CLIMATE CHANGE
MANAGING A NEW FINANCIAL RISK

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EXECUTIVE SUMMARY

As scientists continue to reinforce the severity of climate change, the potential disruption and financial implications have come to the forefront. The bankruptcy of the major Californian utility PG&E, dubbed "the first climate-change bankruptcy" by *The Wall Street Journal*,[1] is the most recent example. Banks cannot afford to ignore this global issue.

The impact of climate change will prompt substantial structural adjustments to the global economy. Several sectors, such as coal and steel, are expected to experience significant disruption, while others such as renewables, carbon capture, and adaptation technologies are likely to benefit. Such fundamental changes will inevitably impact the balance sheet and the operations of banks, leading to both risks and opportunities. While mortgage portfolios in coastal areas may be exposed to the physical impact of climate change through rising sea levels and flooding, massive amounts of capital and new financial products will be required to fund the transition and finance climate resilience, creating demand for bank services. Meanwhile, regulators are beginning to act, and investors, clients, and civil society are looking for actions, mitigation, adaptation, and transparency on the issue.

With the growing recognition of the financial stakes, rising external pressures, and upcoming regulations, *how should banks and specifically their risk management teams manage climate risks?*

In order to effectively manage climate risks and protect banks from its potential impact, institutions should treat climate risk as a financial risk—moving beyond traditional approaches that focus on reputational risk. This shift implies integrating climate risk into financial risk management frameworks and expanding the responsibility and capabilities beyond Corporate Social Responsibility (CSR) to also include risk management teams.

Our paper presents key takeaways and industry perspectives from a global survey we recently conducted in partnership with the International Association of Credit Portfolio Managers (IACPM) (Box 1):

1. Banks should treat climate risk as a financial risk, not just as a reputational one.
2. Banks should integrate climate considerations into financial risk management.

We aim to help banks integrate climate risks and opportunities within their organization and provide guidance on the implementation of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) recommendations.[2] While focused on banks, many of the main conclusions of this paper also apply more broadly to financial institutions and to corporates.

1 PG&E: *The First Climate-Change Bankruptcy, Probably Not the Last,"* Wall Street Journal, January 18, 2019.

2 *Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)*, June 2017.

BOX 1

FINANCIAL SERVICES INDUSTRY SURVEY ON CLIMATE RISK AWARENESS

ACROSS 45 GLOBAL FINANCIAL INSTITUTIONS

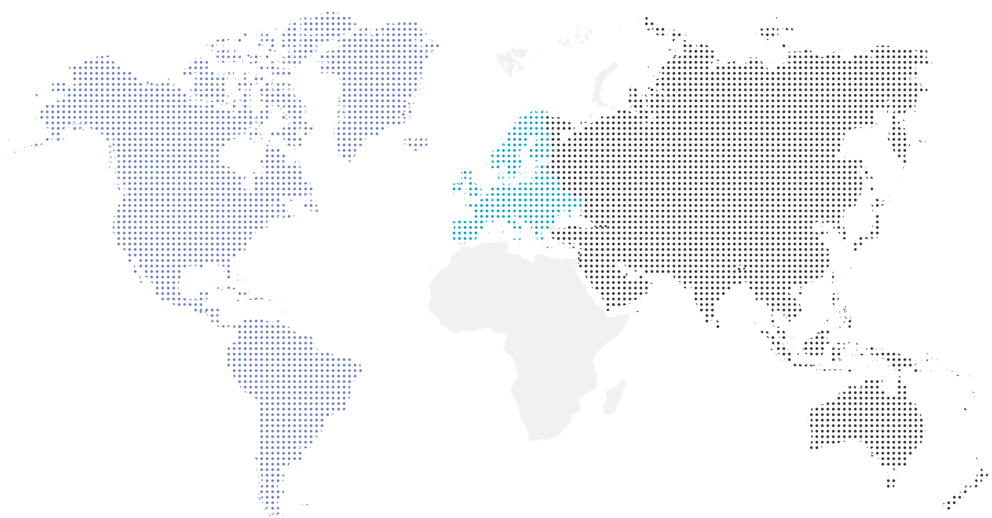
Conducted by Oliver Wyman and IACPM

Respondents overview, geographical distribution

N=45

AMERICAS / 18 BANKS

Banco Itaú-Unibanco
Bank of America
Bank of Montreal
Capital One
Citigroup
Export Development Canada
Goldman Sachs
IFC
JPMorgan Chase
KeyBank
National Bank Financial
PNC
Regions Bank
Royal Bank of Canada
Scotiabank
Sun Life Financial
TD Bank
Wells Fargo



EUROPE / 18 BANKS

ABN AMRO Bank NV
Allied Irish Banks
Barclays
BBVA
Caixabank
Credit Agricole CIB
Credit Suisse
Deutsche Bank
DNB Bank ASA
Finnvera
HSBC
Intesa Sanpaolo
Lloyds Banking Group
Natixis
Rabobank
Standard Chartered
UBS AG
UniCredit Group S.p.A.

ASIA AND AUSTRALIA / 9 BANKS

Asia Development Bank
Commonwealth Bank of Australia
DBS
Development Bank of Japan
Macquarie Group
MUFG Bank, Ltd.
National Australia Bank
OCBC Bank
UOB Ltd.

Source: Oliver Wyman/IACPM Survey (November 2018)

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KEY TAKEAWAY 1

BANKS SHOULD TREAT CLIMATE RISK AS A FINANCIAL RISK, NOT JUST AS A REPUTATIONAL ONE

Historically, banks have approached climate change through the lens of Corporate Social Responsibility (CSR). Climate risk assessments have often focused on managing the impact of a bank's operations and financings on the environment, considering the bank's responsibilities as a "corporate citizen," and by extension, aiming to safeguard the bank's reputation. With increasingly high financial stakes and growing external pressures, the pure CSR approach is no longer sufficient. Climate change has become a financial risk for banks and must be treated as such.

BANKS FACE HIGH FINANCIAL STAKES

The financial stakes arising from climate change can be high, both from a risk and opportunity perspective.

In addition to operational and market risks, climate change can lead to increased credit risks for banks, as demonstrated by the recent PG&E bankruptcy. Mortgage portfolios, for instance, can be impacted by climate-linked physical risks either through persistent, chronic changes in the environment or specific acute perils. Climate change can lead to an increase in storms, flooding, and mudslides. Increased expectations of these acute events can subsequently impact property values and defaults, posing a credit risk. In parallel, the need to transition to a low-carbon economy implies that certain wholesale portfolios such as coal mining, power generation, and oil and gas may be exposed to transition risks (Box 2). The implementation of a carbon tax, for instance, could severely impact the profitability of some of these companies.

BOX 2

TRANSITION VS. PHYSICAL RISKS

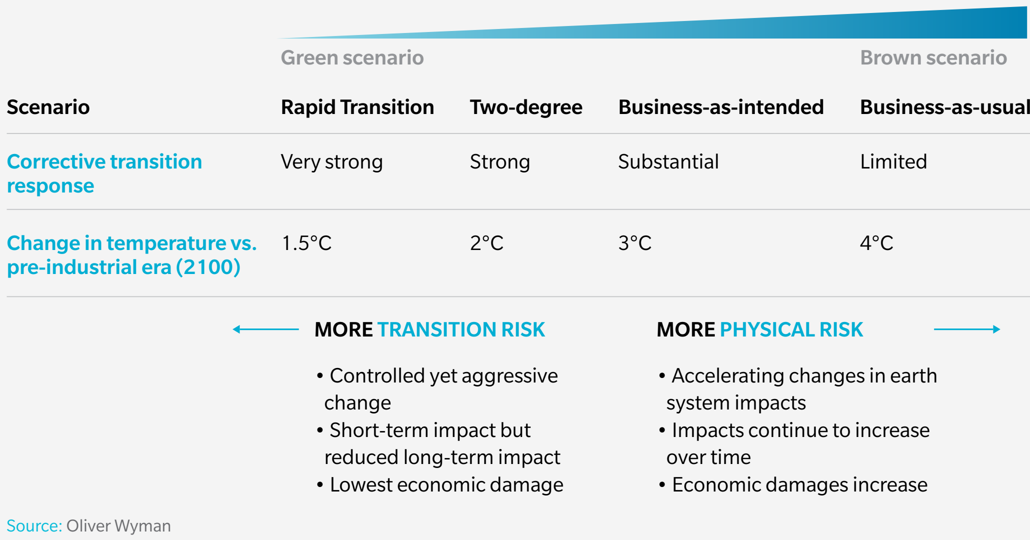
Climate risks are often grouped into two categories: physical and transition risks.

Physical risks are the risks associated with the physical effects of climate change. They include "changes in water availability, sourcing, and quality; food security; and extreme temperature changes affecting organizations' premises, operations, supply chain, transport needs, and employee safety" (TCFD). They may also include legislative and other risks that stem from these hazards, like changes in land use rules that arise from flooding or storms.

On the other hand, **transition risks** are the risks associated with the transition to a low-carbon economy. According to the TCFD, they "may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change."

Depending on the corrective response, several climate scenarios can unfold over the next years and decades (Exhibit 1). A strong and immediate corrective action, such as the wide implementation of a carbon tax, would create transition risks for certain carbon-intensive industries and minimize the physical impact. However, with a limited corrective response, the physical effects of climate change will become more prominent.

Exhibit 1: Climate scenarios and high-level implications (example)



	Green scenario			Brown scenario
Scenario	**Rapid Transition**	**Two-degree**	**Business-as-intended**	**Business-as-usual**
Corrective transition response	Very strong	Strong	Substantial	Limited
Change in temperature vs. pre-industrial era (2100)	1.5°C	2°C	3°C	4°C

Source: Oliver Wyman

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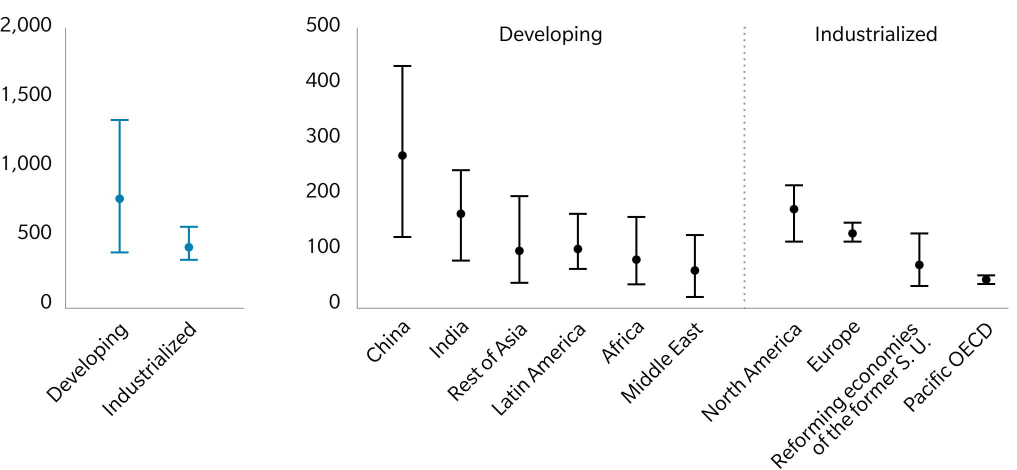
While climate change may pose new and detrimental risks, associated opportunities can be significant. For instance, the same low-carbon transition which threatens the coal mining, power generation, and oil and gas industries would require trillions of dollars in new financing (Exhibit 2), with the majority in the power generation sector.

Exhibit 2: Climate change investment opportunities

Annual investment in renewable energy, nuclear energy, and efficiency required for a 2°C scenario

USD BN/year; 2010–2050



Range of required investment • Average annual investment across models

Source: McCollum D, et al, "Energy investments under climate policy: A comparison of global models," Climate Change Economics, Vol 4, No.4, (2013).

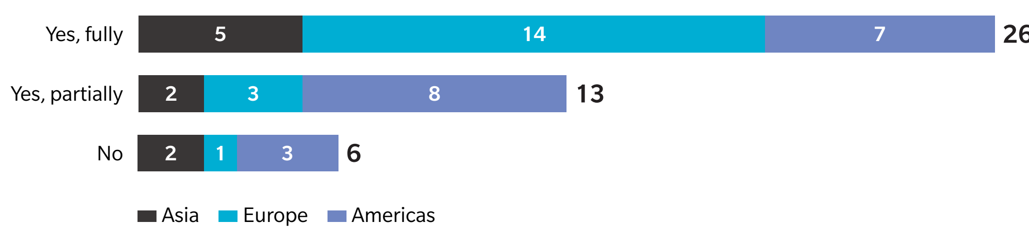
Opportunities are significant for banks, for example a low-carbon transition would require trillions of dollars in new financing.

RISING PRESSURE FOR FINANCIAL DISCLOSURE

While heightened risks and opportunities may motivate banks to proactively address climate risks, exogenous pressures may also factor into an institution's decision to act on climate change. Many new initiatives push corporates to disclose their exposures to climate, led by a range of stakeholder groups including investors and civil society. The purpose of the disclosure initiatives is to generate new sources of information for market actors and policymakers and influence the allocation of capital to, *in fine*, facilitate the transition to a more sustainable, low-carbon economy. The Task Force on Climate-Related Financial Disclosures (TCFD), established by FSB Chair and Bank of England Governor Mark Carney and Michael Bloomberg, is among the noteworthy list of initiatives. The TCFD has gained traction following the publication of a set of recommendations in June 2017,[3] which aim to develop voluntary, consistent climate-related financial risk disclosures for companies to provide information to stakeholders. Hundreds of global leaders across the globe, including major banks (Exhibit 3), have signed onto these recommendations and have started a multi-year journey to implement them (Exhibit 4).

3 *Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)*, June 2017.

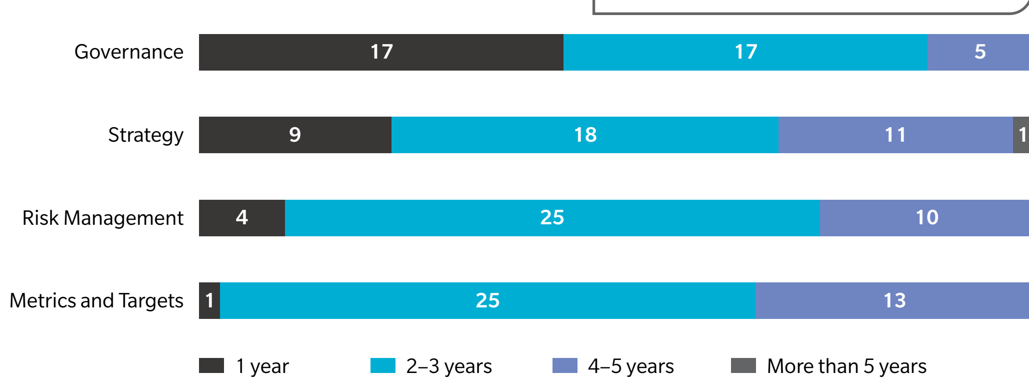
Exhibit 3: Does your institution plan to implement the TCFD recommendations?



Source: Oliver Wyman/IACPM Survey (November 2018)

Exhibit 4: How long do you expect it will take for your company to implement the TCFD recommendations (excluding ongoing activities)?

Implementing the TCFD recommendations is a multi-year journey.



Source: Oliver Wyman/IACPM Survey (November 2018)

REGULATORS ARE BEGINNING TO ACT

Beyond self-electing to participate in climate risk assessment and disclosures, banks may also face pressure from regulators seeking to evaluate their climate risk management practices. The Bank of England's Prudential Regulation Authority (PRA) is at the forefront of this movement in proposing supervisory expectations[4] on climate risk management. The proposed supervisory expectations include incorporating risks related to climate change into the risk management framework, raising the issue to the board-level, and performing climate scenario analysis (Exhibit 5). The PRA is not alone as central banks and supervisors, including the Central Banks and Supervisors Network for Greening the Financial System (NGFS),[5] are also moving ahead on climate risk management.

4 Prudential Regulation Authority, Consultation Paper, 23/18, *"Enhancing banks' and insurers' approaches to managing the financial risks from climate change,"* October 2018.

5 Banque de France: Network for Greening the Financial System: https://www.banque-france.fr/en/financial-stability/international-role/network-greening-financial-system.

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Exhibit 5: Extract of the Prudential Regulation Authority's draft supervisory statement

"ENHANCING BANKS' AND INSURERS' APPROACHES TO MANAGING THE FINANCIAL RISKS FROM CLIMATE CHANGE"

	Area	Expectations (extract)
	Governance	• Evidence of how the firm monitors and manages the financial risks from climate change in line with its risk appetite statement (...), which should include risk exposure limits and thresholds (...) • The board (...) should identify and allocate responsibility to the relevant existing Senior Management Function(s) • The board (is expected to) ensure adequate resources and sufficient skills and expertise are devoted to managing the financial risks from climate change
	Risk management	• Incorporate the financial risks from climate change into existing financial risk management practice • Identify, measure, monitor, manage and report on (...) exposure to these risks • Include (...) any material exposures relating to the financial risks from climate change in the Internal Capital Adequacy Assessment Process (ICAAP)
	Scenario analysis	• Address a range of outcomes relating to different transition paths to a low-carbon economy, and a path where no transition occurs • The scenario analysis should, where appropriate, include: – A short-term assessment (...)and a longer-term assessment, based on the current business model – Scenarios where the market transition to a low-carbon economy occurs in an orderly manner, or not
	Disclosure	• Ensure (disclosures) reflect the firm's evolving understanding of the financial risks from climate change

Source: Prudential Regulation Authority

Regulators are moving ahead on climate risk management.

In consideration of the financial stakes and rising external pressures, it is clear that banks can no longer ignore the financial risks associated with climate change. Treating climate risk as a financial risk requires adopting a comprehensive, firm-wide approach to the issue, with active engagement from all levels of the firm, up to the board of directors. Banks will need to integrate climate considerations into their financial risk management frameworks.

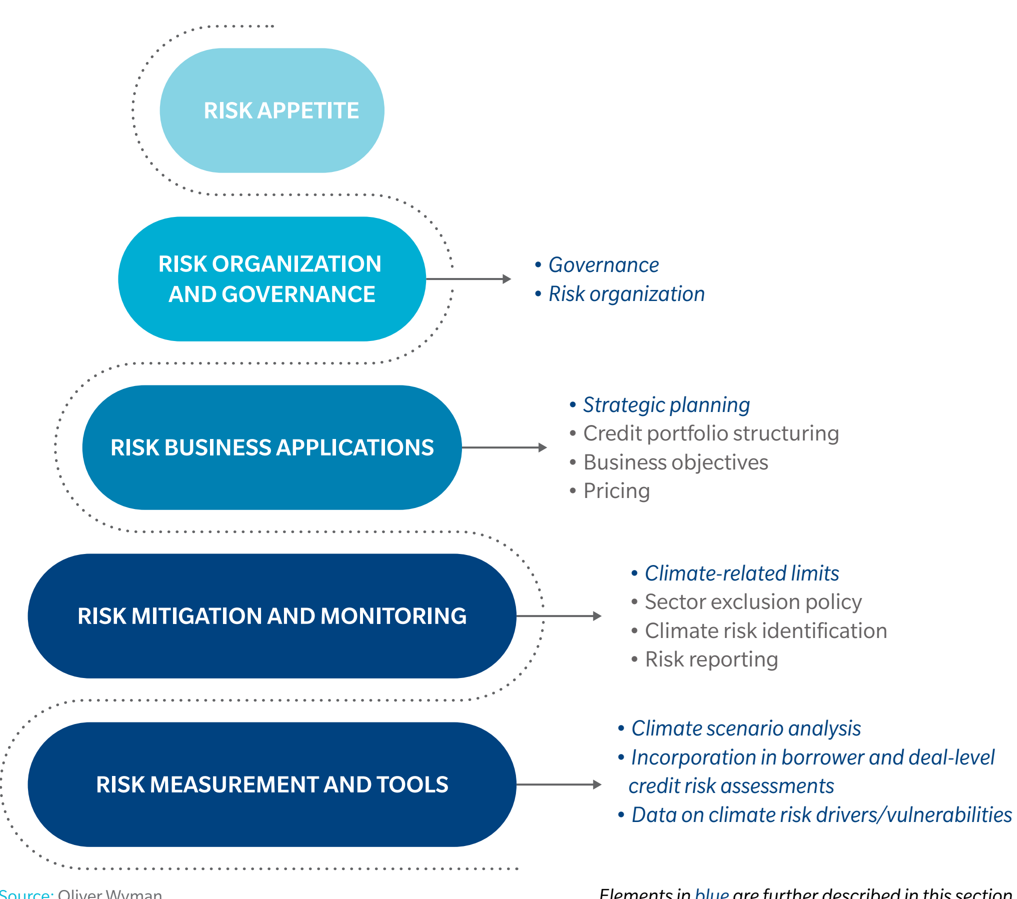
KEY TAKEAWAY 2

BANKS SHOULD INTEGRATE CLIMATE CONSIDERATIONS INTO FINANCIAL RISK MANAGEMENT

The effective management of climate risk requires integration across multiple elements of a firm's risk management framework.

Effective management of climate risk requires integration across multiple elements of a firm's risk management framework (Exhibit 6).

Exhibit 6: Risk management framework and integration of climate considerations



Source: Oliver Wyman

Elements in blue are further described in this section

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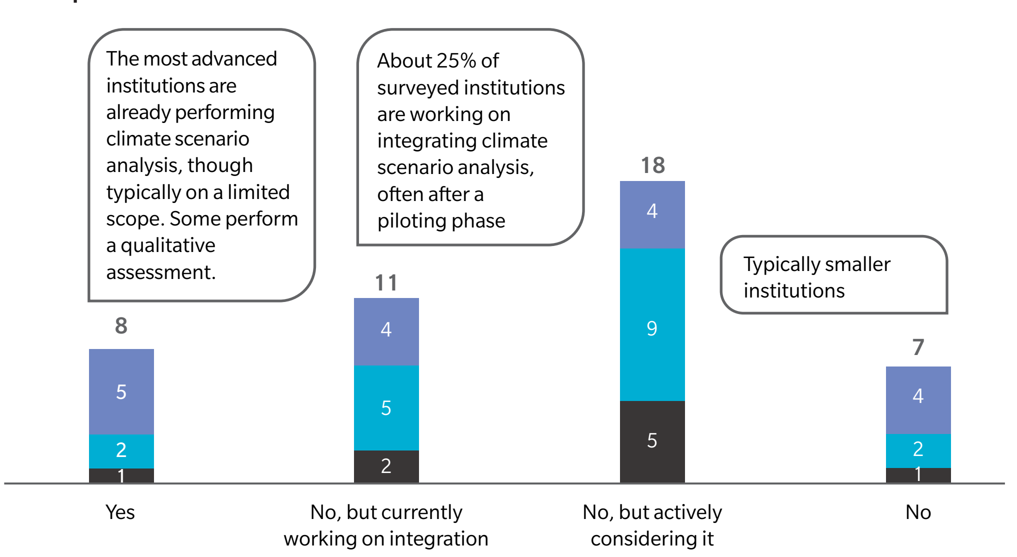
RISK MEASUREMENT AND TOOLS

CLIMATE SCENARIO ANALYSIS

Integrating climate risk into the broader risk management framework requires an institution to understand and measure its potential exposures to climate change. Climate scenario analysis is a useful tool to assess these exposures (Box 3). This tool serves as a "what-if" analysis of one potential state of the world under a specific climate scenario; for example, a scenario under which a low-carbon transition materializes, or not. A scenario is therefore a plausible "hypothetical construct" of the future, not a precise forecast or a predictive model, and thus avoids the often time-consuming distraction of debating the exact likelihood of each scenario. Climate scenario analysis helps to quantify the potential exposures of an institution to transition and physical risks. Many institutions are developing capabilities or plan to do so in the near future, often in response to the TCFD recommendations (Exhibit 7).

Many institutions are developing climate scenario analysis capabilities or plan to do so.

Exhibit 7: Does your institution perform climate scenario analysis and/or climate stress testing?



Source: Oliver Wyman/IACPM Survey (November 2018).

BOX 3

METHODOLOGY TO ASSESS CLIMATE TRANSITION RISK

UNITED NATIONS ENVIRONMENT PROGRAMME – FINANCE INITIATIVE (UNEP FI) PILOT[6]

An example methodology to perform scenario analysis is described below (Exhibit 8). The purpose is to comprehensively assess the impact of the climate transition scenarios on the creditworthiness of wholesale clients. When performing this analysis, we typically develop two modules:

- **A "bottom-up" module**, which assesses the impact of transition risk scenarios on a set of representative exposures, and
- **A "top-down" module**, which extrapolates the name-level information to the remainder of the portfolio

The rationale for developing two modules is to balance accuracy, comprehensiveness, and workload. In practice, only a sample of name-level analyses by sector are necessary to estimate the overall exposure, reducing both the required time and resources, while maintaining integrity and accuracy of the analysis. The bottom-up module is critical to driving a deep understanding of the risks, while the top-down module makes its application across the portfolio far more practical.

Exhibit 8: Overview of Transition Risk Methodology

The top-down module systematically applies the scenario across the portfolio and drives consistency and repeatability

Climate scenarios

Top down module

Evolution of risk factors (by sector/geography)

Emissions cost
Low-carbon capex
Revenue

Climate credit quality index (by sector/geography)

Borrower characteristics (e.g. rating)

Impact on probability of default

Climate scenario models

Bottom up module

Borrower-level analysis

BBB
A-
A
AAA
Time

The impact of the scenario on all borrowers is assessed through a Merton-type model

Bottom-up analysis of select borrowers is used to calibrate the impact of cost and revenue drivers on credit ratings

Input Output

Source: Oliver Wyman

6 For more detail, please refer to "Extending Our Horizons: *Assessing credit risk and opportunity in a changing climate,*" co-published with the United Nations Environment Programme – Finance Initiative, Oliver Wyman, and Mercer.

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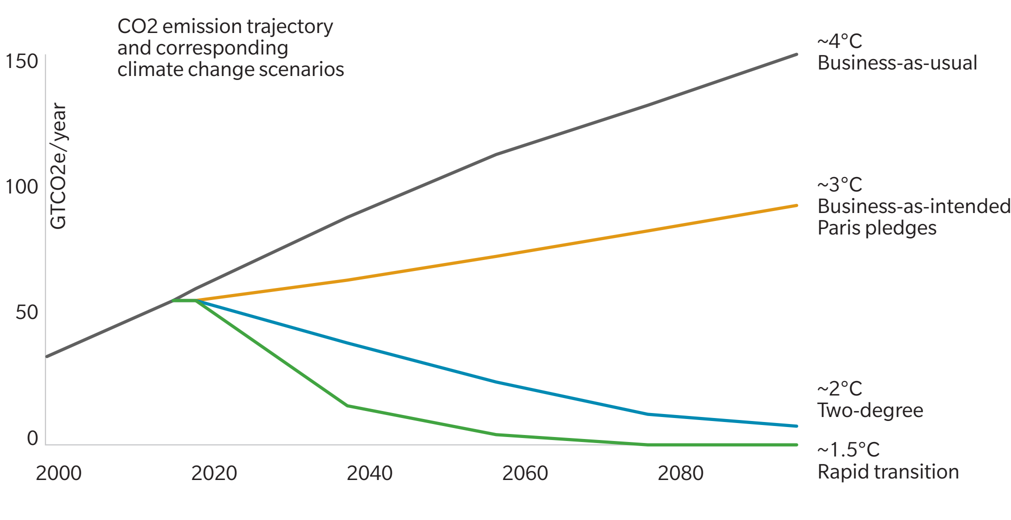
Scenario analysis methodologies need to be compatible with a range of climate scenarios so that banks can test several plausible "hypothetical constructs" of the future, and make strategic decisions based on this analysis. We see two ways of designing climate transition scenarios—temperature-based scenarios and event-based scenarios.

Exhibit 9: Types of climate transition scenarios

Temperature-based scenarios/longer-term



Event-based scenarios/shorter-term (examples)

Triggering event	Type of risk	Key metric	Example exposed sector
Carbon price regulation	Transition (policy)	Carbon price	Oil & Gas/Power generation
Breakthrough in energy storage	Transition (technology)	Battery capacity	Car manufacturers

Source: Oliver Wyman

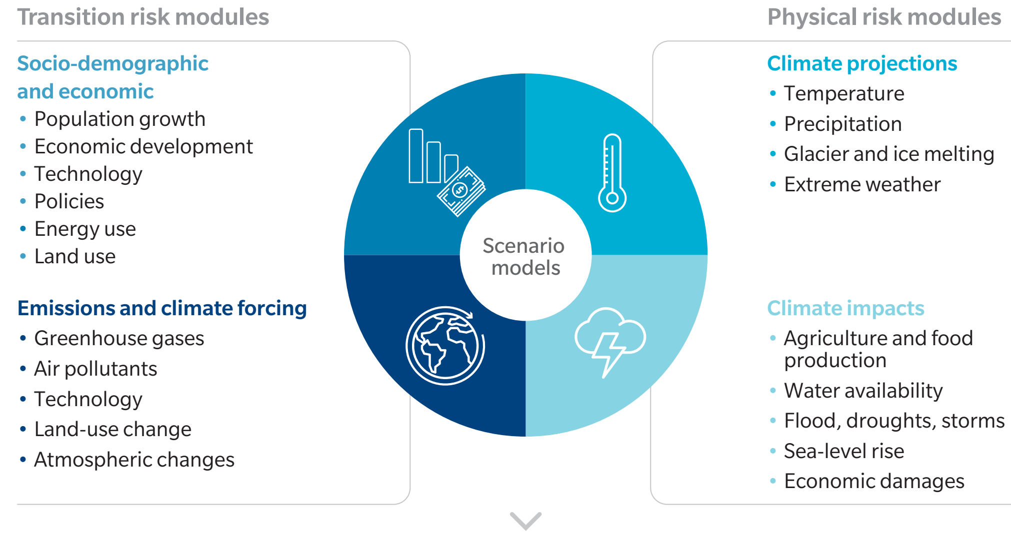
Temperature-based scenarios are holistic scenarios used by researchers, policymakers,and, increasingly, corporations to analyze how the world might achieve a particular change in average global temperature. These scenarios are created by complex models (Exhibit 10) and have been used in studies such as the Intergovernmental Panel on Climate Change (IPCC)[7] assessment reports. They often describe a smooth and orderly transition to a low-carbon economy. Temperature-based scenarios require long-term modeling and assumptions and directly address the recommendations set out by the TCFD with respect to assessing a 2-degree Celsius scenario.[8]

7 The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change (https://www.ipcc.ch/).

8 "The (TCFD) recommends organizations use a 2°Celcius or lower scenario in addition to two or three other scenarios most relevant to their circumstances."

Exhibit 10: Climate scenario models

REPRESENTATIVE MODEL STRUCTURE



Common transition scenario outputs

- Energy demand
- Energy prices
- Land use
- Emissions
- Investments
- Carbon price
- Macroeconomic impacts

Source: Potsdam Institute for Climate Impact Research (PIK)

Event-based scenarios are scenarios focused on the potential short-term impact of one triggering event, such as the sudden implementation of a major carbon price regulation. We can use this type of scenario to model aspects of an abrupt or a disorderly transition to a low-carbon economy.

At this stage, the industry at large is moving towards longer-term, orderly transition scenarios (Exhibit 11). However, from risk and stress testing perspectives, we also see value in modeling shorter-term, disorderly transition scenarios as they may tie to near-term decisions and highlight different risks.

Abrupt or disorderly transition scenarios are not as well understood, but may surface additional risks for institutions as, by definition, an abrupt or a disorderly transition would be less optimal for the economy. These types of scenarios are therefore useful candidates for climate stress testing. While not explicitly mentioned in the TCFD recommendations, they are highlighted in the PRA's draft supervisory statement: *"The scenario analysis should, where*

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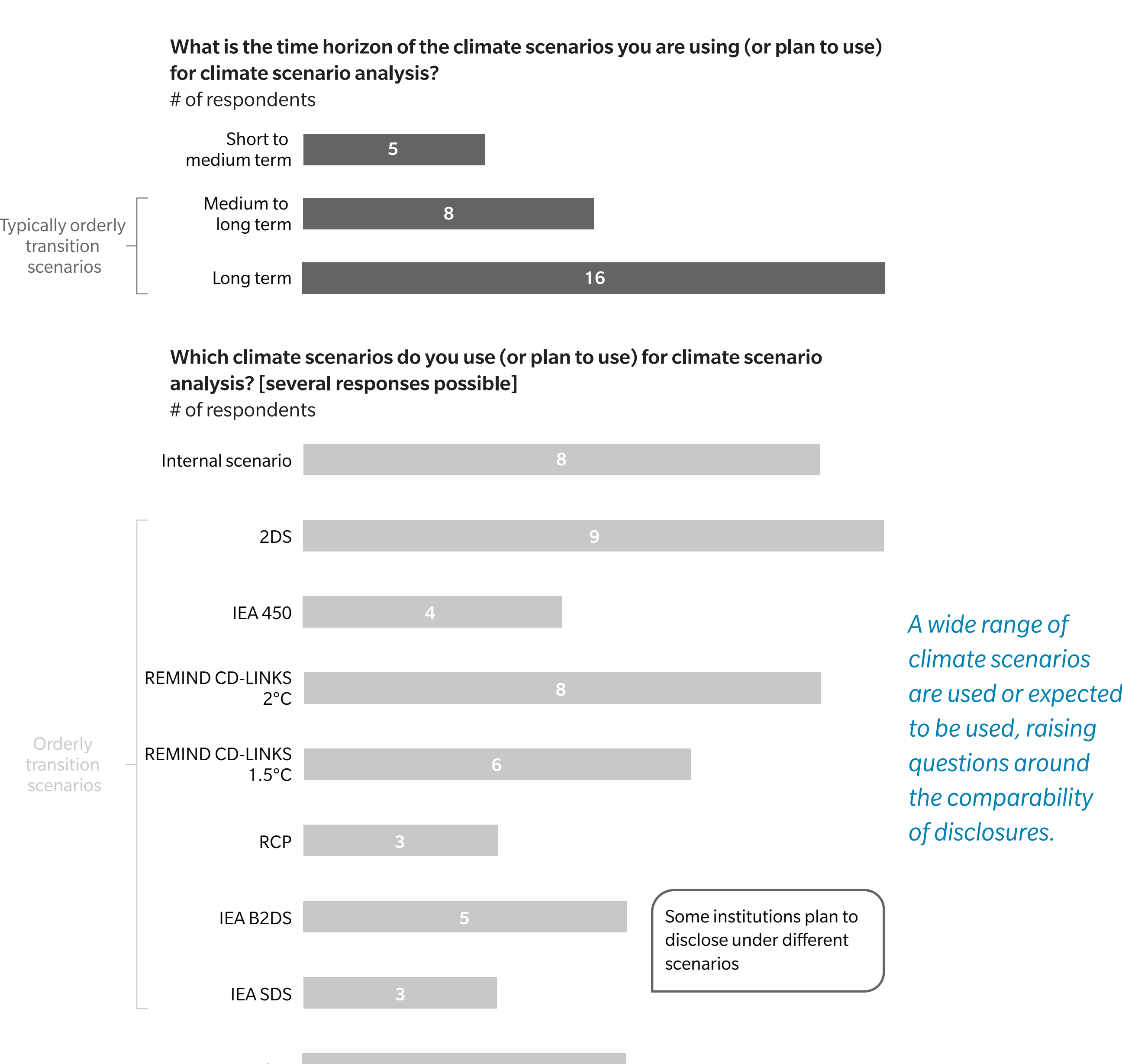
appropriate, include scenarios where the market transition to a low-carbon economy occurs in an orderly manner, or not."[9] While the use of multiple scenarios has benefits with respect to developing a deeper understanding of climate risk, it can make the comparability of climate-related disclosures across institutions challenging.

Exhibit 11: Climate scenarios used in the industry



A wide range of climate scenarios are used or expected to be used, raising questions around the comparability of disclosures.

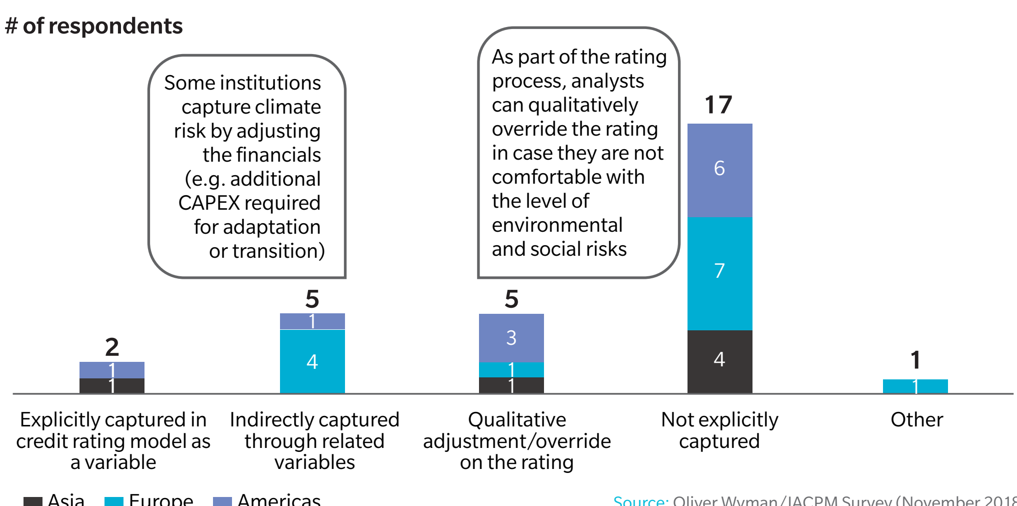
Source: Oliver Wyman/IACPM Survey (November 2018).

9 Prudential Regulation Authority, Consultation Paper, 23/18, *Enhancing banks' and insurers' approaches to managing the financial risks from climate change*, October 2018.

INCORPORATION IN BORROWER AND DEAL-LEVEL CREDIT RISK ASSESSMENTS

Traditional borrower and deal-level financial analysis is another key area for climate risk integration. If emerging risks are identified and quantified, they need to be reflected in the risk ratings of the borrowers. Many institutions have not yet started the journey, while others are looking at ways to capture climate risks within the credit rating process and borrower-level credit assessment processes in an indirect and qualitative manner (Exhibit 12).

Exhibit 12: How are climate risks captured in the credit rating process?



Source: Oliver Wyman/IACPM Survey (November 2018)

In the longer run, banks may want to adjust their business-as-usual rating models to account for climate change. One way to begin the adjustment is to leverage climate scenario analysis. Similar to the analysis performed in the bottom-up module described above, we first assess the impact of the climate scenarios on the financial statements of a set of companies. The scenario-adjusted financials are then translated into a credit rating and finally into a probability of default, using the business-as-usual rating models.

This analysis could be a starting point for considering how climate risks may impact risk ratings. For instance, two companies with the same starting rating could behave very differently in a specific climate scenario, helping to identify the key risk drivers that are potentially missing in the current rating model. These drivers may be candidates for the future generation of risk factors in rating models.

Developing an understanding in this way of the the key climate risk drivers has multiple benefits. Beyond the integration of these drivers into underwriting and credit review processes, understanding climate risk drivers can foster better engagement with banks' customers, helping them manage the transition to a low-carbon future and mitigate their own climate exposures. Thus, understanding climate risks is a way for banks to further position themselves as trusted advisors for their clients, rather than a merely "punitive" exercise.

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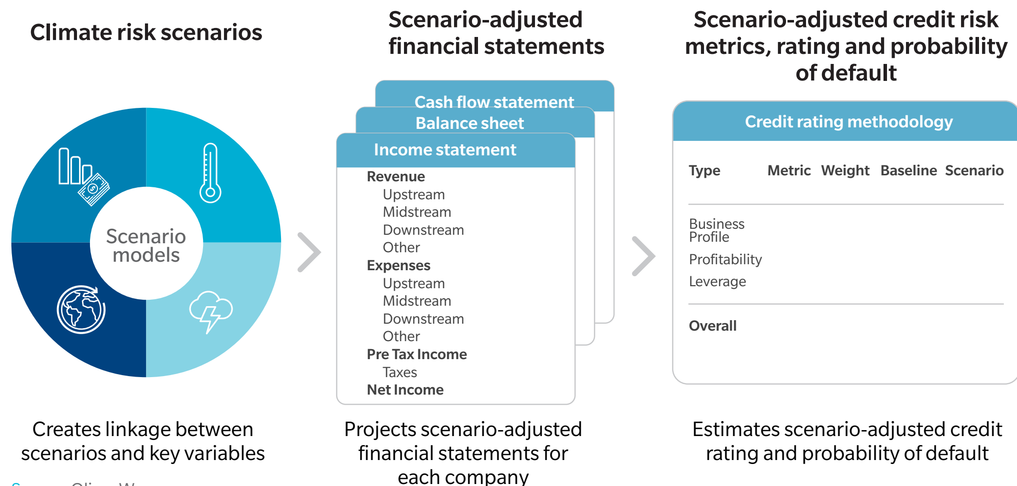
Exhibit 13: Example: Integration of climate risk with traditional financial credit analysis (example)



Source: Oliver Wyman

DATA ON CLIMATE RISK DRIVERS AND VULNERABILITIES

To effectively evaluate climate risks in a lending portfolio, two types of data are required:

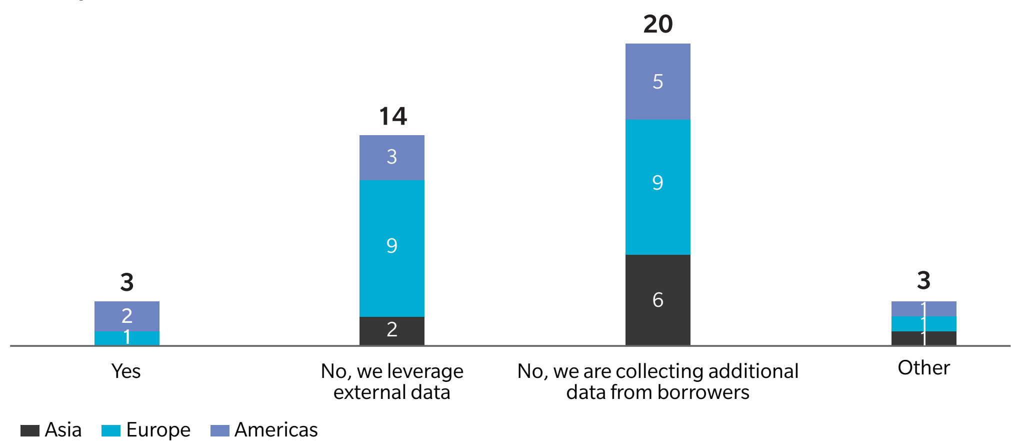
- Climate scenario data describing the general physical, economic, policy, and energy related implications of climate change under a consistent scenario.
- Adequate portfolio data that contain indicators of climate risk vulnerability.

Climate scenarios are essential for understanding and quantifying how the economy could evolve. Models already exist and can be leveraged by banks but are primarily intended for purposes unrelated to financial risk assessment. The most sophisticated scenario models, such as the ones used by the Intergovernmental Panel on Climate Change (IPCC), are intended as energy-economy-climate models with policy and research applications, which leads to two issues. First, from a model risk management perspective, banks need to get comfortable with the modeling assumptions made by scientists in a field they are often unfamiliar with. Second, critical outputs for financial analysis are often unpublished or unavailable, forcing banks to develop their own variables, further interpret some of the results, and pilot the analysis on a sample of their exposures. At Oliver Wyman, we closely follow and participate in the evolution of climate scenario models developed by the scientific community to ensure their utilization will benefit financial institutions and corporates over the coming months and years.[10]

Additionally, borrower's key climate risk drivers are sometimes missing from bank databases (Exhibit 14), complicating the assessment of their climate exposure. Examples include energy mix for utilities, cost of reserves for oil and gas upstream companies, supply chain information for industries, or precise collateral location for mortgages. In these cases, we rely on external borrower-level data, industry-level data, or expert judgment. But more importantly, these analyses help to identify which data items banks should start collecting as part of their underwriting and credit review processes. Leading institutions have already begun the work to adjust their data collection process.

10 Oliver Wyman serves on the finance panel of the SENSES project which aims to develop the new generation of climate change scenarios (http://senses-project.org).

Exhibit 14: Do you have enough internal data to include climate-related issues in the underwriting/rating processes?



Source: Oliver Wyman/IACPM Survey (November 2018)

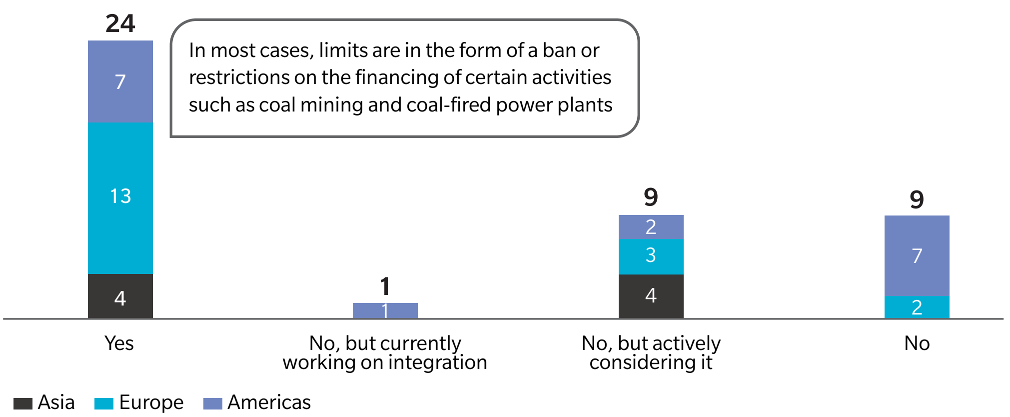
RISK MITIGATION AND MONITORING

CLIMATE-RELATED LIMITS

Many banks are including climate considerations into limits and sector exclusion policy—though these are largely for reputational risk management rather than credit risk management. These limits are often in the form of a ban or restrictions on specific sectors such as coal mining. Evidence of more advanced climate-related limit systems, for example based on total portfolio emissions or climate stressed losses, are limited, which is expected given the novelty of the quantification exercise for these risks.

Exhibit 15: Are climate-related issues explicitly considered when setting and monitoring limits (including exclusion of specific sectors)?

# of respondents



Source: Oliver Wyman/IACPM Survey (November 2018)

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RISK BUSINESS APPLICATIONS (STRATEGIC PLANNING)

As with other risks, once quantified and well understood, the assessment of climate risks can inform key business applications, such as strategic planning. Measurement of risks and expected losses under different climate scenarios will help inform views of potential downsides but must also be complemented with an assessment of revenue-generating opportunities for the bank. For instance, scenario analysis can help banks assess the lending opportunities created by the transition to a low-carbon economy. Bank executives can identify promising lending opportunities by assessing the future potential market and its capabilities.[11]

To assess future potential markets, a bank can identify and evaluate sectors and segments[12] with high investment potential by answering questions around policy impact and technology evolution:

- **Policy impact:** Will future policies have a meaningful impact on the sector's/segment's potential market?
- **Technology evolution and relative performance:** Will the sector's/segment's product be a competitive solution to transition challenges?

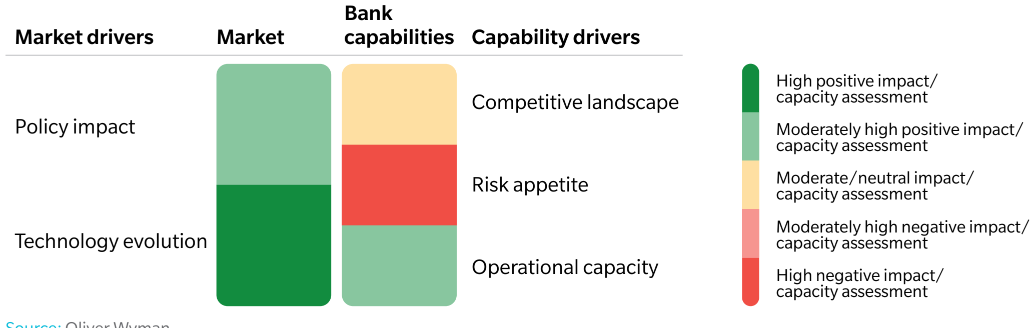
A bank's capabilities to capture opportunities created by the transition to a low-carbon economy may be assessed in a similar manner:

- **Competitive landscape:** Is the bank in a strong position in the sector/segment relative to other players in the market?
- **Risk appetite:** Is the sector's/segment's risk profile aligned with the bank's risk appetite?
- **Operational capacity:** Does the bank have the tools and expertise to act on the sector/segment opportunity?

Once the market opportunity and the bank's capabilities are assessed and compared, they can yield further information about the best ways to move forward (Exhibit 16).

Exhibit 16: Evaluation of climate-related opportunities

Disguised client example: Electric vehicles parts supplier



Source: Oliver Wyman

11 For more detail, please refer to Oliver Wyman's publication *"Extending Our Horizons: Assessing credit risk and opportunity in a changing climate," co-published by the United Nations Environment Programme – Finance Initiative, Oliver Wyman, and Mercer.*

12 Segments provide a more granular view of sectors.

RISK ORGANIZATION AND GOVERNANCE

GOVERNANCE

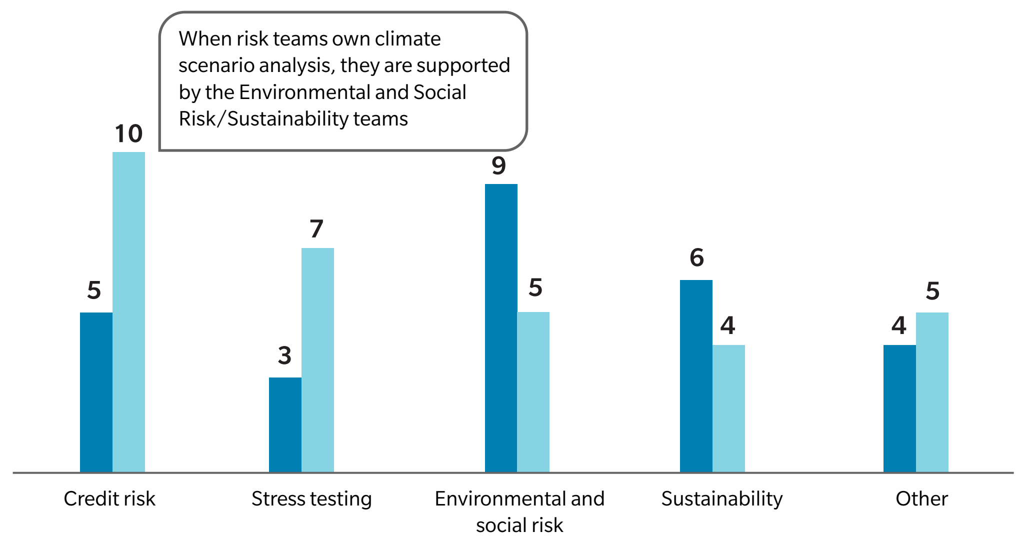
Strong oversight and ownership typically drive the development of sound risk management practices. Recognizing increasing financial stakes and rising external pressures associated with climate change, climate risk should be overseen by the board of directors, as advised in both the TCFD recommendations and the PRA draft supervisory statement (*"PRA considers board-level engagement and accountability important to ensure there is adequate oversight of the firm's business strategy and risk appetite"*).[13] Board-level oversight is intended to ensure the institution takes a long-term, strategic, and firm-wide approach to climate risk.

RISK ORGANIZATION

Currently, initial efforts around the integration of climate considerations are driven by Sustainability and Environmental and Social Risk teams—often focusing on the potential negative impacts of projects and reputational issues. As the scope of climate expands beyond these purely reputational risks and is recognized as a financial risk, the responsibility for managing that risk should also shift. We see eventual responsibility within financial risk management teams. Expanding the responsibility and capabilities from Sustainability and Environmental and Social Risk teams to the financial risk management teams is a key step towards driving effective management of climate risk, as highlighted in our survey results (Exhibit 17).

Exhibit 17: Ownership of climate scenario analysis

Ownership of climate scenario analysis/stress testing



Source: Oliver Wyman/IACPM Survey (November 2018)

13 Prudential Regulation Authority, Consultation Paper, 23/18, *Enhancing banks' and insurers' approaches to managing the financial risks from climate change*, October 2018

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THE PATH FORWARD: ADVANCING YOUR INSTITUTION'S CLIMATE RISK AND TCFD CAPABILITIES

Developing climate risk capabilities and fully implementing the TCFD recommendations are not easy tasks. Given the novelty of the exercise, many institutions follow a fragmented approach, struggling to define a credible and comprehensive workplan to involve the relevant stakeholders and to develop the right tools. Institutions planning to implement the TCFD recommendations need to develop a comprehensive, multi-year program involving stakeholders from the entire organization.

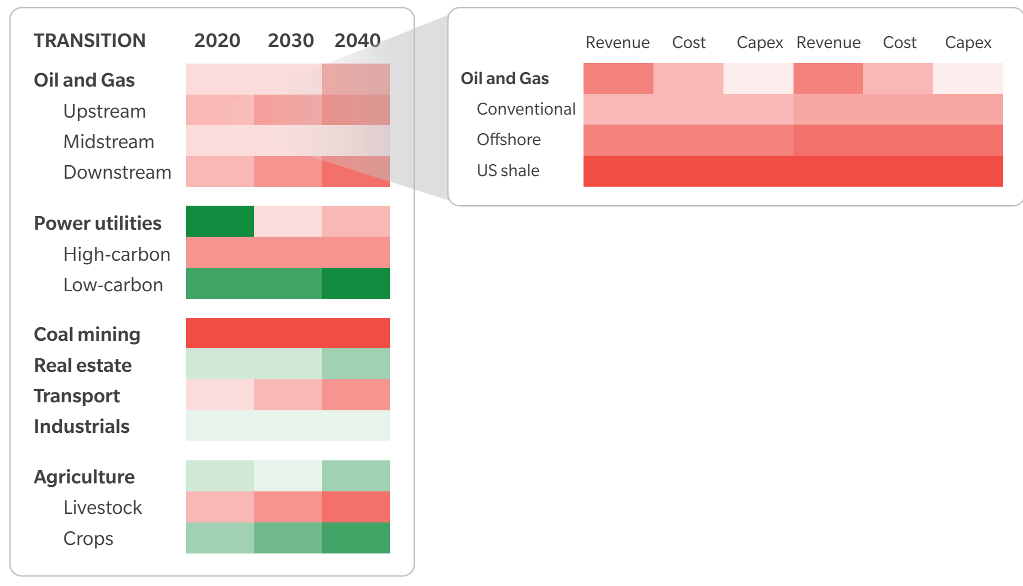
When developing a comprehensive TCFD program for a bank, we recommend the following principles:

- **Initial vision setting:** The board of directors and senior management should decide how ambitious the institution wants to be when building TCFD and climate risk capabilities. For instance, some institutions are already positioning themselves as global leaders on the topic while others may prefer to wait until best practices are established or regulatory and investor pressures increase.
- **Risk-based prioritization:** Resources to develop climate risk capabilities should be allocated to areas with the highest potential impacts. For instance, detailed loan-level scenario analysis may be appropriate for certain high-risk exposures such as power generation, while a high-level review may be sufficient to conclude that some portions of the portfolio are not materially exposed to climate risk.
- **Use of piloting and engagement of experts:** Given the lack of data and the uncertainty around the evolution of climate, integration of cross-functional expertise across the institution and pilot programs are key tools for developing a climate risk framework. Climate scenario analysis, for instance, should be iterative with outputs discussed, challenged, and refined based on the opinions of internal (and potentially external) experts.

Building on these principles, the example below (Exhibit 19) illustrates a high-level, multi-year program institutions can follow to implement the TCFD recommendations, starting with three key foundational steps.

First, the institution **reviews its portfolios and capabilities** to identify high-risk areas of the portfolios and surface potential gaps in capabilities. The portfolio review often takes the form of a high-level heatmap analysis characterizing the potential impact of climate change on the financial statements of the bank (Exhibit 18). Heatmaps can capture differences across geographies and portfolios (e.g. corporate lending vs. mortgages) and are typically calibrated using a combination of qualitative and quantitative information. The portfolio and capabilities review helps prioritize future climate risk and TCFD work.

Exhibit 18: Illustrative output of a portfolio review



Source: Oliver Wyman

Second, based on the high-level assessment of the risks and capability gaps, senior stakeholders reassess the institution's level of ambition and formalize **its vision for climate risk integration.**

Finally, building on the **review and the newly-set vision**, the institution creates a multi-year roadmap to detail the required activities as well as determine the roles and responsibilities to bring the vision to life.

Following these three foundational steps and throughout the development of the framework, banks follow a structured process across different dimensions (such as governance and reporting, risk management, opportunities and business strategy, disclosure and metrics), including:

- Designing the target state for each dimension.
- Piloting the approaches across the dimensions.
- Rolling out the approaches to the entire organization.

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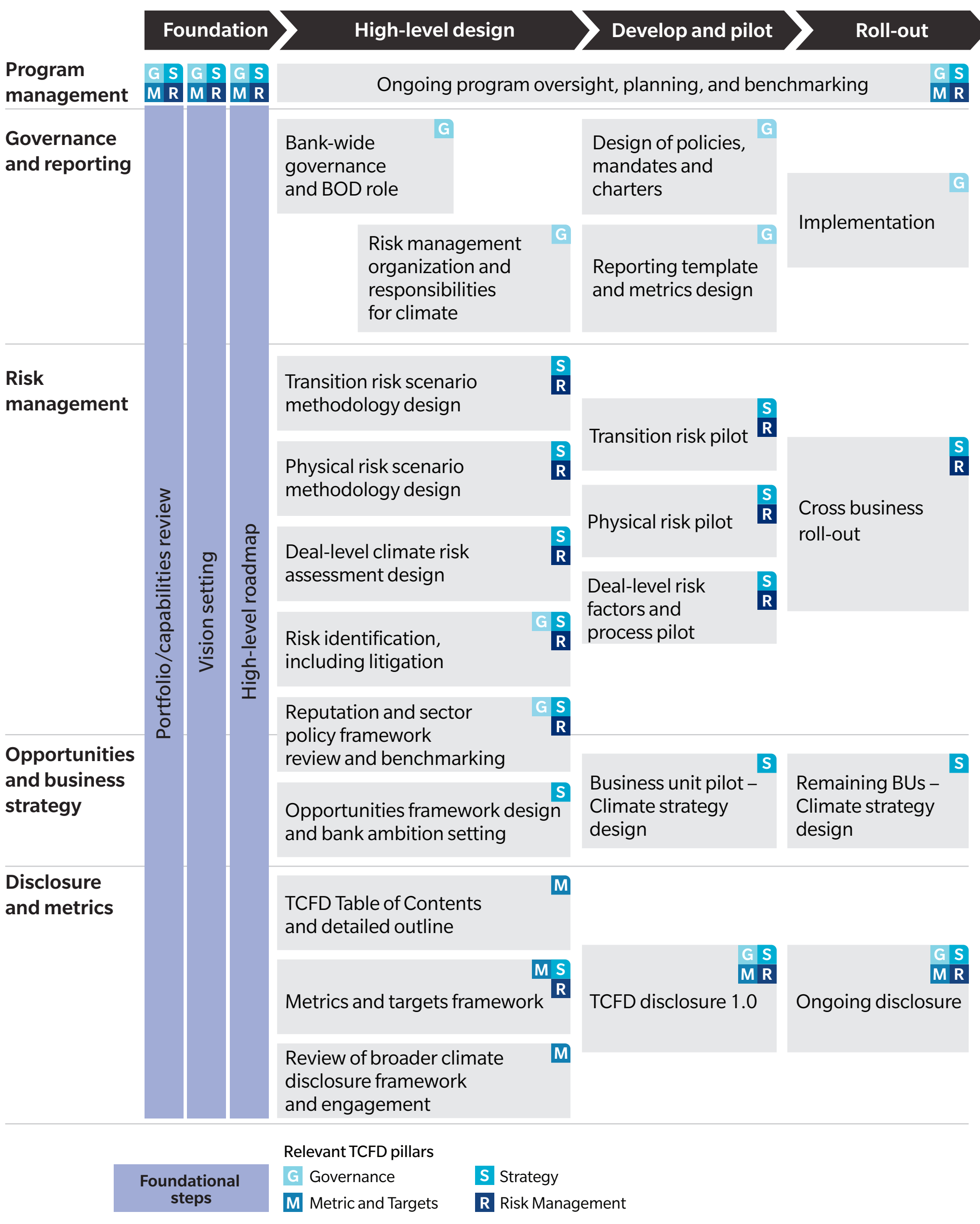
Exhibit 19: Developing a comprehensive, multi-year roadmap



Source: Oliver Wyman

CONCLUSION

The potential disruption and financial implications of climate change are imminent. If PG&E is the "first climate-change bankruptcy," it will certainly not be the last. As the impact of climate change prompts high financial stakes and substantial structural adjustments to the global economy, banks will face both climate risks and opportunities.

In this context, banks need to manage climate risks as a financial risk, not just a reputational one, and integrate climate considerations into their financial risk management frameworks. The management of climate risk is a new exercise and will continue to evolve. Our paper aims to help your institution move in the right direction.

In helping banks assess climate risk, we count on the compounding effect of these efforts. As the financial services industry adopts sound, analytical approaches for understanding climate risk, we believe it will become a significant governance and risk management topic. Investors will respond in kind, as the information created by climate disclosures drives their own capital allocations. A richer data environment can fuel more efficient capital markets. Through all these changes, increasing awareness of climate risk within the financial services industry will ultimately generate broad-based benefits for other industries and society as a whole.

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About the IACPM

The IACPM is an industry association established to further the practice of credit exposure management by providing an active forum for its member institutions to exchange ideas and take collective action. Credit portfolio managers have a unique and evolving role in today's financial markets, and the IACPM offers an excellent forum through which these issues can be identified, understood and addressed. The Association represents its members before legislative and administrative bodies in the US and internationally, holds annual conferences and regional meetings, conducts research on the credit portfolio management field, and works with other organizations on issues of mutual interest relating to the measurement and management of portfolio risk.

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