressure from agricultural use in particular increases the input of nutrients and other pollutants, which further undermines the stability of European freshwater ecosystems.⁶ This development has tangible consequences for both economy and society. The increasing pressure on water-related natural capital services heightens vulnerability to production disruptions, price fluctuations or supply chain disruptions, and highlights just how closely the resilience of economic systems is linked to the stability of water resources.



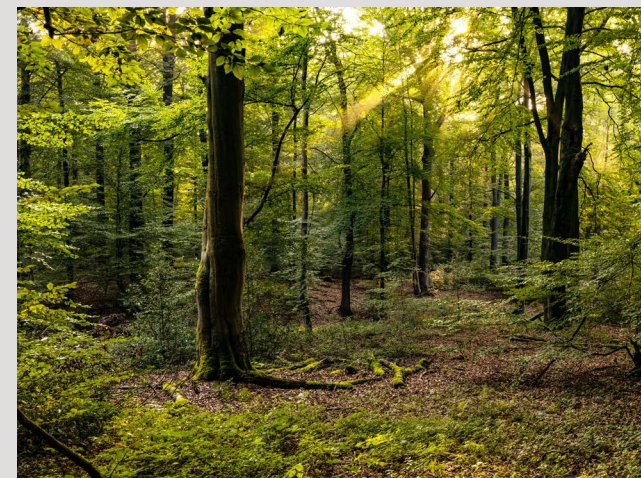
Kunming Montreal Global Biodiversity Framework

A key turning point in global nature conservation was the adoption of the Kunming-Montreal Global Biodiversity Framework (GBF) at the UN Biodiversity Conference, COP15, held in Canada in 2022.⁷ The framework sets out 23 global targets for 2030, including the key '30 x 30' target, which aims to effectively protect at least 30 per cent of the world's land and marine areas and to restore a further 30 per cent of already degraded ecosystems by 2030. A total of 196 countries adopted the framework at COP15, including Germany, which has enshrined the targets in its National Biodiversity Strategy 2030.⁸ Given current trends, it is questionable whether the global 2030 targets can realistically be achieved. The objectives have been deliberately formulated in ambitious terms, as they serve as a necessary framework for transformation. However, without the systematic channelling of financial flows, these goals would not be achievable – and this is precisely where the financial sector, and therefore DZ BANK AG, has a key role to play. DZ BANK AG regards it as part of its responsibility within the Cooperative Financial Network (CFN) to contribute to these objectives, i.e. to support customers with financing solutions that help them achieve their environmental and climate goals.

At European Union level, too, this global urgency has been translated into specific regulatory requirements. With the Corporate Sustainability Reporting Directive (CSRD) – an EU directive adopted in 2023 on corporate sustainability reporting – and the associated ESRS standards, nature-related issues are being integrated into corporate reporting in a binding and comprehensive manner. Of particular relevance to financial institutions is the fact that the environment is addressed in several key chapters of the ESRS – including pollution (E2), water and marine resources (E3), biodiversity and ecosystems (E4), and resource use and the circular economy (E5). This provides a clearer picture both of how

companies impact the natural world and of the extent to which their own business models depend on intact ecosystems.^{9,10}

The banking supervisory authority builds on these disclosure and governance requirements and sets them out in concrete terms for use by financial institutions. The requirements set out by the European Banking Authority (EBA) show that nature-related risks are now given a similar level of priority to climate risks.¹¹ Institutions are required to systematically take nature-related risks into account in their lending and credit monitoring processes – across various risk channels: economic activities, supply chains, locations, collateral and reputational risks. In practical terms, this means that nature-related risks are becoming increasingly important for banks in lending processes, data management, risk analysis and pricing. Furthermore, with its guidelines on environmental scenario analysis published in 2025, the EBA is expanding the regulatory framework to include clear expectations regarding forward-looking analyses. The guidelines require institutions to use short-, medium- and long-term scenarios to systematically assess their financial and business model resilience to environmental risk drivers.¹²



Alongside political and regulatory developments, we are also observing changing market expectations: Investors, credit rating agencies, customers and civil society organisations are increasingly calling for transparent information on dependencies on nature and the impact of economic activities on ecosystems. This marks a shift in how the market is understood: nature is increasingly recognised as a key financial factor that can influence business models, company valuations and credit risks.

For DZ BANK AG, as the central institution of the CFN and a major player in the German financial market, the findings, frameworks and expectations outlined above entail a twofold responsibility: Firstly, to systematically integrate nature-related risks and dependencies into the organisation's own risk management, strategic planning and reporting. Secondly, to gradually prevent and reduce negative impacts on the natural environment, to strengthen positive contributions, and to identify and capitalise on emerging opportunities at an early stage – in collaboration with customers and cooperative banks.

Chapter 2

Impacts, Dependencies, Risks, Challenges and Opportunities in the Context of Nature

2.1 Impacts, Dependencies and Risks

Impacts: How economic activities are changing the natural world

Economic activities affect natural capital throughout the entire value chain: Even the extraction of raw materials can take up land, encroach on habitats or place a strain on water resources. At the site itself, land use and land-sealing, water abstraction, emissions and wastewater have a direct impact on local ecosystems; further downstream, pollution of water bodies, soil and the atmosphere, as well as the management of waste materials, have further consequences.⁸

The extent of an impact depends largely on the spatial and temporal context and on the initial ecological conditions: The same activity can have significantly more serious consequences in a catchment area already at risk of water stress, near ecologically sensitive habitats, or during critical seasons than in other locations.³

For financial institutions and their customers, this means there is a need to identify potential negative impacts on the natural environment at an early stage and, where possible, to avoid or limit them. To this end, DZ BANK AG draws, amongst other things, on its sector principles, which address potential negative impacts in selected sectors and define minimum requirements for environmentally and socially responsible business practices. In addition, established audit and monitoring tools based on international standards such as the Equator Principles are used in the context of project finance and specialist corporate finance, to systematically assess and manage potentially significant adverse impacts on nature and the environment.⁹

As well as having adverse effects, economic activities can also have positive impacts, i.e. contribute to the improvement of natural capital, for example through restoration projects, habitat enhancement or nature-based solutions that specifically strengthen or restore certain ecological functions. However, demonstrating the effectiveness of such measures is context-dependent and methodologically challenging: Not every measure restores lost functions, and for a robust assessment, criteria such as additionality, permanence and potential displacement effects must be carefully examined.⁸ For example, the deforestation of a species-rich area of rainforest cannot simply be offset by planting new trees in another region. Even if the trees planted sequester CO₂ in the long term, they do not replace either the lost biodiversity or the complex ecological functions of the original ecosystem. Against this background, positive impacts should be understood as potential, but not automatically effective, contributions to the stabilisation of ecological functions.³

The systematic reduction of negative impacts is crucial for financial institutions – both to protect ecological functions and to mitigate risks. For the greater the pressure on ecological functions, the more likely it is that political or market-driven responses will emerge, manifesting as transition risks.

Dependencies: How economic activities depend on nature

Conversely, economic activities depend in many ways on natural capital and functioning ecosystem services, for example on provisioning services such as water availability, fertile soils or raw materials, as well as on regulating services that fulfil quality-maintaining or purifying functions, such as water quality, pollination, CO₂ storage and protection against flooding and erosion. There are also dependencies throughout the entire value chain: Whilst the extraction of raw materials is directly dependent on natural resources, production, processing and transport also require stable environmental conditions. The extent of these dependencies varies, particularly by sector.^{3, 8}

From both impacts and dependencies, various risks arise for financial institutions and their customers.

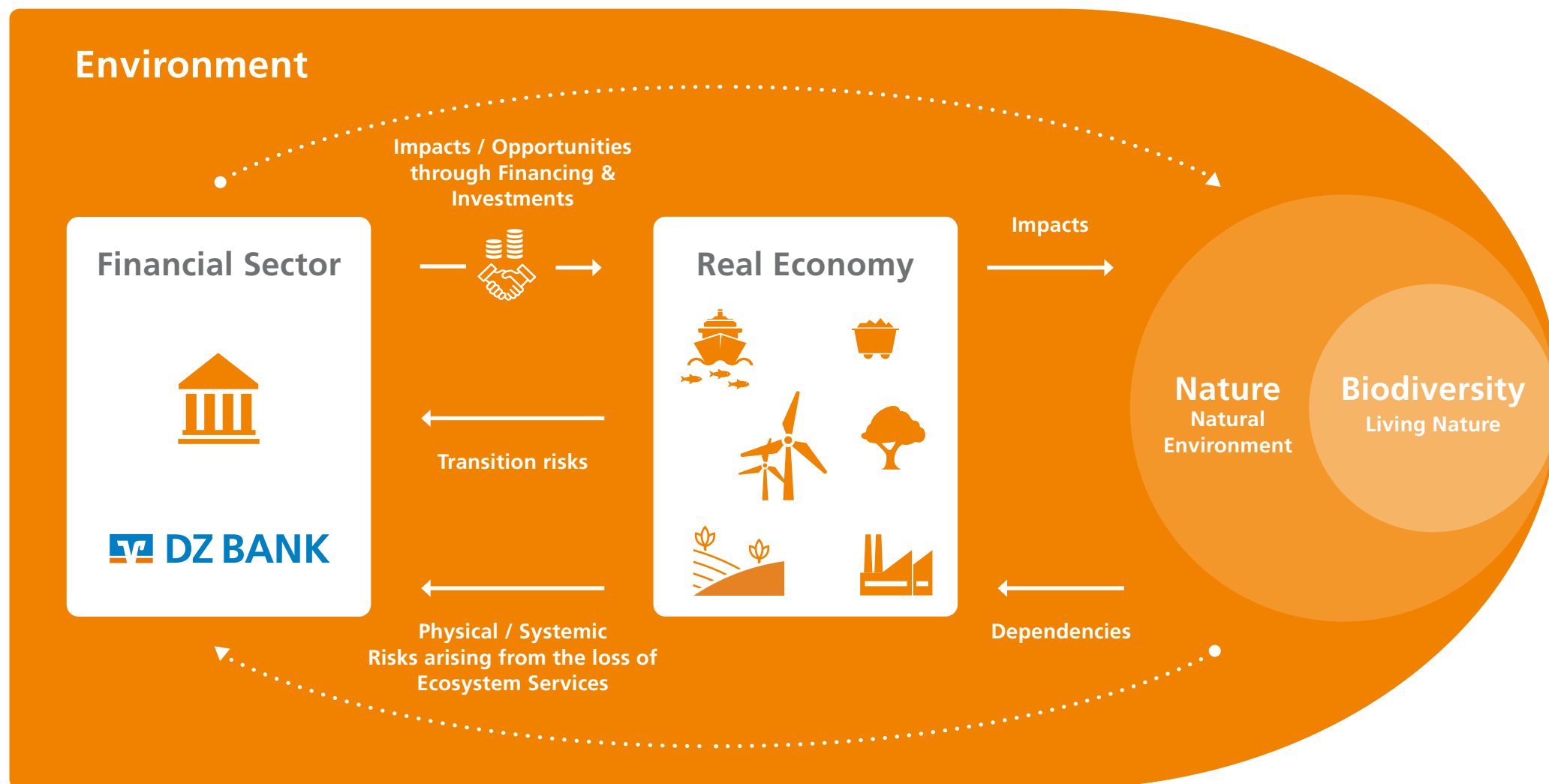


Figure: The interplay between the financial sector, the real economy and nature: Economic activities affect natural systems (impacts), whilst businesses are, at the same time, dependent on intact ecosystems services (dependencies). This may give rise to risks for the financial sector.

Transition risks: Changes in politics, technology and demand

Transitional risks arise from key drivers such as new political frameworks, technological standards or market requirements. Measures in these areas are increasingly aimed at protecting and restoring nature and/or reducing negative impacts on nature. Such regulatory, technological or market-related changes can trigger pressure to adapt and influence the economic performance of companies through various channels – both directly and indirectly along the entire value chain.⁸ As the ways in which these changes take effect are diverse and context-dependent, the corresponding risk impact channels cannot be categorised exhaustively. For instance, various types can be described, e.g. those which apply at the particular location, those that impact on the supply chain or arise through sector exposure.¹⁰ A number of typical channels of risk can be sketched along three central drivers of transition risks:

- (1) Politics: Stricter extraction or quality limits may necessitate investment at the production site, restrict usage options or increase operating costs. For example, the designation of new nature conservation areas, the restoration of degraded land, or more stringent measures to protect ecologically sensitive regions – including Key Biodiversity Areas (areas of particular importance for biodiversity) – may reduce the land available for economic activities and lead to land-use restrictions or the relocation of production.
- (2) Technology: New technical standards, more efficient processes or alternative materials may make production methods more expensive, make additional investment necessary or put established practices under competitive pressure.
- (3) Market & Demand: Higher expectations regarding water efficiency, nature-positive production methods or supply

chain transparency can alter sales opportunities, influence supply chains or exacerbate reputational risks.

Along these value chains, temporary changes translate into higher costs, lower cash flows or losses in value for companies, and thus indirectly into various financial risks for financial institutions.¹⁰ Companies with negative environmental impacts are more likely to be affected by this, as they are confronted more frequently and to a greater extent with cost increases or the need to adapt.² However, companies should not act solely in response to external requirements, but should also develop their own interest in reducing their negative impacts, as changes to the natural environment may not only act as transition risks through altered framework conditions, but may also have a direct impact as physical risks on locations, sectors and the availability of resources.

Physical risks: Impacts of dependence on ecosystem services

Physical risks arise wherever companies are dependent on stable ecosystem services, and these services could be lost, impaired or decline in quality.⁸ Negative changes to ecosystem services can spread rapidly along global value chains, thereby significantly disrupting key production sites and economic activities. Sectors that make heavy use of water and other resources, such as agriculture, forestry, fisheries, conventional electricity generation and food production, are particularly affected. For financial institutions physical risks arise primarily indirectly – via the risk profiles of the companies in the loan portfolio, that is, via their sectoral and geographical exposure. Particularly in regions where nature-dependent sectors are heavily concentrated, environmental disruptions can lead to potentially significant portfolio effects.

As many ecosystem services are of macroeconomic significance, physical risks in particular can have macroeconomic

effects beyond their direct impact on businesses; for example, through crop failures, widespread resource shortages, supply chain disruptions, and health risks arising from declining water quality or the emergence of zoonotic diseases. If such natural disturbances increase in frequency and intensity, this may, in the long term, undermine economic stability, for example through a decline in production and value added, as well as through price rises and increased price volatility. At the same time, large-scale, cross-sectoral shocks increase the likelihood that financial institutions will be affected across a broad range of their portfolios, particularly when many borrowers and economic sectors come under pressure simultaneously.²

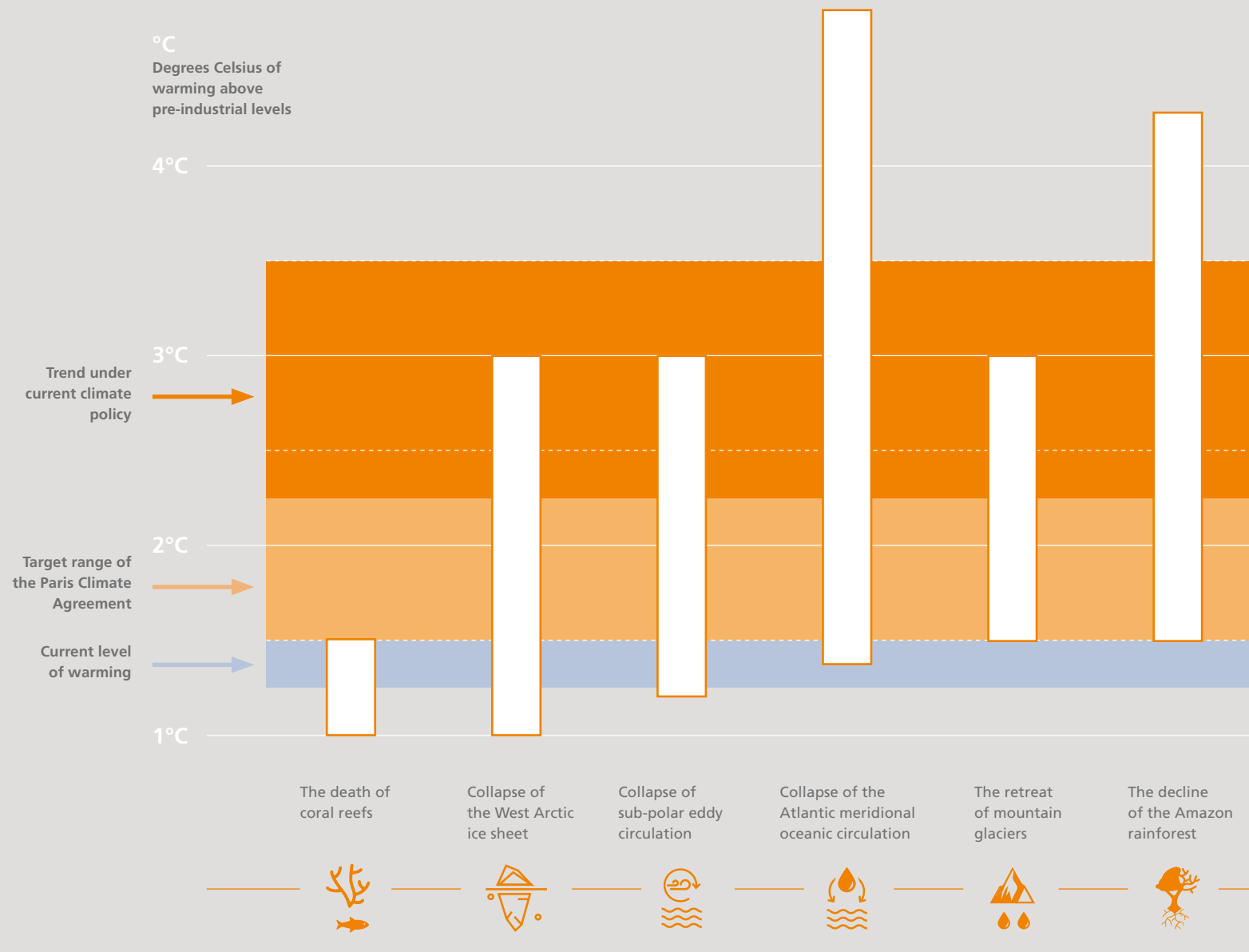
Systemic risks: Cascade effects and loss of systemic stability

Systemic nature-related risks arise when disruptions to natural systems do not act in isolation, but instead intensify through feedback loops, chain reactions and the combined effect of multiple stresses, leading to large-scale system failures. They are characterised by the fact that several changes, each of which is limited in its own right, interact and reach critical tipping points, as a result of which natural systems are no longer able to perform their functions as they did before. In this context, physical and transition risks can reinforce one another and, in extreme cases, lead to the destabilisation of economic and financial systems.⁸

The link between changes in nature and climate

As global warming intensifies, the risk of exceeding ecological tipping points is increasing significantly. This makes it clear that:

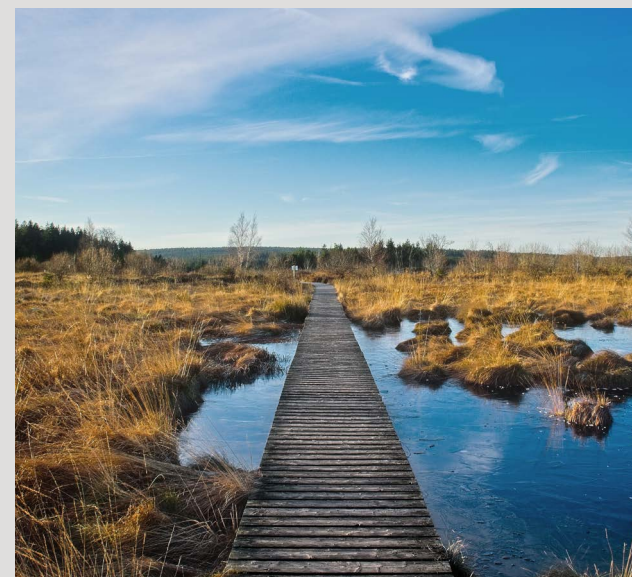
Changes in nature and climate often reinforce one another. Even with global warming of just 1.5 to 2 degrees Celsius compared with pre-industrial levels, natural systems lose their stability and, with it, their regulatory functions, such as sequestering CO₂ or regulating water. This, in turn, increases the likelihood of climate-related risks such as droughts, extreme weather events or floods.⁷



Moors

Moors (peatlands) are ecosystems with permanently water-saturated soils, in which organic matter is only partially decomposed due to a lack of oxygen, leading to the formation of peat over a long period of time. These specific site conditions make moors ecologically sensitive habitats that are of great importance for the water and nutrient cycles, as well as for specialised animal and plant species. Functioning, near-natural peatlands provide a wide range of ecosystem services: They promote seasonal water retention in the landscape, regulate nutrient levels, help stabilise the regional climate and act as carbon sinks and reservoirs. Compared with many other ecosystems, near-natural peatlands are able to sequester and store above-average amounts of carbon per unit area over the long term. As a result, they also help to stabilise water quality and climatic conditions.

Across Europe, moors have lost their natural characteristics over large areas as a result of drainage for agricultural and forestry use, peat extraction, and the development of settlements and infrastructure. Furthermore, around 90 per cent of Germany's moors are used primarily as grassland, arable land or woodland. The associated drainage leads to peat loss, land subsidence and the loss of habitats typical of peatlands. Moors thus provide a prime example of the extent to which regulatory ecosystem services can be compromised by long-term changes in land use, and how the loss of natural functions increases the ecological vulnerability of landscapes.¹²



Floodplains

Floodplains are natural areas along rivers that are characterised by fluctuating water levels and, as a result, provide a wide variety of habitats for specialised animal and plant species. They are among the most species-rich ecosystems in Germany. At the same time, floodplains provide key regulatory ecosystem services: They act as natural retention basins by taking in water during floods, storing it and releasing it gradually. As a result, they make a significant contribution to flood protection and help to stabilise the landscape's water balance. Furthermore, floodplains promote groundwater recharge and improve water quality through natural filtration processes. Furthermore, floodplains are also closely linked to climatic processes: They store carbon in soils and vegetation and help to regulate regional water and temperature conditions. Intact floodplains therefore increase resilience to extreme events such as

floods and periods of drought. In Germany, however, floodplains have now been significantly altered. As a result of river straightening, dyke construction and intensive land use, large areas of the natural floodplains have been lost or cut off from the rivers. This significantly reduces their ability to fulfil their ecological and hydrological functions to the full.¹³

Freshwater

Analyses by the European Central Bank (ECB) show that water-related risks currently pose the greatest threats to economic performance in the Euro area. The ECB distinguishes between key risk categories such as surface water and groundwater scarcity, water quality, and flood and inundation risks. The scarcity of surface water is proving to be particularly significant. Under an extreme but plausible drought scenario with a statistical return period of 25 years, nearly 15 per cent of economic value added in the Euro area could be at risk. This finding highlights the high vulnerability of water-dependent economic sectors, including, in particular, agriculture, industry, energy generation, the construction industry and parts of the services sector.²

The ECB's analyses also show that water-related risks vary from region to region within the Euro area. Whilst structural water stress is primarily an issue in parts of southern Europe, the risks posed by extreme rainfall and flooding are becoming increasingly significant in other regions. This regional heterogeneity makes it difficult to carry out generalised risk assessments and highlights the importance of site-specific analyses at key production facilities. Given the extensive direct and indirect dependence of numerous economic activities on stable water resources, disruptions to the water cycle not only have local consequences but can also have macroeconomic effects through production shortfalls, supply chain disruptions and price fluctuations. This means that water is not only an environmental challenge, but also a macroeconomic risk factor, the significance of which is likely to increase further in the wake of climate change and growing demands for its use.^{2, 14}



2.2 Challenges: Data availability, measurability and complexity



Due to the complex mechanisms resulting in the loss of nature, the lack of methods and scenario standards to date, as well as a very heterogeneous data landscape, the managing nature-related risks for financial institutions are even more demanding than dealing with climate risks.^{1,2}

Diverse causes of biodiversity loss with significant interactions

Unlike climate change, which can be quantified using a single key indicator (CO₂e emissions), damage to and loss of the natural world is far more complex. IPBES identifies five direct causes: Changes in land and marine use, over-exploitation of natural resources, climate change, environmental pollution and invasive, non-native species.³ These factors interact and reinforce one another, thereby placing greater demands on data collection and analysis. At the same time, the ongoing loss of species and ecosystems is creating feedback effects that give rise to a wide variety of risks and further increase the complexity.

A lack of measurement standards and customer-specific information

Screening and analysis tools such as ENCORE⁴, IBAT⁵ and the WWF Biodiversity Risk Filter⁶ are becoming increasingly widespread in practice. Nevertheless, there is currently no standardised process that maps impacts and dependencies in a consistent and holistic manner. A key challenge is the lack of established measurement methods, such as an industry-wide recognised protocol for recording impacts and dependencies, comparable to the GHG Protocol in the climate sector. Furthermore – unlike with CO₂ data – very limited client-specific information on companies and their value chains (e.g. water consumption, land use, particulate matter emissions) is generally available for nature-related issues. Financial institutions therefore continue to rely heavily on proxy data, which is based on sector analyses and model assumptions and has only limited informative value. Nature-related phenomena are also highly location-dependent. Water stress, pollutant inputs or the condition of habitats can vary significantly even over short distances. To ensure robust assessments, there is therefore a growing need for geodata (e.g. Key Biodiversity Areas, quality data for each groundwater and surface water monitoring point, information on catchment areas or local indicators of soil quality) as well as for greater granularity in company-specific site information, ranging from the collateral situation (location of assets used to secure a loan) right down to individual production sites. The reliance on local data exacerbates the challenge of a lack of analytical methods described above, as many nature-related metrics only become meaningful when sufficient spatial resolution is achieved. Furthermore, the limited availability of location-specific data means that financial institutions often have to resort to geographical aggregates such as country- or region-level data. The associated lack of granularity makes it difficult to compare data and carry out risk modelling and tends to lead to a systematic underestimation of nature-related impacts,

dependencies and risks – a finding that the ECB also highlights in its analysis of nature-related financial risks.²

Uncertainties in scenarios and target pathways

Unlike in the climate sector, there are as yet no established nature-related scenarios with consistent sectoral target pathways. For key issues such as water availability, land-use dynamics and pollutant inputs, there is a lack of robust models that can reliably simulate biophysical developments over longer time horizons. Furthermore, tipping points in ecological systems make modelling more difficult. They mark critical thresholds beyond which developments no longer proceed linearly but in sudden, sometimes irreversible, leaps – for example, in the widespread loss of the Amazon rainforest, the collapse of the Greenland or West Antarctic ice sheets, the collapse of coral reefs, or changes in global ocean circulation. Exceeding such thresholds can abruptly alter security of supply, price trends or the attractiveness of individual business locations, and have global repercussions via supply chains. The timing, regional distribution and ecological and socio-economic consequences are difficult to predict, as – unlike with some extreme weather events such as floods, droughts or forest fires – there is often a lack of historical data for comparison.⁷

Despite scientific uncertainties, incomplete data and, in some cases, a lack of established methods, it is essential to begin nature-based analyses at an early stage. Nature-related risks arise regardless of the current level of maturity of the tools. A rapidly growing market of specialist providers is already offering practical solutions that enable nature-related factors to be taken into account in a more informed manner when making financial decisions.

It is therefore essential to adopt a pragmatic, step-by-step approach that makes use of existing data and allows for

iterative improvements, particularly in the areas of data quality and availability.



2.3 Opportunities: Nature as a field for sound financing

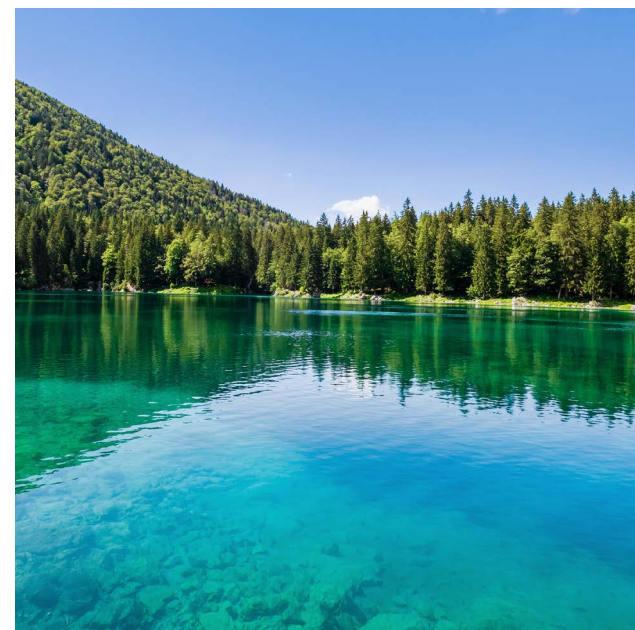
Nature-related topics present financial institutions not only with new challenges, but also with strategic development opportunities. Wherever businesses and public sector organisations invest in the restoration, protection or sustainable use of natural capital, there is a growing need for financing solutions. Increasing regulatory requirements, technological innovations and growing pressure along global supply chains mean that nature-positive business models are becoming increasingly important and new market segments are emerging.

International evidence also underscores this trend: According to the World Economic Forum (WEF), nature-positive business models are increasingly emerging as competitive, high-yield investment opportunities. The 'green economy' reached a global market capitalisation of around 8 quadrillion US dollars in 2024 and has outperformed the broader stock market by around 59 per cent since 2008. The latest WEF paper identifies over 50 investable nature-based business opportunities that are already generating revenue or delivering cost efficiencies and thus provide a clear economic case for nature-positive financing.¹⁵

Freshwater as a priority area of opportunity for DZ BANK AG

As part of its assessment of opportunities, DZ BANK AG places particular emphasis on the area of freshwater. The responsible management of water – in particular, ensuring its availability, quality and a functioning water cycle – is becoming a key issue for the future for financial institutions. The growing focus of regulators, technological advances in the water sector, and rising expectations from society, supervisory bodies and investors all highlight the strategic importance of this ecosystem. These developments open up a wide range of valuable and long-term financing opportunities for DZ BANK AG.

International frameworks also emphasise this importance: The TNFD identifies freshwater as one of four priority ecosystems for nature-based analyses and highlights a wide range of nature-based opportunities.¹⁶ Furthermore, the WEF explicitly identifies water-related solutions as a growing area for investment and highlights specific, commercially viable business models that reduce water consumption, pollution and costs whilst simultaneously increasing corporate resilience. This means that freshwater is not only recognised as a risk factor, but also as a strategic area for investment in which environmental improvements and economic opportunities are closely interlinked. This presents DZ BANK AG with the opportunity to make targeted use of the freshwater sector as a market opportunity: To work with customers to implement financing solutions in the context of freshwater and to explore the introduction of new solutions.



Opportunities related to nature, using phosphate recovery as an example

Since 2019, the EU has classified phosphorus as a “critical raw material”, as it is indispensable to key industries and the EU is almost entirely dependent on imports. Elemental phosphorus (P₄) is no longer produced in Europe; the EU is almost entirely dependent on supplies from China, Vietnam and Kazakhstan. Yet phosphorus is essential for batteries, semiconductors, electronics, renewable energy and flame retardants. The options for substitution are extremely limited, which further increases the supply risk. At the same time, wastewater contains significant quantities of phosphorus, which can be lost through conventional disposal methods. However, sewage sludge from wastewater treatment can be used to produce organic fertiliser. This process returns phosphorus and other nutrients to the agricultural cycle, whilst at the same time reducing the burden on landfill sites. This creates a close link between water management and agriculture. Recycling phosphate from wastewater also helps to safeguard the quality of freshwater. Less sewage sludge in landfill sites means a lower risk of groundwater contamination. At the same time, sustainable fertilisers are being produced which reduce the demand for mineral phosphates and strengthen the circular economy in agriculture. It is estimated that up to 40 per cent of Germany’s phosphorus requirements could be met through recycling from sewage sludge. Against the backdrop of increasing regulatory requirements for wastewater treatment, this development particularly affects customers in the water and wastewater sector. Operators of sewage treatment works will face an increased need for adaptation and investment, as phosphorus recovery processes will increasingly form part of wastewater treatment in future and will need to be integrated into existing processes accordingly.^{16, 17, 18, 19}

DZ BANK AG is thus broadening its focus on nature-related aspects beyond the mere risk perspective: Natural capital is regarded as a strategically important area for investment, in which environmental improvements, regulatory requirements and economic prospects interact. On this basis, it becomes possible to specifically identify nature-related opportunities and, in collaboration with the co-operative banks and customers, translate them into viable financing solutions.



Chapter 3

Strategic Direction



DZ BANK AG aims to integrate nature and biodiversity topics into its business model gradually, in a scientifically sound manner and in line with market practices. Our ambition is based on continuous capacity building, regulatory guidance and the continued development of our assessment models as knowledge evolves.

The Sustainable Development Goals (SDGs) provide a key framework for mapping sustainability-related impacts. Since 2020, DZ BANK AG has been systematically assessing the positive and negative impacts of its business activities against the SDGs. The aim is to effectively integrate nature-related aspects into the business model in the long term and to prepare at an early stage for increasing market and regulatory requirements.

To manage nature-related topics effectively, DZ BANK AG focuses on three interlinked objectives that set the strategic course:

(1) Reducing and avoiding negative impacts step-by-step

Negative impacts arising from financing and investment activities should be identified, gradually reduced and – where possible – avoided. DZ BANK AG bases its approach on recognised frameworks and platforms such as the CSRD¹, TNFD² and IPBES³, which enable structured analyses of nature-related impacts. To implement this objective in practice, DZ BANK AG utilises existing internal management tools, in particular its sector principles, through which it addresses heightened nature-related risks in selected sectors and sets out clear expectations regarding environmentally and socially responsible business practices. These are reviewed regularly and further developed in the light of new findings and developments in the field of nature and biodiversity. The aim is to mitigate, at an early stage, any potentially significant negative impacts on nature along key value chains.

(2) Identifying and managing nature-related risks at an early stage

The loss of natural capital and ecosystem services can give rise to financial risks – whether physical, transition or systemic. DZ BANK AG's aim is to identify these risks at an early stage, incorporate them into risk analyses and models, and take them into account appropriately in its lending and business processes. This involves a gradual expansion of the existing risk management tools: Qualitative and quantitative assessment of nature-related risk drivers, sector-, location- and supply chain-specific analyses, indicative scenario analyses and exploratory stress tests. The aim is to make nature-related risks increasingly transparent and to integrate them into the existing risk framework – in line with regulatory expectations.

(3) Making targeted use of nature-related financing opportunities

Opportunities related to nature – for example in the fields of water management, the circular economy, renaturation, pollution reduction, infrastructure modernisation or nature-related technological innovation – should be actively incorporated into business development. Freshwater serves as a key focus area and strategic priority, as well as a guiding principle for identifying financing opportunities in collaboration with clients.

Nature-related aspects are not regarded as a separate area of focus, but are viewed as an integral part of existing sustainability, risk and business structures, in line with regulatory requirements. They complement DZ BANK AG's climate strategy and broaden the perspective to include nature-related elements. This integration strengthens the long-term resilience of the business model and enables DZ BANK AG to respond appropriately to environmental and economic developments.

The central role of freshwater in economic activities and social development is also reflected in the United Nations' Sustainable Development Goals (SDGs)⁴, particularly in SDG 6 "Clean Water and Sanitation" and SDG 14 "Life Below Water".

Both objectives address the protection and sustainable use of water-related ecosystems along the entire hydrological cycle – from freshwater resources to marine habitats. Economic activities can have a negative impact on these water-related SDGs, for example through high levels of water abstraction, the discharge of pollutants and nutrients, disruption to natural water cycles, harmful practices in the use of marine ecosystems, or through indirect effects along supply chains. Such impacts are at odds with the objectives of SDG 6 – in particular, ensuring water availability and quality – as well as with SDG 14, which aims to protect aquatic ecosystems and reduce pollution. At the same time, water-related value chains also offer potential for making positive contributions to the SDGs, for example through investment in water and wastewater infrastructure, measures to reduce pollutant discharges, or nature-based solutions to stabilise hydrological systems. Against this background, DZ BANK AG's SDG perspective serves as a complementary framework for assessing water-related impacts and development potential. It is not a substitute for a risk- or impact-based analysis, but it can help to illustrate the significance of the key theme of freshwater in the context of international sustainability goals.

SUSTAINABLE DEVELOPMENT GOALS



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Source: <https://www.un.org/sustainabledevelopment/news/communications-material/>

Chapter 4

Action fields



Based on the significance of nature, as described above, for economic stability, the specific challenges in managing nature-related risks, as well as its defined level of ambition, DZ BANK AG has identified specific action fields. Nature-related topics are not treated as a separate topic, but rather demonstrate their relevance in the context of existing risk, strategy and business processes.

Central to this is the establishment of a robust foundation through the continuous refinement of methods, processes and data sources. These enable DZ BANK AG to take nature-related aspects fully into account in its decision-making, whilst at the same time dealing in a structured manner with increasing regulatory requirements, growing data availability and rising methodological complexity. Alignment with industry standards and recognised frameworks – such as CSRD/ESRS^{1,2}, the TNFD recommendations³ and regulatory guidelines⁴ – forms a consistent frame of reference.

At the same time, effectively addressing nature-related issues requires a focus on particularly relevant subject areas. Where dependencies on ecosystem services are pronounced, regulatory dynamics are intensifying or there is a significant need for investment, such as in the field of freshwater, both risks and economic opportunities become more concentrated. In addition to the ongoing refinement of existing methods and datasets, the gradual deepening of expertise

in these key areas is supported by targeted knowledge-building and the exchange of ideas within relevant networks.

Against this backdrop, DZ BANK AG structures its key action fields around a three-pronged approach comprising the mitigation of negative nature-related impacts, the systematic integration of nature-related risks into existing risk management processes, and the realisation of nature-related opportunities where environmental relevance and economic prospects converge. These action fields form the basis for a practical, risk-appropriate and professionally sound approach to developing nature-related topics.

4.1 Impact

The impact perspective focuses on the effects of economic activities on nature and ecosystems. Potentially negative impacts should be identified, categorised and mitigated where they may result in increased pressure on nature and ecosystems. Positive impacts, on the other hand, should be identified and supported. DZ BANK AG's aim is to capture nature-related impacts not just on an ad hoc basis, but consistently across all its business activities, and to ensure they can be compared. For the purposes of technical classification, impact analyses draw on established scientific and data-based approaches that identify which types of economic activity are typically associated with adverse effects on ecosystem services. These include, amongst other things, ENCORE-based analyses that systematically map sectoral impacts and dependencies.

Negative impacts on nature arising from lending are mitigated through the bank's internal exclusion criteria and sector principles⁵, which serve as key management tools. The exclusion criteria define business areas and activities for which financing is not envisaged as a matter of principle, as they have particularly adverse effects on people, the environment or corporate governance (critical activities). These include, amongst other things, financing linked to significant threats to the environment and illegal deforestation. The former relates to projects or business activities involving high risks of biological, chemical or nuclear contamination, as well as hazardous goods, provided that the risks are not adequately mitigated. In justified exceptional cases, customer support may be provided, for example where a transformation process is underway to achieve greater sustainability. The sector principles complement this approach by setting

out general guardrails for lending in selected sectors that are particularly vulnerable from a sustainability perspective. In doing so, they address the potentially negative impacts on nature that are typical of the sector and set out expectations regarding environmentally and socially responsible business practices. This applies to dam and water infrastructure projects, the commodities industry, forestry, fishing, the maritime industry, palm oil and agriculture. Deviations from these principles are only possible in exceptional cases involving higher-level decisions.

Exclusion criteria and sector principles are continuously reviewed and refined in the light of regulatory developments, scientific findings and changing market conditions.

Furthermore, DZ BANK AG is broadening its impact perspective through cross-sector SDG mapping. This classifies the impacts of lending activities along the 17 Sustainable Development Goals⁶ and highlights the areas where potentially negative impacts may arise and where positive contributions are also possible. In particular, the nature-related goals – SDG 6 (Clean Water and Sanitation), SDG 14 (Life Below Water) and SDG 15 (Life on Land) – serve as an internationally established framework for presenting water-, land- and ecosystem-related impacts in a comparable manner across different sectors. SDG mapping does not replace impact or risk analysis of individual engagements, but it does increase transparency regarding key impact areas and areas of tension within the loan portfolio.

Taken as a whole, this creates a multidimensional perspective on impact: Technical reference frameworks such as ENCORE

support an understanding of nature-related impact relationships; exclusion criteria and sector principles set clear business guardrails for limiting negative impacts; and SDG mapping enables a comprehensive classification and further development of the impact profile in line with international sustainability goals. This synergy highlights DZ BANK AG's responsible approach to nature-related topics and, at the same time, creates a solid foundation for the future-oriented development of its lending business in line with environmental considerations.



4.2 Further development of risk management processes for the identification, assessment and management of nature-related risks

Within DZ BANK AG's lending business, the integration of nature-related risks across all risk management processes is not only a regulatory requirement but also appropriate from an economic perspective: It enables the early identification, assessment and management of potential risks, as well as appropriate monitoring using nature-related risk indicators. Analyses are used both from a broad perspective to identify potential structural vulnerabilities in the loan portfolio and, on an indicative basis, in the context of individual loan exposures. Depending on the specific application, model- and proxy data-based assessments are used alongside client- and location-specific information, where available.

DZ BANK AG has comprehensively enhanced its ESG (Environmental, Social and Governance) risk management in recent years to enable the forward-looking management of not only climate-related risks, but also nature-related risks in particular. A key development is the creation of a holistic scoring methodology specifically for nature, which enables nature-related factors to be considered in a structured manner at individual counterparty level. The Nature Score provides an indicative assessment of clients' nature-related risks. It incorporates sector-, country-, location- and supply-chain-related risk dimensions and enables potential physical and transition risks to be identified and assessed in a tailored and structured manner. The development of the Nature Score was driven in particular by the requirements set out in the EBA Guidelines on the management of ESG risks published in early 2025.⁴ In this regard, DZ BANK AG is guided by the regulatory requirements for nature-related risk management.

At the time of publication, the Nature Score is in the final stages of development and is being aligned with existing climate-related assessment approaches and integrated into credit decision-making processes.

By systematically integrating nature-related risks into its lending business, DZ BANK AG is strengthening its long-term viability: The impacts and potential dependencies of clients' business models are identified at an early stage, enabling appropriate risk-mitigation measures to be initiated.

Risk scoring is carried out across several analytical reference levels, which together provide a comprehensive picture of potential exposure to physical and transition risks. A distinction is made between direct risks arising from a company's own economic activities and indirect risks that may arise through upstream supply chains and are therefore also referred to as supply chain risks.

Direct nature-related risks are considered at three levels:

- 1a) at **sector level**, based on the typical negative impacts and dependencies of economic activities on ecosystem services,
- 1b) at **country level**, using indicators of ecosystem condition and national nature conservation standards,
- 1c) and at **site level** using data and indicators with higher spatial resolution on local ecosystem conditions (e.g. local pressures or threats) and relevant nature conservation standards.

In addition, **indirect risks along the supply chain** are analysed. These arise from dependencies on inputs from specific sectors and countries and are assessed across two additional levels:

- 2a) **Supplier sectors**, based on typical negative impacts and dependencies
- 2b) as well as **supplier countries**, based on indicators of ecosystem condition and national nature conservation standards.

Assessment of nature-related risks in lending



**Aggregated
Nature Score 1–100**
for physical &
transition risk
(**A B C D E**)

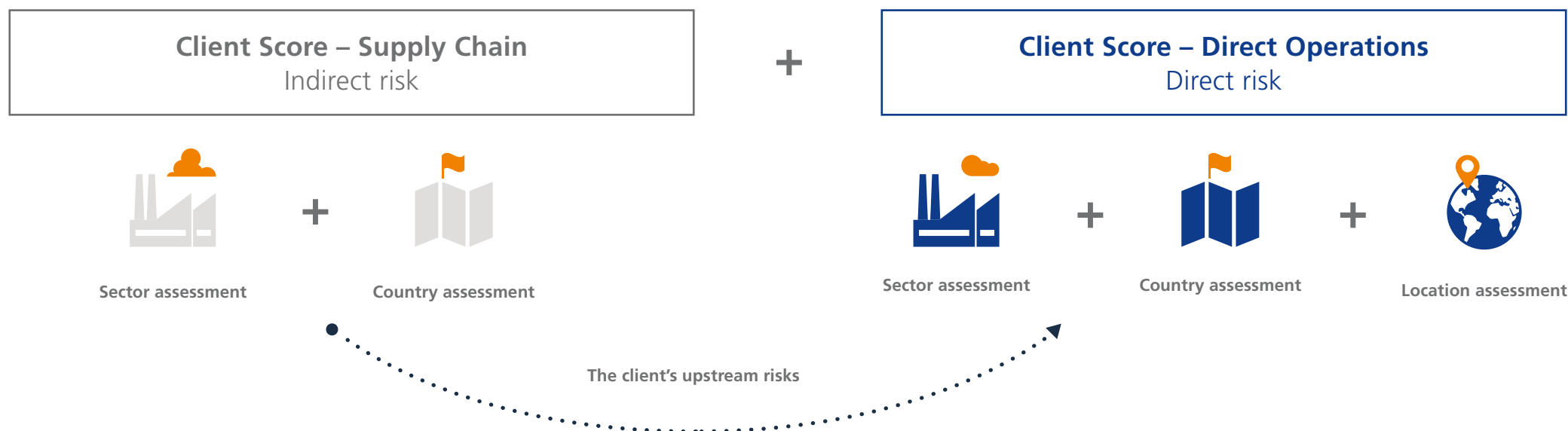


Figure: Schematic representation of the Nature Score methodology: The aggregated Nature Score combines direct nature-related risks from a client's operations with indirect risks arising from the upstream supply chain.

The assessment of the impacts and dependencies of the underlying economic activities as an indicator of transition and physical risks is based on the approach adopted by the ECB⁷, the TNFD⁸, the WWF⁹ and other established frameworks. Impacts and dependencies are considered across all levels described in the Nature Score. ENCORE data¹⁰ serve as a key technical reference, systematically recording and assessing both economic sectors' dependencies on a wide range of ecosystem services and the negative impacts of economic activities on nature at sector level, based on global averages. The ENCORE-based impact and dependency logic therefore forms the basis for the sector-level analysis (Level 1a) and serves as a reference point for the subsequent analytical levels.

As physical and transition nature-related risks can vary significantly depending on the region and the specific location of economic activity, the sector-level analysis is supplemented by additional regional and location-specific data layers.

Transition nature-related risks vary significantly across countries, as the scope and ambition of nature conservation and environmental measures differ globally. A robust assessment of these risks therefore requires a combined analysis of national transition progress and location-specific environmental conditions, as regulatory frameworks and local environmental pressures do not always coincide. Countries such as Germany can point to ambitious and advanced regulatory frameworks for water protection; at the same time, however, local pollution – for example, due to exceeded nitrate limits – can still occur, affecting companies whose activities, according to ENCORE, are linked to the emission of nutrient-based soil and water pollutants. Taking both levels into account at the same time is necessary to accurately assess the actual adaptation pressure on companies and appropriately reflect transition risks.

On the physical risk front, too, combining location- and country-specific analyses with sector data provides a more comprehensive view of region-specific hazards. If water supply in a municipality is under strain, proximity to regions facing less severe water stress may initially mitigate the risk. However, if a water-intensive company is located in an area experiencing particularly severe water scarcity and, at the same time, in a country where water stress is widespread, the immediate physical risk increases significantly.

For its country analysis, DZ BANK AG uses two established external sources: Yale University's Environmental Performance Index (EPI)¹¹ and the WWF's Biodiversity Risk Filter⁹ as analysis and screening tools. When combined, these approaches provide comprehensive coverage of virtually all relevant physical and transition nature-related risk drivers.

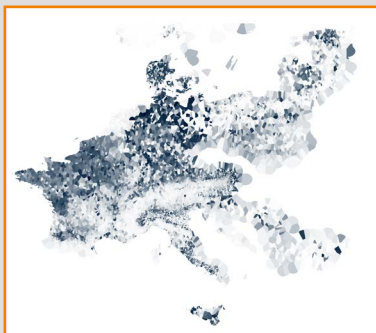
High-quality, up-to-date and publicly available datasets are already available for location analyses, which can be used to assess customers' locations with precision. As part of its location analyses, DZ BANK AG takes into account, amongst other things, risks arising from changes in land and freshwater use near biodiversity-sensitive locations, water scarcity, water pollution, particulate matter pollution, erosion, loss of pollination and declining soil quality. Conducting location analyses represents an important extension of regional analysis, as country-level data often do not adequately reflect the actual risk situation (cf. Chapter 2, Challenges).

However, both ENCORE data and country- and site-level assessments of companies only capture direct impacts and dependencies and therefore do not enable an assessment of upstream supply chain risks. The supply chain is therefore assessed in a subsequent step. To this end, DZ BANK AG draws on the ECB's methodology⁷ and combines ENCORE data with supply chain-specific information from EXIOBASE¹². In addition to sector-specific data (Nature Score Level 2a), country-specific data is incorporated into the analysis (Nature Score Level 2b). A physical or transition risk in a company's supply chain therefore generally arises from three types of information:

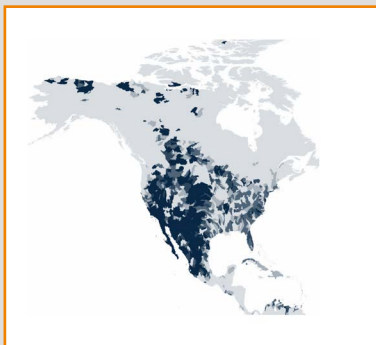
- the quantity supplied or the dependency on a supplier input (specifically, the amount in cents required to generate one euro in revenue),
- the sector risk associated with suppliers and
- the country risk associated with suppliers

The two perspectives – 'direct risk' (sector, country, location) and 'indirect risk' (supply chain risk) – are then combined to determine the client's overall risk. On average, indirect risk accounts for approximately one-third of the total score, reflecting the importance of supply chain analysis.

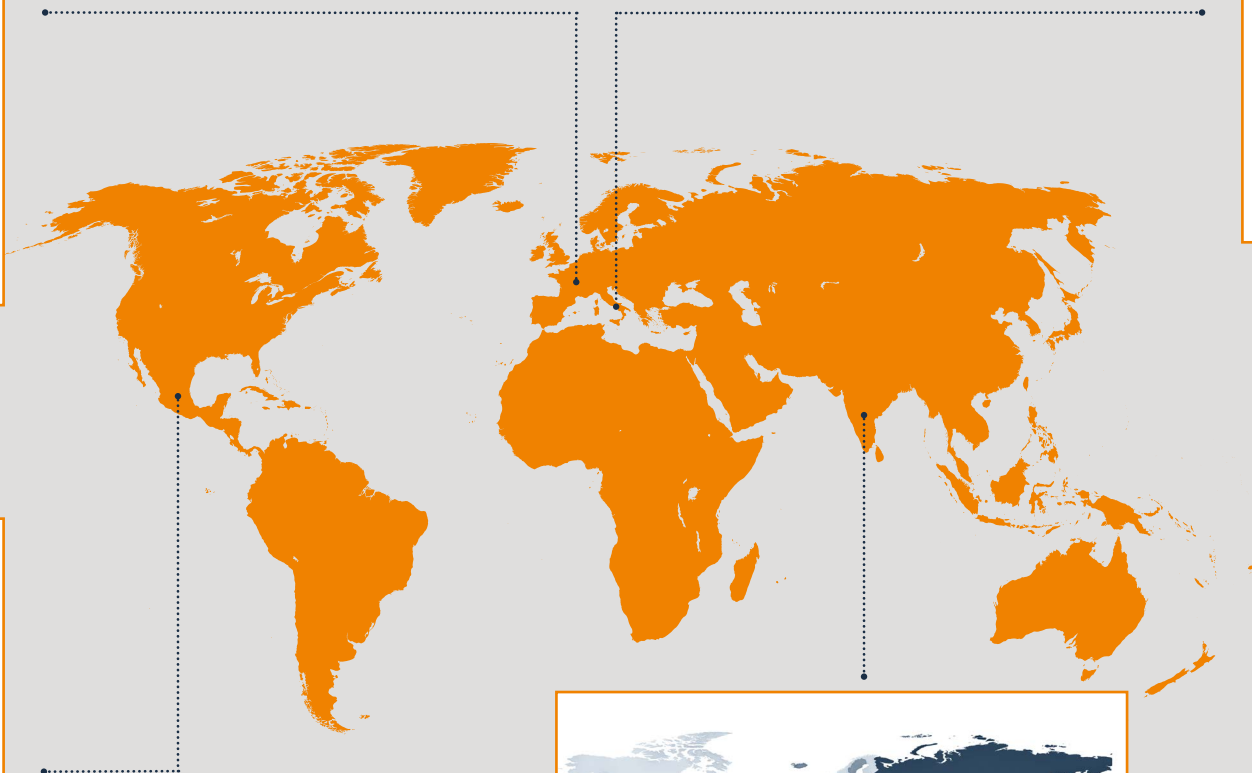
Use of nature-related indicators for nature scoring in lending, using freshwater as an example



Around one-third of all groundwater bodies and two-thirds of all surface water bodies in the EU are not in good chemical status



Water scarcity is increasing worldwide. Dry regions are particularly affected, including parts of Africa, the United States, the Middle East, Australia and Asia.



Water scarcity is also increasing in the EU, with Spain and Italy already severely affected

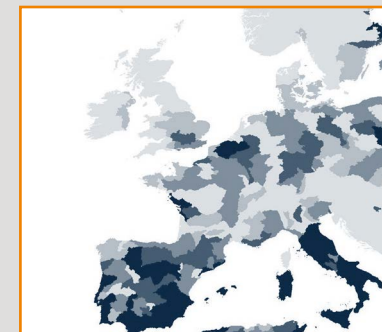
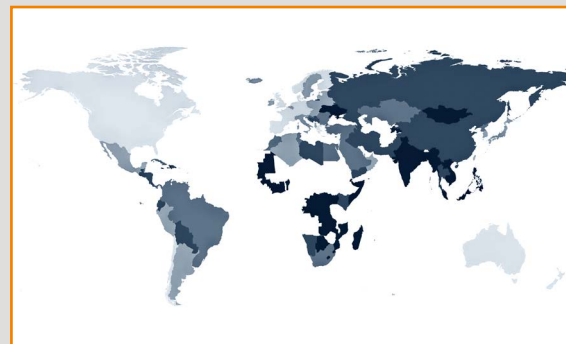


Figure: Extract of location-specific, spatially differentiated nature-related indicators used in DZ BANK AG's Nature Score, examined in greater depth using freshwater as an example; sources: Top left European Environment Agency Report and European Environment Agency Waterbase (ODC-By); top right Aqeduct ('untreated connected wastewater', CC BY 4.0); bottom left and right Aqeduct ('water stress', CC BY 4.0)



Wastewater management remains inadequate in some regions, including parts of India, and increasingly poses risks to human health.

4.3 Other action fields for DZ BANK AG with a focus on nature-related risk management

In addition to the planned integration of Nature Score, which is almost fully developed, into existing lending processes, there are further action fields, which are primarily aimed at gradually expanding the data set. At present, nature-related analyses and the Nature Score still rely to a significant extent on proxy data in the credit decision-making process. This reflects the general level of maturity in the availability of nature-related data, particularly with regard to company- and site-specific information across complex value chains. Against this background, the gradual expansion of the ESG data set to include more company-specific client data represents a key area for further development.

As part of the client dialogue, selected nature-related information is currently being collected, for example on water usage intensity or solid waste generation, and incorporated into existing assessment and scoring methods. In the long term, the nature-related database is to be improved and expanded in order to further refine client assessments and risk analyses. Building on the Nature Score methodology, risk indicators are currently being developed to monitor exposure to nature-related risks. The indicators show what proportion of clients' total loan volume is attributable to exposures with elevated nature-related risk profiles, broken down into transition risks (arising from negative impacts) and physical risks (arising from dependencies on ecosystem services). This lays the groundwork for monitoring developments over time and ensuring that nature-related risks are taken into account appropriately in the management process.

Global Risks Report

The World Economic Forum's Global Risks Report identifies environmental issues such as biodiversity loss, ecosystem collapse, extreme weather events, resource scarcity and environmental pollution as among the most serious global risks over the next ten years. Risks associated with nature are thus increasingly being recognised as structural risk factors that are set to grow in significance over the long term. Against this background, the use of scenario analyses and stress tests is becoming increasingly important. The banking supervisory authority also emphasises that significant environmental and natural risks must be analysed not only in the short term, but also over the medium and long term. The restrictions set out in section 2.1 apply here: As data, scenarios and methods are not yet sufficiently standardised, the supervisory authority is currently allowing banks more time to develop scenario analyses for nature-related risks.^{14, 15}

Freshwater

Regardless of the individual exposure of DZ BANK AG's portfolio, external analyses show that water-related risks are among the most significant physical nature-related risk drivers for the European economy. Against this background, the issue of freshwater is becoming increasingly important, not least from a risk perspective. Water availability and water quality act as cross-sectoral and cross-location risk factors and affect a wide range of economic activities.^{7, 13} Water scarcity is already a significant issue in many regions of the world today. Of particular concern is the fact that more and more regions are being affected and that water-related pressures are continuing to worsen over time. This overarching significance makes freshwater a key reference topic for the further development of nature-related analyses at DZ BANK AG, whilst also providing a substantive link to the consideration of nature-related opportunities, particularly in the area of water-related investment and financing.

4.4 Opportunities: Realising Nature-related Financing Potential

Nature-related topics not only present financial institutions with new requirements but also create valuable financing opportunities. In this action field, DZ BANK AG is focusing on how opportunities in the lending and capital markets business can be realised in practice.

A key focus is the financing of investments that contribute to the stabilisation, restoration or sustainable use of nature-related functions. These include, in particular, measures to safeguard key ecosystem functions, for example in the areas of freshwater, resource cycles, coastal and flood protection, the ecological enhancement of landscapes and urban areas, sustainable agriculture and forestry, and the protection of marine and coastal ecosystems.

Consequently, this opens up opportunities to link nature-related aspects and financing in a concrete way. One suitable approach is the use of earmarked financing instruments, such as green loans and green bonds, the proceeds of which may only be used for suitable projects or project categories with a clear environmental benefit. Furthermore, sustainability-linked financing – where the interest rate is linked to nature-related indicators and targets – can create financial incentives for sustainable business practices. Both financing options, as well as biodiversity impact funds, make it possible to combine environmental impacts with financial prospects and to gradually integrate nature-related aspects more firmly into the product portfolio. With increasing access to nature-related data, DZ BANK AG has the opportunity to increasingly apply this approach to lending and capital markets financing in the future.

Freshwater

Within the area of nature-related opportunities, DZ BANK AG places particular emphasis on the topic of freshwater. This area combines high macroeconomic relevance, regulatory dynamics and a considerable need for investment. Water availability and quality are becoming critical success factors for numerous business models. Accordingly, financing opportunities arise across a broad spectrum – ranging from the modernisation and expansion of water and wastewater systems and urban water infrastructure, through to measures in the wastewater and circular economy sectors, including efficient treatment, energy recovery and reuse, to investments in monitoring, analysis and treatment technologies – for example, to reduce pollutants and microplastics – supplemented by restoration projects and nature-based solutions for water retention and flood protection.

In the context of freshwater, too, capital market-based financing instruments are becoming increasingly important. The issue of sustainable water management is already regularly addressed in financing frameworks and corresponding issuances of promissory notes and bonds and is likely to become even more important in the future. The issuance of so-called blue bonds to finance water-related projects highlights that, alongside freshwater issues, aspects relating to the sustainable use of marine resources are also gaining a foothold in the bond market. DZ BANK AG is monitoring these developments and assessing the extent to which water-related investments can be incorporated into financing frameworks.



Urban Development & Urban Water Infrastructure



Water-conscious urban planning
(e.g. 'sponge city' concepts, river water heat pumps)



Modernisation of municipal water and wastewater systems (networks, pumping stations, control systems)



Digital leak detection & control

Wastewater & Circular Water Management



Energy recovery from sewage gas and waste heat as a key component of **energyneutral wastewater treatment plants**



Energy-efficient wastewater treatment
(aeration, pumps)



Phosphorus recovery & water recirculation systems (Reuse)

Microplastics & Pollutant Removal



Integration of additional treatment processes into existing wastewater treatment plants



Pay-per-treatment and pay-for-impact models (pollutant-based)



Expansion of **monitoring & laboratory capacity** to ensure compliance with stricter limits

Figure: A selection of diverse financing opportunities in the field of freshwater, analysed according to potential financing themes (columns).

The financing themes outlined here illustrate how nature-related opportunities can be translated into concrete investment approaches. The financing examples below show how such potential can be translated into concrete projects.

In doing so, DZ BANK AG adopts an integrated approach that considers climate and nature-related aspects together and deliberately takes their interrelationships into account, with a view to contributing to the holistic strengthening of resource conservation and environmental protection.

The following examples illustrate various ways in which nature-related investments can be financed – both through direct project financing and via capital market-based instruments.

Project financing example – river water heat pump

As part of a project financing arrangement, DZ BANK AG is funding the installation of a river water heat pump system by a municipal utility as part of a forward-looking infrastructure development in Germany. A river water heat pump uses the heat stored in the river to generate heating energy for buildings. The technology can be operated particularly efficiently, especially during the warmer months, as it requires less additional energy. Several river water heat pumps are set to ensure the supply of heat to just under 4,000 households via climate-friendly district heating. Commissioning is expected to take place in the summer of 2026. By utilising the heat from flowing water, existing fossil-fuel-fired heating systems, such as those running on gas or oil, are being gradually replaced. As these have so far emitted CO₂ during heat generation, their partial replacement could help to reduce greenhouse gas emissions. In total, the use of river water heat pumps can result in annual CO₂ savings of around 7,500 tonnes. Looking ahead, there are also plans to further develop the infrastructure for the use of green hydrogen. The water taken from the river is used exclusively for heating

purposes and is subsequently returned in its entirety to the natural water cycle. This ensures local water availability and the protection of local water resources. Furthermore, local ecosystems are not adversely affected – on the contrary: The slight drop in water temperature – by an average of around 0.2 degrees Celsius – increases the water's ability to hold oxygen, which can improve living conditions for aquatic organisms.

The use of watercourses as a heat source opens up new opportunities to further develop existing infrastructure in a way that conserves resources, whilst at the same time ensuring the sustainable management of freshwater. This approach demonstrates how freshwater resources can be integrated into technical systems in a controlled and site-specific manner, without jeopardising their long-term functionality.



Capital markets example – NRW.BANK green bond: Restoration of the Emscher

In 2024, NRW.BANK issued a green bond with a volume of €1 billion, which was structured in accordance with the ICMA's Green Bond Principles and aligns as closely as possible with the EU taxonomy. The issuance is intended to finance a wide range of sustainable projects; part of the proceeds is earmarked specifically for water and biodiversity-related projects, particularly in the areas of river restoration and sustainable water management.

A key project is the restoration of the Emscher, one of the largest river restoration projects in the European Union. For more than a century, the Emscher in the Ruhr region was used as an open sewer system, which caused considerable ecological damage. The river lost its natural structure, large parts of its flora and fauna disappeared, natural floodplains were lost and its vulnerability to flooding increased.

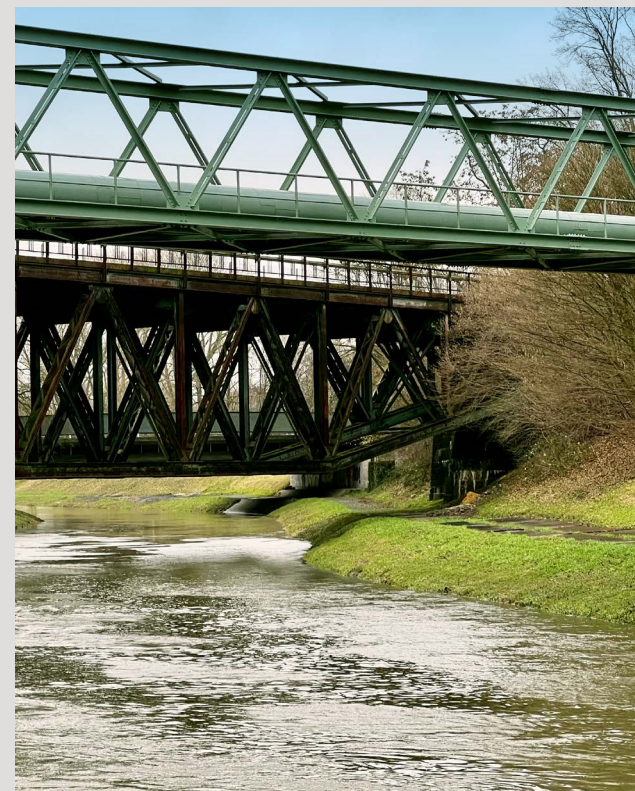
The measures supported by the green bond financing are aimed at restoring key ecological functions of the river system. These include the restoration of the Emscher to a near-natural water-course, the improvement of water quality, the creation of new

habitats, and the restoration of natural water retention and discharge processes. This both strengthens ecological functions and increases the resilience of the surrounding residential and economic areas to extreme weather events.

DZ BANK AG acted as a co-structuring partner through its capital markets business. It supported the placement, thereby facilitating access to investor funds – including for this nature-related project – without acting as a direct project financier itself. This example thus demonstrates how nature-related investments can be made accessible to a wider range of investors via capital market-based instruments and integrated into existing green finance structures as part of a green bond's overall allocation.

Taken as a whole, the perspective on nature-related aspects extends beyond the mere risk perspective. Natural capital is regarded as a strategically important area for investment, in which environmental requirements, regulatory frameworks and economic development potential interact.

As the central institution of the Genossenschaftliche FinanzGruppe, DZ BANK AG is able to structure and co-finance projects and support clients in implementing projects compatible with nature. This has a twofold effect: On the one hand, such financing helps to stabilise and restore ecological functions; on the other hand, it strengthens the adaptability and resilience of nature-dependent business models.



Chapter 5

Commitments and Memberships

A woman in a white polka-dot shirt is standing and presenting to a group of people seated around a long conference table. The room has large windows overlooking a city skyline. The seated individuals are looking towards the presenter. There are papers and a laptop on the table.

Commitments and memberships relating to nature are an effective strategic tool. DZ BANK AG has long been committed to internationally recognised sustainability standards. With the signing of the Equator Principles in 2013, a clear initial signal was sent that environmental and social aspects form an integral part of responsible financing. In addition, DZ BANK AG subsequently joined further initiatives and expanded its presence in relevant international and national dialogue formats. In this way, its commitment to sustainability has been systematically deepened and institutionally embedded.

Involvement in initiatives, working groups and dialogue forums

DZ BANK AG is currently represented in a wide range of nature-related industry initiatives, partnerships and working groups. These include, amongst others, the UN Global Compact and the Principles for Responsible Banking. The Equator Principles also remain a key framework of reference. Furthermore, DZ BANK is committed to market-wide voluntary initiatives such as the ICMA Green Bond Principles and contributes its expertise to the ICC Commission on Environment and Energy.

At national level, the bank is involved in the Association for Environmental Management and Sustainability in Financial Institutions (VfU) and in the Sustainable Finance Cluster Germany, including the 'Cluster Initiative Nature' working group. This is complemented by DZ BANK AG's involvement in the VÖB Sustainable Finance Commission, as well as its memberships in the Genoverband's Sustainability Council and Forum Nachhaltige Geldanlagen. The bank also participated in the German Government's Sustainable Finance Advisory Board. Furthermore, DZ BANK AG is a member of the German TNFD Consultation Group and contributes to the VÖB's thematic area Nature.¹

Another important milestone was DZ BANK's accession to the European Biodiversity Coalition (EBC) in 2025. The decision to join was made in light of DZ BANK AG's existing commitments and signals the further development of nature within the overall strategy.



Figure: An illustrative overview of DZ BANK AG's voluntary commitments and memberships, as at May 2026

Relevance of selected initiatives in the field of nature

By taking part in these initiatives, the Bank is pursuing clearly defined objectives. The focus is on the continuous transfer of knowledge and the systematic development of in-house expertise to further advance this field. At the same time, the aim is to achieve greater standardisation, in particular by identifying practical, customer-focused solutions. Active involvement also provides early insight into regulatory developments and their implications, as well as enabling the identification of business opportunities, for example by recognising relevant trends and new market requirements. In addition, market developments are monitored systematically, particularly with regard to their relevance to clients and their specific needs.

The TNFD is particularly relevant to the conceptual development of the nature-related topic. It provides a framework for addressing fundamental questions of orientation, as well as an opportunity for DZ BANK AG to test its own approaches and implementation considerations. As a member of the TNFD Consultation Group Germany, DZ BANK AG gains early insights into conceptual developments as well as regulatory and market expectations. This lays the foundations for further developing internal governance capabilities and strengthening the organisation's position vis-à-vis regulators, investors and the market.

The application and signing of various voluntary commitments are based on a structured set of criteria. The following factors are taken into account: strategic fit, reputational impact, peer adoption, impact on nature, networking potential, longevity and the effort required for implementation (taking into account synergies with regulatory requirements and other activities). This ensures that voluntary commitments are selected in a targeted manner and implemented in accordance with the relevant requirements.

Participating in existing industry initiatives such as the VÖB and the Sustainable Finance Cluster is a key factor in the success of further developing the field of biodiversity and nature. The VÖB provides a well-established platform for structured dialogue with other member institutions. Particularly with regard to methodological issues, collaboration enables the efficient further development of approaches and reduces the individual workload involved in development. At the same time, dialogue within the association promotes consistency in approaches across the sector and helps to ensure a coordinated stance towards regulators and other stakeholders.

The Sustainable Finance Cluster complements this exchange by bringing a more substantive and strategic perspective to it. The focus is on building knowledge together, coordinating positions and identifying business opportunities in the field of nature. By pooling expertise and jointly developing solutions, relevant developments can be anticipated at an early stage and integrated into the organisation's own strategic direction.

Use and impact

Active participation in such initiatives is already yielding tangible results and contributing to the further development of the market. For example, as part of industry platforms such as the VÖB, practical contributions have been produced which demonstrate how nature-related aspects can be integrated into business models and used to generate economic value. Cross-sector publications, such as those produced by the Sustainable Finance Cluster, also make important contributions to knowledge and guidance regarding the integration of biodiversity into the German financial market. Overall, these initiatives enhance transparency, foster a shared understanding and promote the establishment of best practices.

Internally, these initiatives play a key role in further developing methods, processes and strategic positioning within the context of nature. In particular, they serve as a framework for assessing and prioritising potential voluntary commitments and help to sharpen the Bank's positioning in the market. Ongoing dialogue, for example within the VÖB, enables risk trends to be assessed at an early stage and enables DZ BANK AG to compare its own approaches with market standards. Particular emphasis is placed on the systematic integration of relevant initiatives into existing processes, particularly in the lending business. In this way, established frameworks such as the Equator Principles are specifically integrated where they can add value to risk analysis and management. In addition, sector principles and risk assessments are regularly reviewed in comparison with other market participants in order to ensure the robustness of the bank's own approaches.

Input for processes, management and business development

Furthermore, these initiatives lead to concrete input that is incorporated into internal processes.

These include, in particular:

- the identification and use of suitable data sources for measuring nature-related impacts and risks,
- the structured assessment of potential voluntary commitments, including benchmarking against competitors,
- the development and testing of nature-related KPIs (quantitative and qualitative), currently still at the exploratory stage, as well as
- impetus for new business areas, for example in the field of adaptation financing or nature-based finance instruments (e.g. Nature Credits).

Integration, knowledge embedding and internal scaling

DZ BANK AG's participation in initiatives and partnerships is cross-divisional and clearly embedded within the organisation. The strategy function plays a key role in this regard, particularly the Sustainability Department, which is responsible for both the substantive management and the strategic assessment of these findings, and thus also acts as a central point for the internal use of the insights gained. In addition, selected business units are closely integrated: Within the Capital Markets division, the Institutional Clients unit in particular focuses on bond-related initiatives, whilst staff from the Structured Finance division are primarily involved in relation to the Equator Principles. Other departments contribute to the relevant formats on an ad hoc basis, depending on the topic's relevance.

The insights gained from these initiatives are systematically incorporated and disseminated throughout the organisation via established internal structures. These include, in particular, cross-functional projects and programmes, as well as regular reporting and discussions within central committees in which the units involved are actively engaged. In this way, external input and experience are directly integrated into internal decision-making and management processes, thereby ensuring that knowledge is embedded in the long term and can be scaled across the Bank.

Chapter 6

Governance, Roles and Responsibilities



Integrating nature into the overall strategy, ESG governance and organisational structure

Sustainability is an integral part of DZ BANK AG's overall strategy. Accordingly, the governance of nature-related topics is embedded within the existing ESG governance framework. Nature-related aspects are addressed within the existing sustainability, risk and business structures and managed in close integration with climate-related aspects. DZ BANK AG is thus acting in line with its fundamental approach of addressing environmental factors holistically and integrating them into existing management and decision-making structures. This approach is in line with supervisory expectations, such as the EBA guidelines¹ and the ECB Guide on climate-related and environmental risks², according to which environmental factors must be treated in an integrated manner rather than in a fragmented way.

Overall responsibility for ESG topics, including nature, lies with the Management Board of DZ BANK AG. Strategic ESG matters are assigned to the Management Board member responsible for strategy, while responsibility for ESG risks, including nature-related risks, lies with the Management Board member responsible for risk. This ensures that nature is reliably addressed at the strategic level, in risk management and in client business. At the operational level nature-related topics are managed within DZ BANK AG's established sustainability organisation. Although, compared with climate-related issues, the field of nature is still at a less advanced stage of development overall – particularly in terms of data availability and methodological standardisation – it is nevertheless managed by the same units and advanced in line with the same implementation and development approach.

The Group Sustainability Committee (GSC) is the central committee of the DZ BANK Group, comprising members of the Management Board. Nature-related topics are reported, discussed and decided upon in the GSC. Among other things,

the GSC examined in greater depth nature-related business opportunities, as well as impact and risk analyses for selected focus sectors: agriculture and food production, electricity generation, and real estate and construction. For specific functional issues – such as ESG market opportunities or ESG risks and regulatory matters – topics are also raised in other functional committees, such as the Group Risk and Finance Committee.

Responsibilities for nature-related topics can be divided into three areas:

- (1) Strategy: At a strategic level, nature is integrated into the overarching sustainability and business strategy. This includes the assessment, support and further development of relevant engagements, initiatives, voluntary commitments, guidelines and policy documents, as well as the strategic analysis of nature-related developments and business opportunities. In 2025, for example, nature-related business opportunities were identified and discussed as part of the strategic planning process.
- (2) Risk: The risk perspective encompasses, in particular, the further methodological development of nature-related risk instruments; the integration of nature-related aspects into existing risk management processes, such as risk inventory, credit processes, stress testing, ICAAP and risk strategy; and internal reporting on ESG risks, including nature-related risks.
- (3) Market: At market and business level, the focus is on monitoring relevant market and technology trends in the field of nature, identifying and supporting nature-related financing opportunities, and providing expert input on nature-related issues in client business.

This clear allocation of responsibilities ensures that nature-related topics are managed in a strategically consistent and operationally effective manner.

A key milestone in embedding nature within the organisation was the inclusion of this topic in the bank-wide sustainability programme (NH Programme). From 2025 onwards, fundamental conditions for embedding nature from a technical, methodological and organisational perspective were established within the programme. The programme-specific governance structures are due to be phased out at the end of June 2026, while the topics addressed are being permanently transferred to DZ BANK AG's established governance structures. As a successor to the NH Programme's existing steering committee, a Sustainability Board is to be established at DZ BANK AG in the second half of 2026.



Management Board of DZ BANK AG

Overall responsibility for ESG topics, including nature-related topics at DZ BANK AG and establishment of the governance framework for ESG topics, including nature-related topics at DZ BANK Group

Sustainability Board

Central ESG steering committee for decision-making, prioritisation and monitoring of ESG topics, including nature-related topics, at DZ BANK AG

Group Sustainability Committee

Central ESG steering committee for decision-making, prioritisation and monitoring of ESG topics, including nature-related topics, within the DZ BANK Group

Other Committees with Functional Responsibilities

Strategy

Integration into the sustainability and business strategy, guidelines, commitments

Risk

Integration into risk management: credit processes, stress testing, ICAAP, etc.

Market

Implementation in client business, financing opportunities, market developments

Figure: Nature as an integral part of DZ BANK AG's ESG governance – an overview of responsibilities, committees and organisational logic

ESG management reporting ensures transparency right up to Management Board level

Reporting on ESG issues is carried out in a structured and regular manner via an ESG management report submitted to the Management Board twice a year. This forms a key foundation for management and governance transparency and covers, amongst other things, progress towards achieving the Sustainable Development Goals (SDGs)³, including the nature-related goals, SDG 14 (Life below water) and SDG 15 (Life on land). This assessment is based on the cross-sectoral SDG mapping of the lending business, supplemented by selected capital market components, which classifies the impacts of financing along the 17 SDGs and thereby highlights key impact areas and potential areas of tension within DZ BANK AG's loan portfolio (cf. Chapter 4).

Use and further development of existing steering approaches

At DZ BANK AG, nature-related aspects are managed through the targeted further development of existing steering approaches. This applies in particular to the ongoing development and refinement of nature-related elements in credit analysis, the review and further development of sector principles, and the increasing integration of climate and nature perspectives.

As part of this further development, the plan is to align nature- and climate-related assessment approaches more closely in the long term, in order to facilitate a consistent understanding of environmental factors. For example, Nature and Climate Scores (see Chapter 4, Risk Management) could be used in an aggregated form in future. At the level of data architecture, scenario analyses and stress tests, common foundations are increasingly being evaluated and developed. At present, DZ BANK AG is still in a phase of transparency and learning,

during which nature-related risks are systematically identified, reported on and assessed in qualitative terms and – where data permits – in quantitative terms. The aim of this phase is to lay a sound foundation for the appropriate and permanent integration of nature-related risks into DZ BANK AG's established decision-making and management processes.

Conclusion: At DZ BANK AG, the governance of nature-related topics is clearly embedded within the existing ESG, risk and strategy architecture. Responsibilities, committees and steering approaches are in place and are being further developed in a targeted manner. The aim is to ensure that nature-related aspects are consistently taken into account throughout key standard processes – from the identification of impacts, risks and opportunities right through to strategic portfolio management. Key factors in this regard are the gradual expansion of the methodological approach and the close integration of nature-related topics with issues concerning business model and portfolio resilience, in close alignment with existing climate governance.

Chapter 7

Outlook



The growing importance of the topic of nature is an expression of a deeper underlying development: Economic systems are highly dependent on functioning ecosystems – ranging from the availability of water and raw materials through to stable yields, right up to resilient supply chains. These natural foundations are coming under increasing pressure worldwide. The continuing degradation of ecosystems thus increases not only environmental, but also economic vulnerabilities and leads to nature becoming an increasingly relevant factor for business models, value chains and long-term economic stability.

Against this backdrop, the responsibility of the financial sector is growing. Upon the adoption of the Kunming-Montreal Global Biodiversity Framework¹ at the COP15, the global community undertook to systematically address nature-related impacts and risks and to steadily bring financial flows into line with the attainment of targets for biodiversity and ecosystems (Target 15). DZ BANK AG is fully aware of its responsibility and positions itself as a part of this development – with the aim to limit negative impacts through exclusion

criteria and sector principles, to manage nature-related risks in line with regulatory requirements and to accompany relevant developments in the context of nature-related transformations.

For DZ BANK AG, this means increasingly treating nature-related aspects as a cross-cutting topic. Risks that arise, for instance, from the deterioration of water quality, the scarcity of natural resources or from disruption to ecological pro-

cesses will be increasingly reflected in lending decisions, portfolio evaluations as well as scenario analyses and stress tests. Nature-related aspects thus become a further test of the resilience of business models.

At the same time, new economic opportunities are opening up. The growing need for investment in water infrastructure, efficiency technologies, the circular economy and nature-based solutions is opening up financing opportunities across key areas of transformation. The circular economy, in particular, is gaining in strategic importance, including in the context of European initiatives such as the Bioeconomy Strategy². For DZ BANK AG, this opens up opportunities in the lending and capital markets business, for example in the areas of waste recovery, bio-based materials and integrated water and nutrient cycles.

At DZ BANK AG, the further development of nature-related financing and products is deliberately carried out in a step-by-step and iterative manner. Existing instruments can be supplemented with nature-related aspects; innovative approaches, such as thematic financing focusing on water, are being monitored and assessed. It is reasonable to assume that the requirements regarding data quality, analytical capabilities and the management of nature-related issues – not least against the backdrop of regulatory and legislative developments – will continue to rise. Nature is thus becoming increasingly important as a risk dimension, an area for investment and a strategic dimension of sustainable finance. In line with this approach, DZ BANK AG combines its central role in the financial system as the central institution of the Volksbanken Raiffeisenbanken Cooperative Financial Group with an overarching responsibility for ensuring stable economic and environmental conditions and pursues the aim of integrating nature-related topics appropriately into existing structures, managing risks proactively and responsibly developing economic potential.



List of Figures and Sources for all Chapters

List of abbreviations Chapter 1

EBA: European Banking Authority
EEA: European Environment Agency
ESRS: European Sustainability Reporting Standards
ECB: European Central Bank
CSRD: Corporate Sustainability Reporting Directive
IPBES: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
GFG: Cooperative financial network
GBF: Kunming-Montreal Global Biodiversity Framework
TNFD: Task Force on Nature-related Financial Disclosures
WRI: World Resources Institute

List of Sources Chapter 1

- ¹ IPBES: The Global Assessment Report on Biodiversity and Ecosystem Services – Summary for Policymakers
- ² The Task Force on Nature-related Financial Disclosures
- ³ IPBES: The methodological assessment report on the impact of business on biodiversity and nature's contributions to people, and business's dependence on them – Summary for policymakers
- ⁴ IPBES: Press Release – Business and Biodiversity Assessment
- ⁵ World Resources Institute: Aqueduct 4.0: Updated Decision-Relevant Global Water Risk Indicators
- ⁶ European Environment Agency: Water scarcity in Europe
- ⁷ GBF: 2030 Targets
- ⁸ BMUKN: National Biodiversity Strategy
- ⁹ ESRS E4: Biodiversity and Ecosystems
- ¹⁰ Federal Environment Agency: Corporate environmental reporting
- ¹¹ EBA: Final Guidelines on the Management of ESG Risks
- ¹² EBA: Final Report on Environmental Scenario Analysis

List of abbreviations Chapter 2

ECB: European Central Bank
TNFD: Task Force on Nature-related Financial Disclosures
WEF: World Economic Forum

List of Sources Chapter 2

- ¹ TNFD: Recommendations for upgrading the nature data value chain for market participants
- ² European Central Bank: Occasional Paper Series: Nature at Risk: Implications for the euro area economy and financial stability
- ³ IPBES: The Global Assessment Report on Biodiversity and Ecosystem Services – Summary for Policymakers
- ⁴ ENCORE
- ⁵ IBAT
- ⁶ WWF Biodiversity Risk Filter
- ⁷ University of Exeter: Global Tipping Points Report
- ⁸ TNFD: Guidance on the identification and assessment of nature-related issues – The TNFD LEAP approach
- ⁹ The Equator Principles
- ¹⁰ EBA: Final Guidelines on the Management of ESG Risks
- ¹¹ University of Exeter: Global Tipping Points Report
- ¹² Federal Agency for Nature Conservation: Moors
- ¹³ Federal Agency for Nature Conservation: Floodplains
- ¹⁴ European Central Bank: The ECB Blog – The European economy is not immune to drought
- ¹⁵ World Economic Forum: 50 Investment Opportunities for a New Nature Economy
- ¹⁶ TNFD: Discussion paper on nature-related opportunities
- ¹⁷ European Commission: Critical raw materials
- ¹⁸ European Sustainable Phosphorus Platform
- ¹⁹ EU-Community Wastewater Directive

List of abbreviations Chapter 3

CSRD: Corporate Sustainability Reporting Directive
IPBES: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
SDGs: Sustainable Development Goals
TNFD: Taskforce on Nature-related Financial Disclosures

List of Sources Chapter 3

- ¹ EUR-Lex: CSRD Directive
² TNFD: Guidance on the identification and assessment of nature-related issues – The TNFD LEAP approach
³ IPBES
⁴ United Nations: Sustainable Development Goals

List of abbreviations Chapter 4

ESG: Environmental, Social and Governance (ESG)
ICMA: International Capital Market Association
KRIs: Key Risk Indicators
SDGs: Sustainable Development Goals

List of Sources Chapter 4

- ¹ EUR-Lex: CSRD Directive
² ESRS E4: Biodiversity and Ecosystems
³ TNFD: Guidance on the identification and assessment of nature-related issues – The TNFD LEAP approach
⁴ EBA: Final Guidelines on the Management of ESG Risks
⁵ DZ BANK: Exclusion criteria and sectoral principles
⁶ United Nations: Sustainable Development Goals
⁷ European Central Bank: Occasional Paper Series: Nature at Risk: Implications for the euro area economy and financial stability
⁸ TNFD: Guidance on the identification and assessment of nature-related issues – The TNFD LEAP approach
⁹ WWF Biodiversity Risk Filter
¹⁰ ENCORE
¹¹ Environmental Performance Index
¹² EXIOBASE
¹³ European Central Bank: The ECB Blog – The European economy is not drought-proof
¹⁴ World Economic Forum: Global Risks Report 2026
¹⁵ EBA: Final Report on Environmental Scenario Analysis

List of abbreviations Chapter 5

ICMA: International Capital Market Association

List of Sources Chapter 5

- ¹ DZ BANK: Commitments and Memberships

List of abbreviations Chapter 6

ESG: Environmental, Social and Governance (ESG)
GSC: Group Sustainability Committee
SDGs: Sustainable Development Goals

List of Sources Chapter 6

- ¹ EBA: Final Guidelines on the Management of ESG Risks
² ECB: Guide on climate-related and environmental risks
³ United Nations: Sustainable Development Goals

List of abbreviations Chapter 7

COP15: 2022 UN Biodiversity Conference in Canada
CSRD: Corporate Sustainability Reporting Directive

List of Sources Chapter 7

- ¹ GBF: 2030 Targets
² Federal Ministry of Research, Technology and Space: EU Bioeconomy Strategy