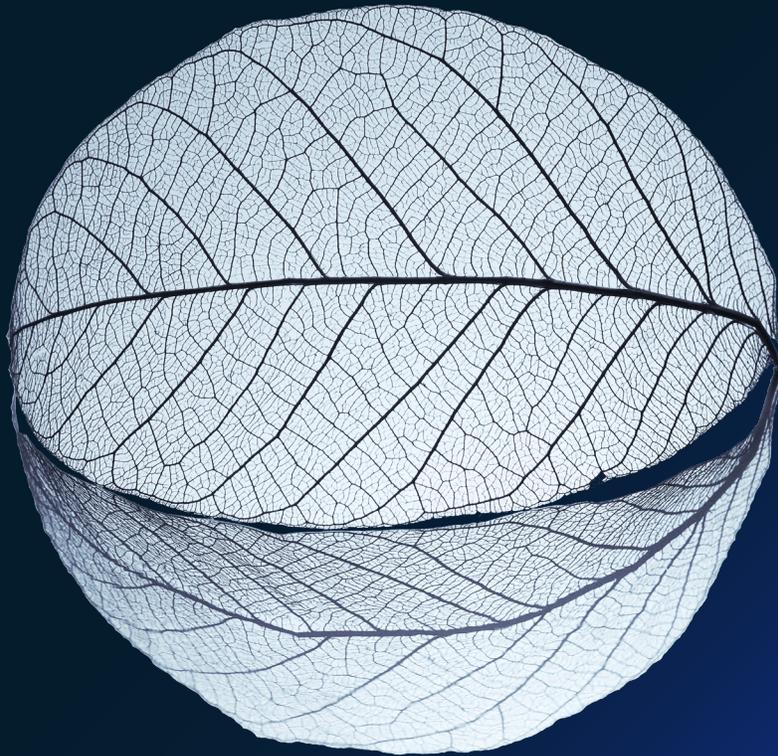


Risk Practice

Banking imperatives for managing climate risk

More than regulatory pressure is driving banks to manage climate risk. Financing a green agenda is also a commercial imperative—but specialized skills are needed to protect balance sheets.

by Joseba Eceiza, Holger Harreis, Daniel Härtl, and Simona Viscardi



The surface temperature of the Earth has risen at a record pace in recent decades, creating risks to life, ecosystems, and economies. Climate science tells us that further warming is unavoidable over the next decade, and probably after that as well. In this uncertain environment, banks must act on two fronts: they need both to manage their own financial exposures and to help finance a green agenda, which will be critical to mitigate the impact of global warming. An imperative in both cases is excellent climate-risk management.

The physical risks of climate change are powerful and pervasive. Warming caused by greenhouse gases could damage livability and workability—for example, through a higher probability of lethal heat waves. Global warming will undermine food systems, physical assets, infrastructure, and natural habitats. The risk of a significant drop in grain yields—of 15 percent or more—and damage to capital stock from flooding will double by 2030. In aggregate, we expect that around a third of the planet’s land area will be affected in some way.¹

Disruptive physical impacts will give rise to transition risks and opportunities in the economy, including shifts in demand, the development of new energy resources, and innovations arising from the need to tackle emissions and manage carbon, as well as necessary reforms in food systems. Sectors that will bear the brunt include oil and gas, real estate, automotive and transport, power generation, and agriculture. In oil and gas, for example, demand could fall by 35 percent over the next decade. The good news is that these changes should also precipitate a sharp decline in emissions.

January 2020 was the warmest January on record. As temperatures rise in this way, it is incumbent on banks to manage the relevant risks and opportunities effectively (Exhibit 1).

Furthermore, regulation increasingly *requires* banks to manage climate risk. Some have made a start, but many must still formulate strategies, build their capabilities, and create risk-management frameworks. The imperative now is to act decisively

¹ This estimate is based on a higher-emission scenario of RCP (Representative Concentration Pathway) 8.5 CO₂ concentrations (Intergovernmental Panel on Climate Change, a UN body). Lethal heat waves are defined as a wet-bulb temperature of 35° Celsius, at which level the body-core temperatures of healthy, well-hydrated human beings resting in the shade would rise to lethal levels after roughly five hours of exposure. Estimates are subject to uncertainty about aerosol levels and the urban heat-island effect. For further details, see the McKinsey Global Institute report “Climate risk and response: Physical hazards and socioeconomic impacts” (January 2020).

Exhibit 1

Climate change creates opportunities and challenges for the banking industry.

Opportunity: Financing a green agenda



Transformation of energy production toward renewables



Plant refurbishments to avoid or capture and store carbon emissions



Electrification of transport and automation of mobility

Up to \$500 billion in annual adaptation costs¹

Challenge: Protecting balance sheets from uncertainty



Real-estate market collapse in low-lying areas



Increased risk of major crop failures with implications for meat and dairy producers



Closures of coal-powered power plants before end of useful life

For banks in the European Union, up to 15% of the balance sheet is at risk²

¹ Costs until 2050, according to the UN *Adaptation Gap Report* (2018).

² Based on analysis of 46 sample EU banks and their portfolio composition in industries and geographies likely affected by physical and transition risks.

The regulatory agenda

Regulatory initiatives that require banks to manage climate risks have gathered pace over the recent period (exhibit).

The United Kingdom's Prudential Regulation Authority was among the first to set out detailed expectations for governance,

processes, and risk management. These require banks to identify, measure, quantify, and monitor exposure to climate risk and

Exhibit

Regulation is evolving at high speed.

Regulation timeline

Task Force on Climate-Related Financial Disclosures (TCFD)

Recommendations for disclosures in climate-risk-management approach and risk exposures

European Banking Authority

Guidance planned on the following topics:

- Regulatory expectations for management of environmental, social, and governance (ESG) risks
- Standards for ESG disclosures in Pillar 3 reporting
- Methodology for EU-wide climate stress-testing program and guidance for banks' own testing
- Guidelines on inclusion of ESG risks into supervisory framework

2017	2018	2019	2020	2021	2022	2023	2024	2025
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Bank of England

- Supervisory statement on embedding climate risks into risk-management framework
- Draft methodology for comprehensive climate stress-testing program

European Commission

Disclosure recommendations on climate risks, building on TCFD framework

BaFin¹

Expectations for integrating sustainability risks within risk-management framework

¹Bundesanstalt für Finanzdienstleistungsaufsicht.

to ensure that the necessary technology and talent are in place. Germany's BaFin¹ has followed with similar requirements.

Among upcoming initiatives, the Bank of England plans to devote its 2021 Biennial Exploratory Scenario (BES) to the financial risks of climate change. The BES imposes requirements that will probably force many

institutions to ramp up their capabilities, including the collection of data about physical and transition risks, modeling methodologies, risk sizing, understanding challenges to business models, and improvements to risk management. The European Banking Authority (EBA) is establishing regulatory and supervisory standards for environmental, social, and

governance (ESG) risks and has published a multiyear sustainable-finance action plan. The EBA may provide a blueprint for authorities in geographies including the United States, Canada, and Hong Kong, which are also considering incorporating climate risk into their supervisory regimes.

¹ Bundesanstalt für Finanzdienstleistungsaufsicht.

and with conviction, so effective climate-risk management will be an essential skill set in the years ahead.

Regulatory and commercial pressures are increasing

Banks are under rising regulatory and commercial pressure to protect themselves from the impact of climate change and to align with the global sustainability agenda. Banking regulators around the world, now formalizing new rules for climate-risk management, intend to roll out demanding stress tests in the months ahead (see sidebar “The regulatory agenda”). Many investors, responding to their clients’ shifting attitudes, already consider environmental, sustainability, and governance (ESG) factors in their investment decisions and are channeling funds to “green” companies.

The commercial imperatives for better climate-risk management are also increasing. In a competitive environment in which banks are often judged on their green credentials, it makes sense to develop sustainable-finance offerings and to incorporate climate factors into capital allocations, loan approvals, portfolio monitoring, and reporting. Some banks have already made significant strategic decisions, ramping up sustainable finance, offering discounts for green lending, and mobilizing new capital for environmental initiatives.

This increased engagement reflects the fact that climate-risk timelines closely align with bank risk profiles. There are material risks on a ten-year horizon (not far beyond the average maturity of loan books), and transition risks are already becoming real, forcing banks, for example, to write off stranded assets. Ratings agencies, meanwhile, are incorporating climate factors into their assessments. Standard & Poor’s saw the ratings impact of environmental and climate factors increase by 140 percent over two years amid a high volume of activity in the energy sector.

As climate risk seeps into almost every commercial context, two challenges stand out as drivers of engagement in the short and medium terms.

Protecting the balance sheet from uncertainty

As physical and transition risks materialize, corporates will become increasingly vulnerable to value erosion that could undermine their credit status. Risks may be manifested in such effects as coastal real-estate losses, land redundancy, and forced adaptation of sites or closure. These, in turn, may have direct and indirect negative impact on banks, including an increase in stranded assets, uncertain residual values, and the potential loss of reputation if banks, for example, are not seen to support their customers effectively. Our analysis of portfolios at 46 European banks showed that, at any one time, around 15 percent of them carry increased risk from climate change. The relevant exposure is mostly toward industries (including electricity, gas, mining, water and sewerage, transportation, and construction) with high transition risks.

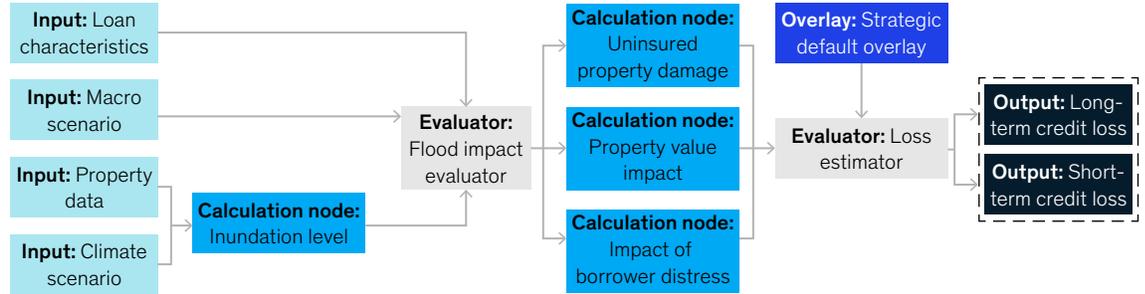
When we looked at the potential impact of floods on mortgage delinquencies in Florida, for example, we gathered flood-depth forecasts for specific locations and translated them into dollar-value damage levels. The analysis in Exhibit 2 is based on geographic levels associated with specific climate scenarios and probabilities. We then used these factors to generate numbers for depreciation and the probability of default and loss-given default. Based on the analysis, we calculated that more frequent and severe flooding in the Miami–Dade region may lead to an increase in mortgage defaults and loss rates close to those seen at the peak of the financial crisis and higher than those in extreme stress-test projections. Our severe-flooding scenario for 2030 predicts a 2.53 percent loss rate, just a bit lower than the 2.95 percent rate at the peak of the financial crisis. However, in the event of an economic slowdown, the rate could go as high as 7.25 percent.

Financing a green agenda

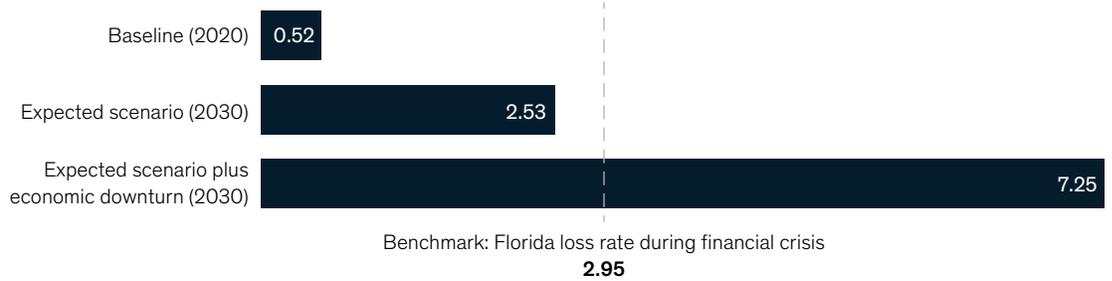
Renewable energy, refurbishing plants, and adaptive technologies all require significant levels of financing. These improvements will cut carbon emissions, capture and store atmospheric carbon, and accelerate the transition away from fossil fuels. Some banks have already acted by redefining their

This model was developed to measure the impact of flooding on Florida home-loan markets.

Estimation of loss in loan levels



Projected loss rates for Miami mortgage portfolio, %



goals to align their loan portfolios with the aims of the Paris Agreement.²

Oil and gas, power generation, real estate, automotive, and agriculture present significant green-investment opportunities. In the United Kingdom, for example, 30 million homes will require sizable expenditure if they are to become low-carbon, low-energy dwellings.³ In energy, opportunities are present in alternatives, refining, carbon capture, aviation, petrochemicals, and transport. As some clients exit oil and coal, banks have a role in helping them reduce their level of risk in supply contracts or in creating structured finance solutions for power-purchase agreements.

In renewables, significant capital investment is needed in energy storage, mobility, and recycling.

A sharper lens: Five principles for climate-risk management

As they seek to become effective managers of climate risk, banks need to quantify climate factors across the business and put in place the tools and processes needed to take advantage of them effectively. At the same time, they must ensure that their operations are aligned with the demands of external stakeholders. Five principles will support this transformation. They should be applied flexibly as the regulatory landscape changes.

² The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping any global temperature rise this century well below 2 degrees Celsius above preindustrial levels and to pursue efforts to limit the temperature increase even further to 1.5° Celsius.

³ Angela Adams, Mary Livingstone, and Jason Palmer, "What does it cost to retrofit homes? Updating the cost assumptions for BEIS's energy efficiency modelling," UK Department for Business, Energy & Industrial Strategy, April 2017; assets.publishing.service.gov.uk.

Formulate climate-risk governance. It will be of crucial importance for top management to set the tone on climate-risk governance. Banks should nominate a leader responsible for climate risk; chief risk officers (CROs) are often preferred candidates. To ensure that the board can keep an eye on exposures and respond swiftly, banks should institute comprehensive internal-reporting workflows. There is also a cultural imperative: responsibility for climate-risk management must be cascaded throughout the organization.

Tailor business and credit strategy. Climate considerations should be deeply embedded in risk frameworks and capital-allocation processes. Many institutions have decided not to serve certain companies or sectors or have imposed emissions thresholds for financing in some sectors. Boards should regularly identify potential threats to strategic plans and business models.

Align risk processes. To align climate-risk exposure with risk appetite and the business and credit strategy, risk managers should inject climate-risk considerations into all risk-management processes, including capital allocations, loan approvals, portfolio monitoring, and reporting. Some institutions have started to develop methodologies for assessing climate risk at the level of individual counterparties (see sidebar “A leading bank incorporates climate risk into its counterparty ratings”).

Counterparty credit scoring requires detailed sectoral and geographic metrics to interpret physical and transition risks as a view of financial vulnerability, taking into account mitigation measures. The resulting risk score can be used to inform credit decisions and to create a portfolio overview. The score can also be embedded in internal and external climate-risk reporting, such as responses to the disclosure recommendations of the Financial Stability Board (Task Force on Climate-Related Financial Disclosures) or the European Banking Authority (Non-Financial Risk Disclosure Framework).

Get up to speed on stress testing. Scenario analyses and stress tests, which are high on business and regulatory agendas, will be critical levers in helping banks assess their resilience. In preparing for tests, they should first identify important climate hazards and primary risk drivers by industry, an analysis they can use to generate physical and transition-risk scenarios. These in turn can help banks estimate the extent of the damage caused by events such as droughts and heat waves. Finally, banks have to quantify the impact by counterparty and in aggregate on a portfolio basis. Risk-management teams should also prepare a range of potential mitigants and put in place systems to translate test results into an overview of the bank’s position. Since regulators are prioritizing stress testing for the coming period, acquiring the necessary climate-modeling expertise and climate-hazard and asset-level data is an urgent task.

Focus on enablers. Banks often lack the technical skills required to manage climate risk. They will need to focus on acquiring them and on developing a strategic understanding of how physical and transition risks may affect their activities in certain locations or industry sectors. Banks usually need “quants,” for example—the experts required to build climate-focused counterparty- or portfolio-level models. They should therefore budget for increased investment in technology, data, and talent.

Reaching for risk maturity: Three steps

As banks ponder how to incorporate climate-change considerations into their risk-management activities, they will find that it is important to remain pragmatic. The climate issue is emotive. Stakeholders want robust action, and banks feel pressure to respond. Those that make haste, however, increase the risk of missteps. The best strategy is adequate, comprehensive preparation: a bank can create a value-focused road map setting out an agenda fitted to its circumstances and taking into account both the physical and regulatory status quo. Once the road map is in place, banks should adopt a

A leading bank incorporates climate risk into its counterparty ratings

A leading international bank aimed to increase its share of climate markets. To get there, it needed to incorporate climate factors into the risk-management function and to develop tools for assessing climate risks, on the counterparty level, for its entire portfolio.

The bank aimed to assess climate risk for each of its 2,500 counterparties on an annual basis, and its solution had

to be sufficiently simple and scalable for individual loan officers to use on counterparties of all sizes. The eventual solution was based on the production of scorecards for physical and transition risks (exhibit).

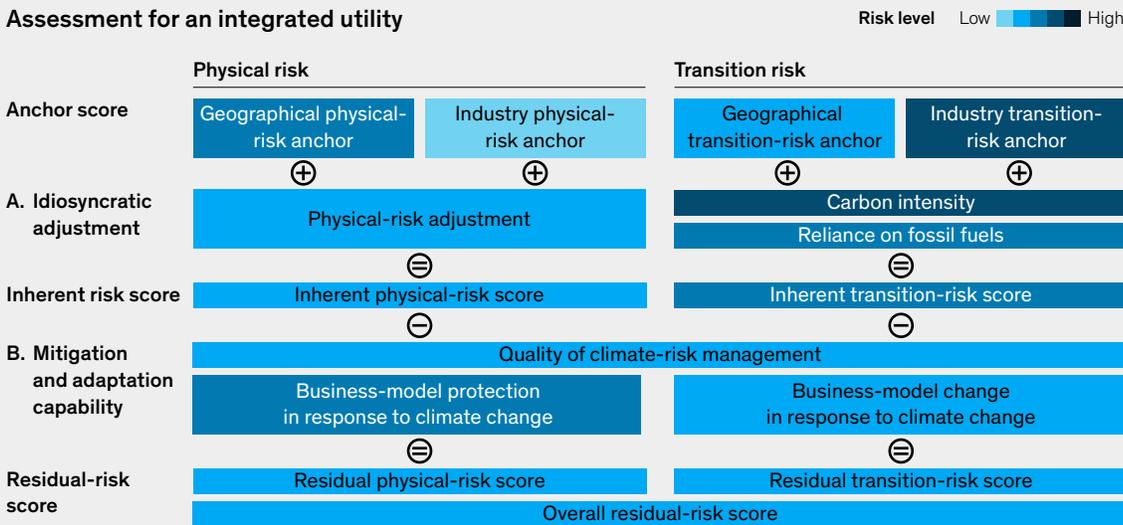
The bank's calculations were predicated on anchor scores that reflected the counterparty's industry and geographical footprint. These were adjusted for

idiosyncratic effects to reflect transition risk arising from a company's greenhouse-gas emissions or the reliance of its business model on fossil fuels and related products. Additional parameters helped assess the potential for mitigation and adaptation—including a qualitative assessment of the company's climate-risk management, actions to protect physical assets from future physical hazards, and initiatives to adopt a more sustainable business and

Exhibit

An international banking group embedded climate risk into counterparty ratings.

Assessment for an integrated utility



operating model. The final output of the calculations was a counterparty rating that incorporated inputs from physical and transition-risk scorecards.

The counterparty model was useful to differentiate the climate risk among companies within sectors. Testing for the bank's utilities subportfolio, for example, showed that electricity providers and

multi-utilities fared worse than regulated networks. Companies with a higher proportion of renewables generally fared better.

One concern during model development was the shortage of available climate data and climate-related corporate information. The bank had to strike a balance between model accuracy and feasibility. Finally,

it decided to work largely with publicly available data selectively augmented with climate-hazard data. As the bank developed, tested, and rolled out the methodology, cross-functional teams emerged as a success factor. These teams consisted of model developers, analysts, economists, and climate experts.

modular approach to implementation, ensuring that investments are tied to areas of business value by facilitating finance, offering downside protection, and meeting external expectations.

For developing a comprehensive approach to risk management, we see three key steps, which should be attainable in four to six months.

1. Define and articulate your strategic ambition

Effective climate-risk management should be based on a dedicated strategy. Individual banks must be sure about the role they want to play and identify the client segments and industry sectors where they can add the most value. They should also establish and implement governance frameworks for climate risk—frameworks that include the use of specialized senior personnel, as well as a minimum standard for reporting up and down the business.

Some are already taking action. One financial institution made its CRO the executive accountable for climate change and head of the climate-change working group. Another institution divided these responsibilities among the board of directors, executive management, business areas, group functions, and the sustainable-finance unit. Banks should also factor in adjacencies because lending to some clients in riskier geographies and industries—even to finance climate-related initiatives—is still riskier. This will ensure that banks formulate a structured approach to these dilemmas.

2. Build the foundations

Banks should urgently identify the processes, methodologies, and tools they will need to manage climate risk effectively. This entails embedding climate factors into risk and credit frameworks—for example, through the counterparty-scoring method described above. Scenario analyses and stress tests will be pillars of supervisory frameworks and should be considered essential capabilities. Outcomes should be hardwired into reporting and disclosure

frameworks. Finally, banking, like most sectors, does not yet have the climate-risk resources it needs. The industry must therefore accumulate skills and build or buy relevant IT, data, and analytics.

3. Construct a climate-risk-management framework

Banks must aim to embed climate-risk factors into decision making across their front- and back-office activities and for both financial and nonfinancial risks (including operational, legal, compliance, and reputational risks). Data will be a significant hurdle. Data are needed to understand the fundamentals of climate change as well as the impact it will have on activities such as pricing, credit risk, and client-relationship management. However, a paucity of data should not become an impediment to action. As far as possible, banks should measure climate exposures at a number of levels, including by portfolio, subportfolio, and even transaction. This will enable the creation of heat maps and detailed reports of specific situations where necessary. In corporate banking, this kind of measurement and reporting might support a climate-adjusted credit scorecard (covering cash flows, capital, liquidity diversification, and management experience) for individual companies. Banks may then choose to assign specific risk limits. Indeed, some banks have already moved to integrate these types of approaches into their loan books.

As intermediaries and providers of capital, banks play a crucial role in economic development that now includes managing the physical and transition risks of climate change. The task is complex, and the models and assumptions needed to align the business with climate priorities will inevitably be revised and refined over time. However, as temperatures rise, speed is of the essence in managing the transition to a more sustainable global economy.

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