Monograph on Climate Risk and Green Finance- Banking Sector-International Practices and Indian Perspective

(2nd Series)

ICMAI
THE INSTITUTE OF COST ACCOUNTANTS OF INDIA
भारतीय लागत लेखाकार संस्थान
Statutory Body under an Act of Parliament
(Under the jurisdiction of Ministry of Corporate Affairs)

Banking, Financial Services and Insurance Board
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Behind every successful business decision, there is always a CMA

Vision Statement

˝The Institute of Cost Accountants of India would be the preferred source of resources and professionals for the financial leadership of enterprises globally.˝

Mission Statement

˝The CMA Professionals would ethically drive enterprises globally by creating value to stakeholders in the socio-economic context through competencies drawn from the integration of strategy, management and accounting.˝

About the Institute

The Institute of Cost Accountants of India is a statutory body set up under an Act of Parliament in the year 1959. The Institute as a part of its obligation, regulates the profession of Cost and Management Accountancy, enrols students for its courses, provides coaching facilities to the students, organises professional development programmes for the members and undertakes research programmes in the field of Cost and Management Accountancy. The Institute pursues the vision of cost competitiveness, cost management, efficient use of resources and structured approach to cost accounting as the key drivers of the profession. In today's world, the profession of conventional accounting and auditing has taken a back seat and cost and management accountants are increasingly contributing toward the management of scarce resources and apply strategic decisions. This has opened up further scope and tremendous opportunities for cost accountants in India and abroad.

After an amendment passed by Parliament of India, the Institute is now renamed as ˝The Institute of Cost Accountants of India" from "The Institute of Cost and Works Accountants of India". This step is aimed towards synergising with the global management accounting bodies, sharing the best practices which will be useful to large number of trans¬national Indian companies operating from India and abroad to remain competitive. With the current emphasis on management of resources, the specialized knowledge of evaluating operating efficiency and strategic management the professionals are known as ˝Cost and Management Accountants (CMAs)". The Institute is the largest Cost & Management Accounting body in the world, having approximately 5,00,000 students and 1,00,000 members all over the globe. The Institution headquartered at New Delhi operates through four regional councils at Kolkata, Delhi, Mumbai and Chennai and 112 Chapters situated at important cities in the country as well as 11 Overseas Centres. It is under the administrative control of Ministry of Corporate Affairs, Government of India.

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Published by:

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THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

2nd Series: January, 2026

Price: ₹ 500/-

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PRESIDENT, ICMAI MESSAGE

It gives great satisfaction to share the publication of the *Monograph on Climate Risk and Green Finance — Banking Sector: International Practices and Indian Perspective*, brought out by the **Banking, Financial Services and Insurance (BFSI) Board** of the Institute. This comprehensive handbook marks a significant milestone in our continuous efforts to deepen understanding of the concept of *Net Zero* and the pivotal role of **Cost and Management Accountants (CMAs)** in reviewing financing mechanisms, ensuring due diligence and supporting projects aligned with national sustainability goals.

The objective of this monograph is to: provide clarity on compliance and certification standards related to *Net Zero Emissions Audit*, outline the role of CMAs in facilitating green financing and environmental risk assessments, enable practitioners to adopt effective audit procedures through a detailed checklist for evaluation, mitigation, and viability assessment of projects, the regulatory framework and the ESG Reporting process.

Key highlights of the monograph include **Comprehensive Risk Analysis** for green financing projects, **due diligence scoring mechanism** to assess sustainability measures and practical insights on green loans, environmental compliance, and project viability.

Appreciation is gratefully recorded for the leadership and commitment of CMA Chittaranjan Chattopadhyay, Chairman, BFSI Board, ICMAI, in steering this initiative. Acknowledgment is also due to all Members of the BFSI Board for their continued support, and to the BFSI Department for their dedicated efforts in bringing this publication to fruition.

Members of the Institute are encouraged to engage deeply with its contents and apply the learnings across professional and organizational domains,

thereby advancing transparency, strengthening climate-finance practices, and contributing to the nation's journey toward achieving *Net Zero by 2070* while expanding opportunities for CMA professionals within the climate finance taxonomy and green financing ecosystem.

Let us seize this opportunity to shape a sustainable future and reinforce the values that define our profession.

Jai Hind!

CMA TCA Srinivasa Prasad
President
The Institute of Cost Accountants of India

VICE PRESIDENT, ICMAI MESSAGE

I extend my heartfelt congratulations to CMA Chittaranjan Chattopadhyay, Chairman, and all members of the BFSI Board, ICMAI for the timely and highly relevant release of the *"Monograph on Climate Risk and Green Finance-Banking Sector-International Practices and Indian Perspective."*

The urgency of this initiative cannot be overstated. With rising pollution, global warming, and the recent heatwaves across the country and the world claiming numerous lives, it is evident that environmental sustainability is no longer optional—it is imperative. The Government of India's commitment to achieving Net Zero Carbon Emissions by 2070 sets a clear direction, and as professionals, we must act proactively and decisively to contribute to this national goal.

This publication empowers Cost and Management Accountants (CMAs) to play a pivotal role in auditing environmental sustainability measures, green financing and climate risk mechanism and ensuring that financing flows to industries and projects aligned with green objectives. Such informed financing will not only safeguard our environment but also accelerate progress toward our collective sustainability targets.

Importantly, this is not merely a compliance exercise—it is the need of the hour. Protecting the planet while enabling profitability ensures a secure and thriving future for generations to come. This aligns deeply with the age-old Indian philosophy of ***"Vasudhaiva Kutumbakam"***—the world is one family—reminding us to live harmoniously with nature and preserve its virtues for the days ahead.

The financial sector plays a pivotal role in enabling the global transition to net zero. By leveraging its core functions—capital allocation, intermediation, risk

management, underwriting, investment management and stewardship, market creation, and advisory services—the sector can accelerate the shift toward a low-carbon economy.

According to McKinsey research, private financial institutions alone could contribute approximately 40% of the $9.2 trillion per year required between now and 2050 to achieve an economy-wide transition to net zero. This underscores the critical importance of aligning financial flows with sustainability goals, fostering innovation in green financing instruments, and enhancing risk assessment frameworks to support environmentally responsible investments.

By embracing this responsibility, financial institutions can not only safeguard long-term economic stability but also play a transformative role in building a resilient, sustainable future for the planet.

I also wish to express my sincere gratitude to the leadership, members, and partners who have tirelessly supported our journey to embed sustainability at the core of our profession. Together, let us continue to drive meaningful change for a better, greener, and more sustainable future.

CMA Neeraj D. Joshi
Vice President
The Institute of Cost Accountants of India

MESSAGE FROM THE CHAIRMAN, BFSIB

Respected Members, Colleagues and Readers,

It is my privilege to introduce the second series of this monograph, which presents a focused, practice-oriented examination of climate risk and green finance as they pertain to the banking sector. Climate change is no longer a distant contingency: it is a present, material driver of credit, market, operational and reputational risk. At the same time, financing the transition to a low-carbon economy presents an equally significant opportunity for banks to re-orient portfolios, create new products, and support sustainable growth across industry and infrastructure. This volume seeks to bridge international best practice with the Indian regulatory and market context, offering actionable insight for practitioners and policy-makers alike.

The monograph highlights three interlinked imperatives. First, prudent identification and measurement of climate risk — physical and transition — must become an integral component of risk management frameworks. Second, green finance must be mainstreamed through credible taxonomies, robust disclosure, and verifiable impact metrics so that capital flows to genuinely sustainable activities. Third, institutions must embed these imperatives in governance, strategy, and operational preparedness rather than treating them as periodic compliance tasks.

This edition collates international frameworks, supervisory expectations and model approaches that have gained traction globally, and translates them for Indian banks. It examines scenario analysis and stress testing techniques, climate-adjusted credit assessment, asset-level data requirements, and disclosure practices that enhance transparency for stakeholders. At the same time, it recognises domestic realities — market structures, data limitations and

phased regulatory timetables — and proposes pragmatic roadmaps for staged implementation.

The strategic role of finance professionals — and of Cost and Management Accountants in particular — is emphasised throughout. CMAs can add significant value in areas such as integration of climate variables into costing and credit evaluation, validation of green project economics, development of internal control frameworks for sustainability reporting, and execution of capacity-building programmes at branch and corporate levels. Our profession must therefore equip itself with interdisciplinary skills that span risk modelling, sustainability metrics and regulatory compliance.

The BFSI Board has advanced this agenda through a mix of outreach, publications and training. Practical toolkits, sectoral case studies and capacity-building modules have been disseminated to help banks operationalise climate risk assessments and develop bankable green products. The response from practitioners and regulators has been encouraging, demonstrating the value of applied, practitioner-focused guidance.

This monograph is intended as a concise operational companion. Its value lies in bringing systematic analysis, pragmatic checklists and illustrative examples together so that senior management, risk and credit functions, auditors and regulators have a common reference. It is my hope that readers will use these insights to accelerate the integration of sustainability into mainstream banking decisions, thereby contributing to resilient finance and to India's broader development objectives.

I also commend the author, **CMA Siddhartha Pal,** *Sustainability Consultant*, and the esteemed reviewers — **Dr. Emandi Sankara Rao**, IIT - Bombay a Ph. D in Project Finance & Management of Asset Network and IIT-Kharagpur - M. Tech in Systems Reliability, Risk and Quality Engg. & Management, *Chairman and Director, Vizag Profiles Pvt. Ltd.*; and **Shri Thiruvengadam Parthasarathi**, *Senior Director (Retd.), Deloitte India* — for their valuable insights and rigorous review. I am confident this publication will enhance institutional readiness, strengthen governance standards, and empower CMA professionals to play a leadership role in advancing a sustainable financial system.

With sincere regards,

CMA Chittaranjan Chattopadhyay
Chairman, BFSIB

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What is Sustainability?
"The ability to meet the needs of the present generation while protecting the ability of future generations to meet their own needs".
The core aims of sustainability are to...
Restore damaged areas of the natural environment.
Maintain a balance between human development and the natural environment.
Reuse and recycle goods.
Promote the local economy by crafting/growing products in the areas that they are going to be sold.
Reduce our carbon footprint via alternative energies.
Promote a strong sense of community and a healthy social environment.
Maintain economic capital (wealth and assets, usually in the form of money)


SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

Five Pillars of Sustainability and Linking with UN SDG 17 Goals

Global sustainability agenda for the year 2030 is based on 5 pillars (5Ps), on which the transition to global development through sustainability is based on:**People**, **Prosperity**, **Peace**, **Partnership** and **Planet**

Source as detailed on page nos. 178 & 179

People:

- Financial aid
- Financial development
- Financial empowerment

- Sustainable food production
- Sustainable agriculture
- Land right

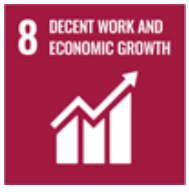
- Reproductive health-care services
- Affordable essential medicines
- Communicable diseases

- Affordable education
- Learning
- Educational financial aid

- Reproductive rights
- Female empowerment
- Gender diversity

Prosperity:

- Awareness of Renewable energy benefits
- Sustainable energy
- Clean energy technology
- Renewable energy



- Economic development
- Trade support for developing countries
- Awareness
- Minimum wage

- Infrastructural development
- Research and development
- Sustainable industrialization

- Equal opportunity
- Economic marginalization
- North-south divide

- Sustainable and Green building
- Smart city
- Citizen participation

Peace:

- Global governance
- Arbitrary detention
- Ethic

Partnership:

- Sustainable development measurement
- Equitable trading system
- Global macroeconomic stability

Planet:

- Water recycling and reuse technologies
- Water pollution
- Watershed management
- Sustainable water management

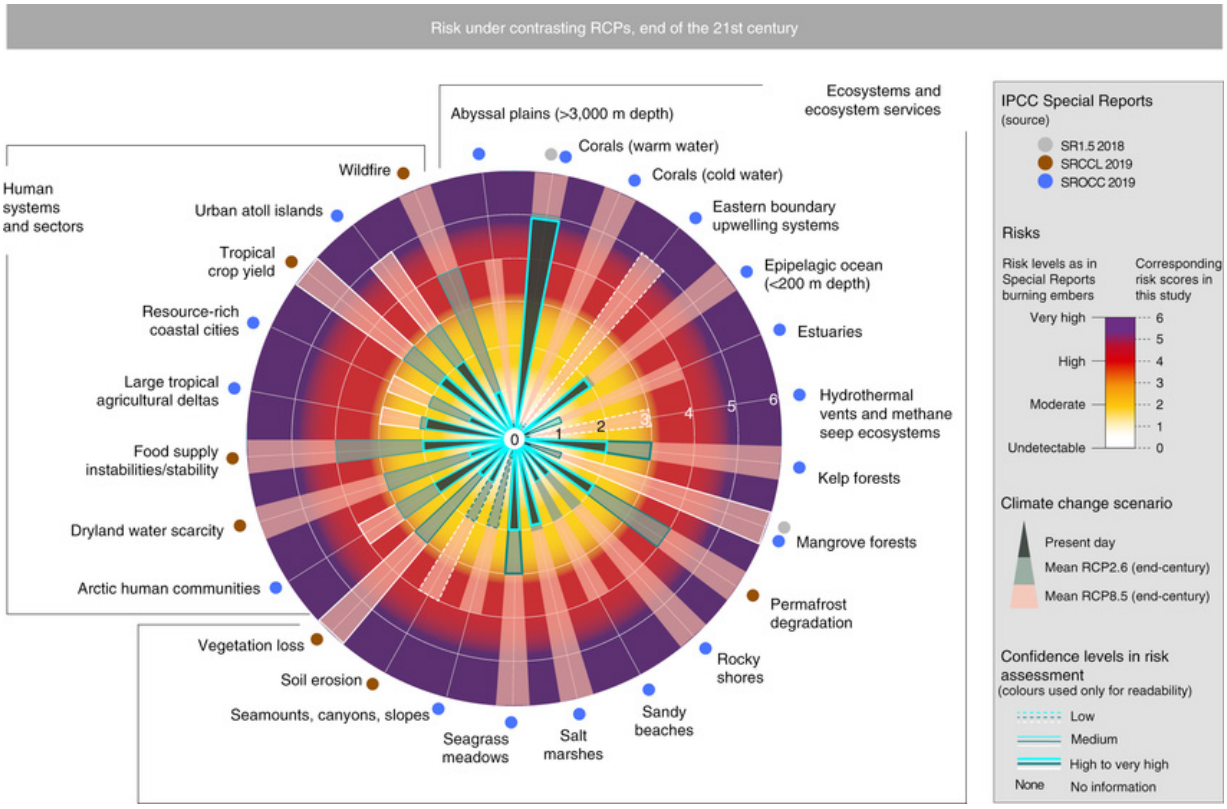
- Sustainable public procurement & Waste management practices
- Sustainability label
- Circular economy

- Environmental education
- Research &Development
- Climate-related hazards
- Warming

- Terrestrial ecosystem
- Strive
- Biodiversity

- Marine pollution
- Marine biodiversity
- Ocean conservation

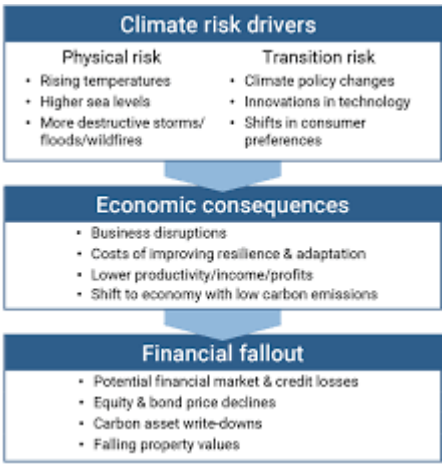
Global Environmental Risk under contrasting scenarios by the end of the 21st century



Source as detailed on page nos. 178 & 179

The climate-modelling community has developed four Representative Concentration Pathways (RCPs). The four RCPs span a large range of future global warming scenarios. RCPs are space and time and dependent trajectories of future greenhouse gas concentrations and different pollutants caused by different human activities.

Climate Risk



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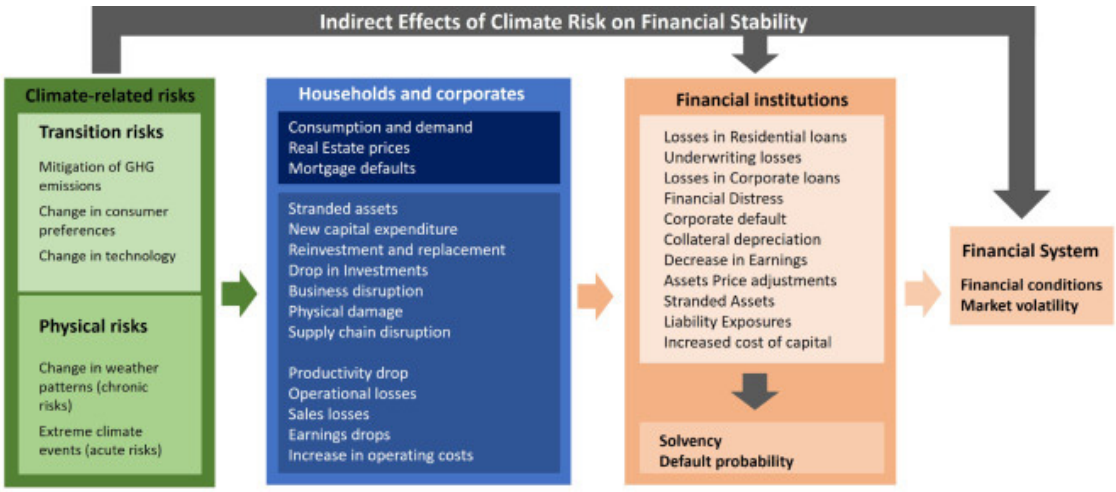

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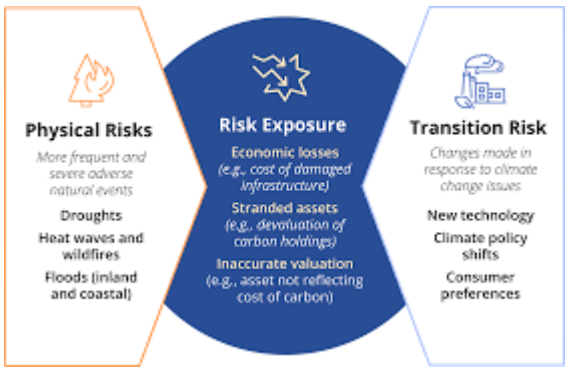

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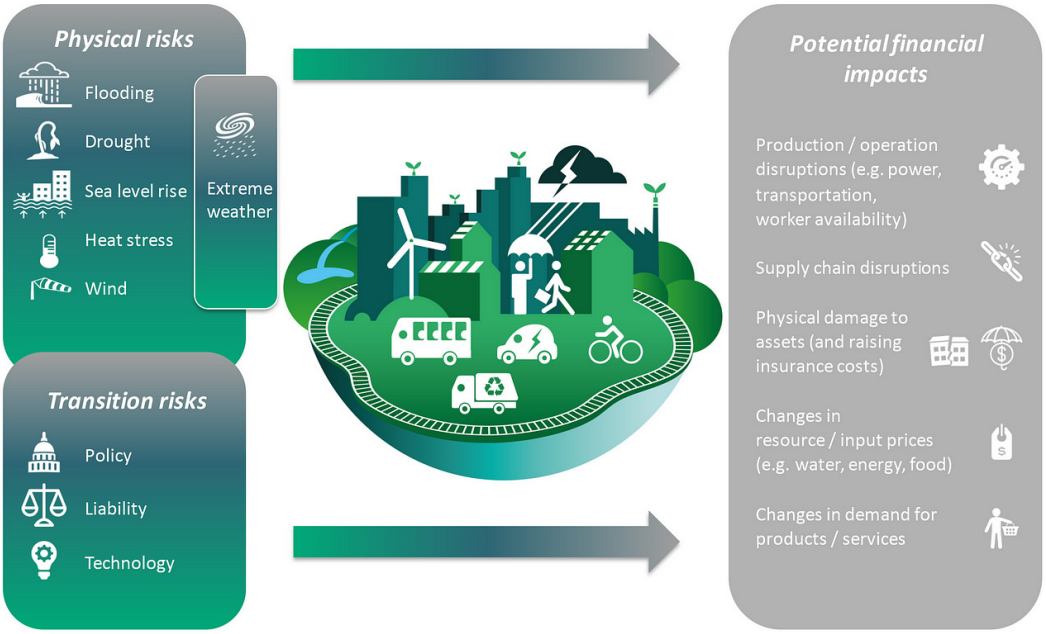

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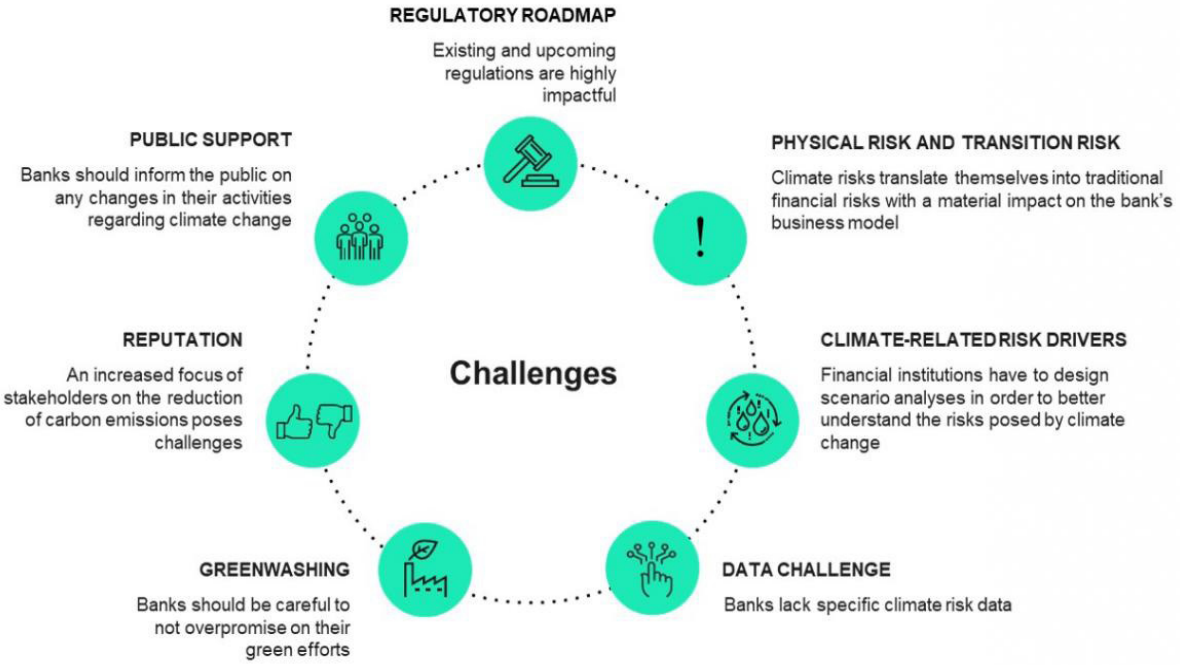

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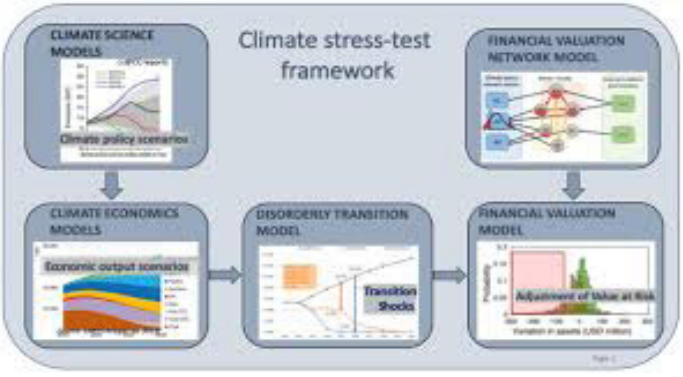

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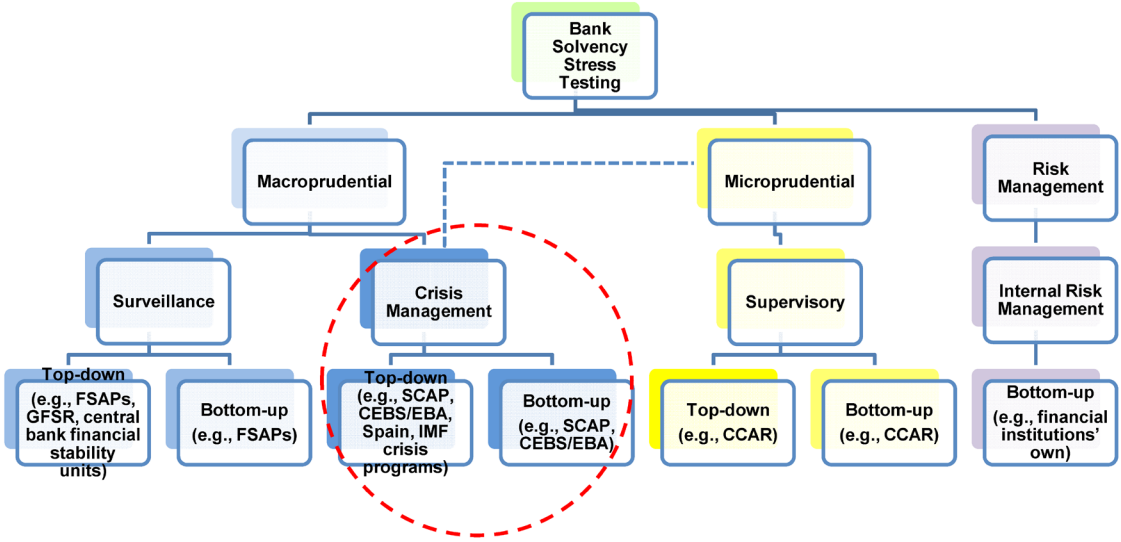

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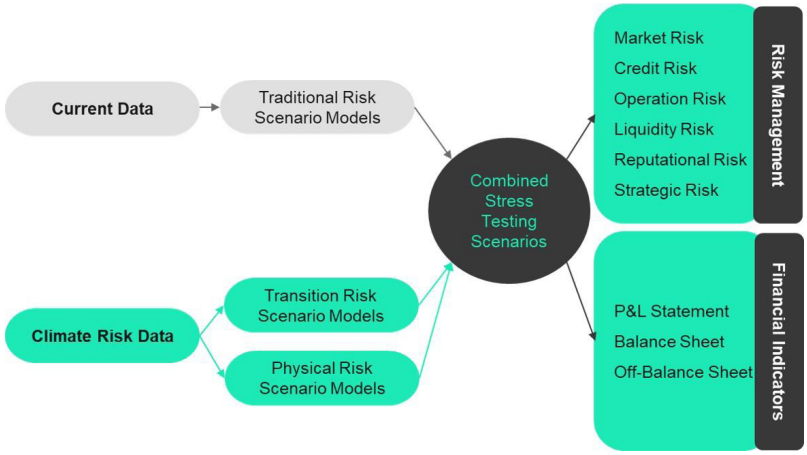


Climate change as Physical Risk for BFSI sector

Climate change poses significant physical risks to the BFSI (Banking, Financial Services, and Insurance) sector, impacting its operations, assets, and overall stability. These risks stem from extreme weather events and long-term climate shifts, affecting both direct and indirect operations of financial institutions.

Direct Impacts:

- **Damage to Assets and Infrastructure:** Extreme weather events like floods, hurricanes, and wildfires can damage Banks, Financial Services and Insurance (BFSI) organisations, data centres, and other critical infrastructure, leading to operational disruptions and financial losses.
- **Increased Credit Defaults:** Climate-related disasters can negatively impact borrowers' ability to repay loans, leading to increased credit defaults and losses for banks.
- **Property Value Declines:** Physical risks like sea-level rise and extreme heat can reduce property values in affected areas, impacting the value of collateral held by banks.

Indirect Impacts:

- **Disruptions to Supply Chains:** Climate-related disruptions to agricultural production, manufacturing, and other industries can disrupt supply chains, affect businesses and increase the risk of loan defaults.
- **Impact on Insurance Claims:** Increased frequency and severity of extreme weather events can lead to a surge in insurance claims, impacting the financial health of insurance companies and potentially affecting their ability to pay out claims.
- **Economic Downturns:** Climate change impacts on agriculture, tourism, and other sectors can trigger broader economic downturns, affecting the overall financial stability of the region.
- **Liquidity Risks:** Climate-related disasters can strain bank liquidity as customers may need to draw on credit lines or withdraw deposits to finance recovery efforts.
- **Systemic Risk:** The interconnectedness of the financial system means that physical risks to one institution or sector can quickly spread to others, potentially leading to systemic instability.

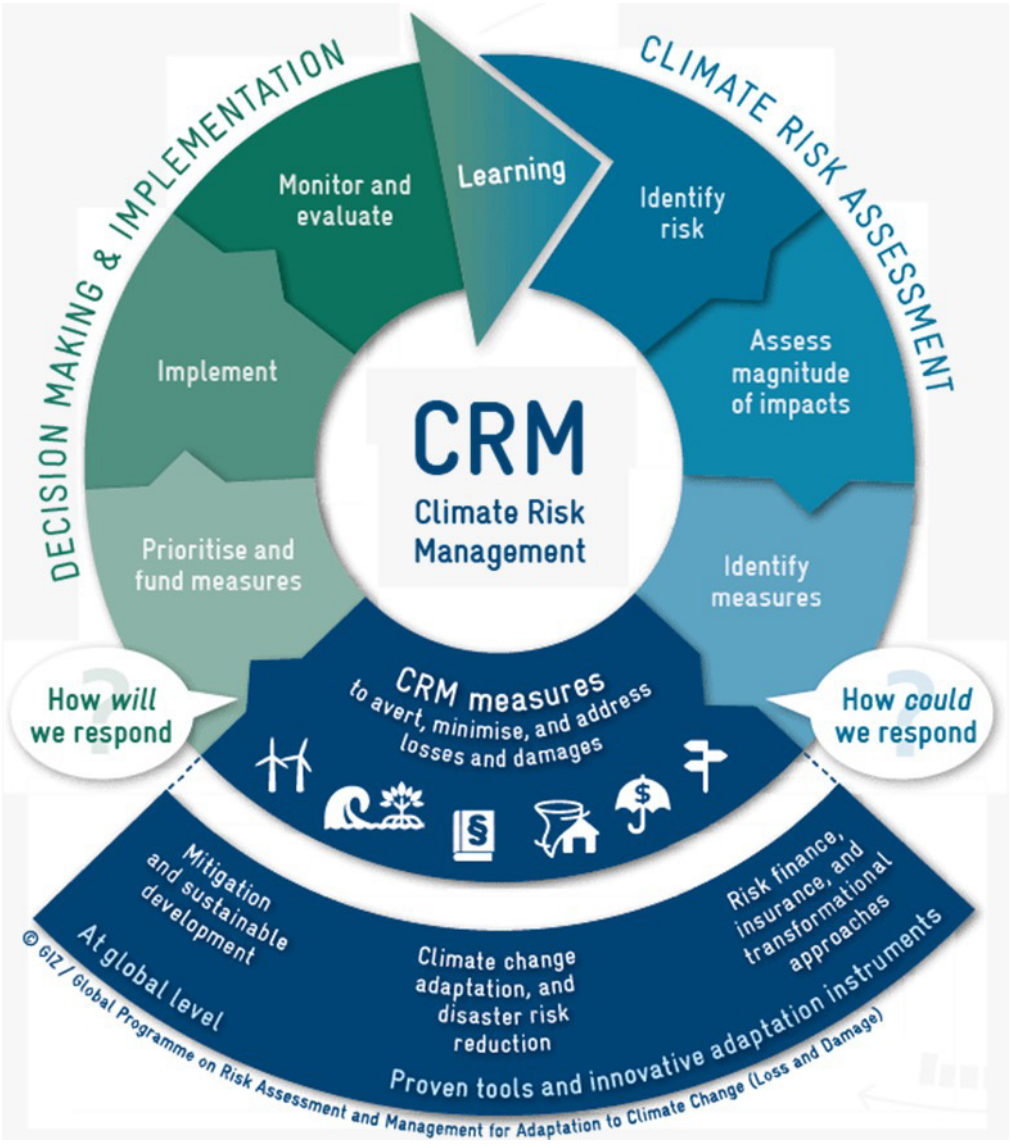
Addressing Physical Climate Risks for BFSI sector:

- **Risk Assessment:** Banks, Financial Services and Insurance (BFSI) organisations need to assess their exposure to physical climate risks, including geographic locations, sectors, and individual assets.
- **Risk Management:** BFSI sector need to develop strategies to manage and mitigate physical climate risks, such as diversifying loan portfolios, strengthening infrastructure, and investing in climate-resilient technologies.
- **Scenario Analysis:** Banks, Financial Services and Insurance (BFSI) sector should conduct scenario analysis to understand the potential impacts of different climate change scenarios on their operations and financial performance.
- **Climate-Resilient Infrastructure:** Investing in climate-resilient infrastructure, both for their own operations and for the sectors they finance, can help reduce vulnerability to physical climate risks.

By proactively addressing physical climate risks, the BFSI sector can enhance its resilience, protect its assets, and contribute to a more sustainable and stable financial system.

Climate Risk Assessment Framework

A climate risk assessment framework is a structured approach to identifying, analysing, and managing the potential impacts of climate change on an organization or system. It helps in understanding how climate-related hazards, like extreme weather events, can affect an organization's operations, assets, and overall resilience. This framework typically involves assessing climate-related hazards, exposure, and vulnerability, ultimately leading to risk management strategies.



Source as detailed on page nos. 178 & 179

Here's a more detailed breakdown:

A. Establishing the Context:

- This step defines the scope of the assessment, including the geographic area, time horizon, and specific assets or operations being evaluated.
- It also involves identifying relevant climate-related hazards, such as rising temperatures, sea-level rise, increased frequency of extreme weather events, and changes in precipitation patterns.

B. Identifying and Analysing Climate Risks:

- **Hazard Identification and Assessment:** This involves understanding the potential impacts of climate change on the system, including the intensity, frequency, and duration of hazards.
- **Exposure Analysis:** This step assesses who or what is exposed to these hazards, including people, infrastructure, and natural resources.
- **Vulnerability Assessment:** This step evaluates the susceptibility of the exposed elements to the impacts of climate change, considering factors like social, economic, and environmental conditions.

C. Developing and Implementing Risk Management Strategies:

- **Risk Prioritization:** Based on the risk assessment, the framework helps prioritize risks based on their potential impact and likelihood.
- **Mitigation and Adaptation Strategies:** This involves developing and implementing measures to reduce the likelihood and/or impact of climate-related risks. Mitigation strategies focus on reducing greenhouse gas emissions, while adaptation strategies focus on adjusting to the impacts of climate change.
- **Monitoring and Evaluation:** The framework includes ongoing monitoring of climate risks and the effectiveness of implemented strategies.

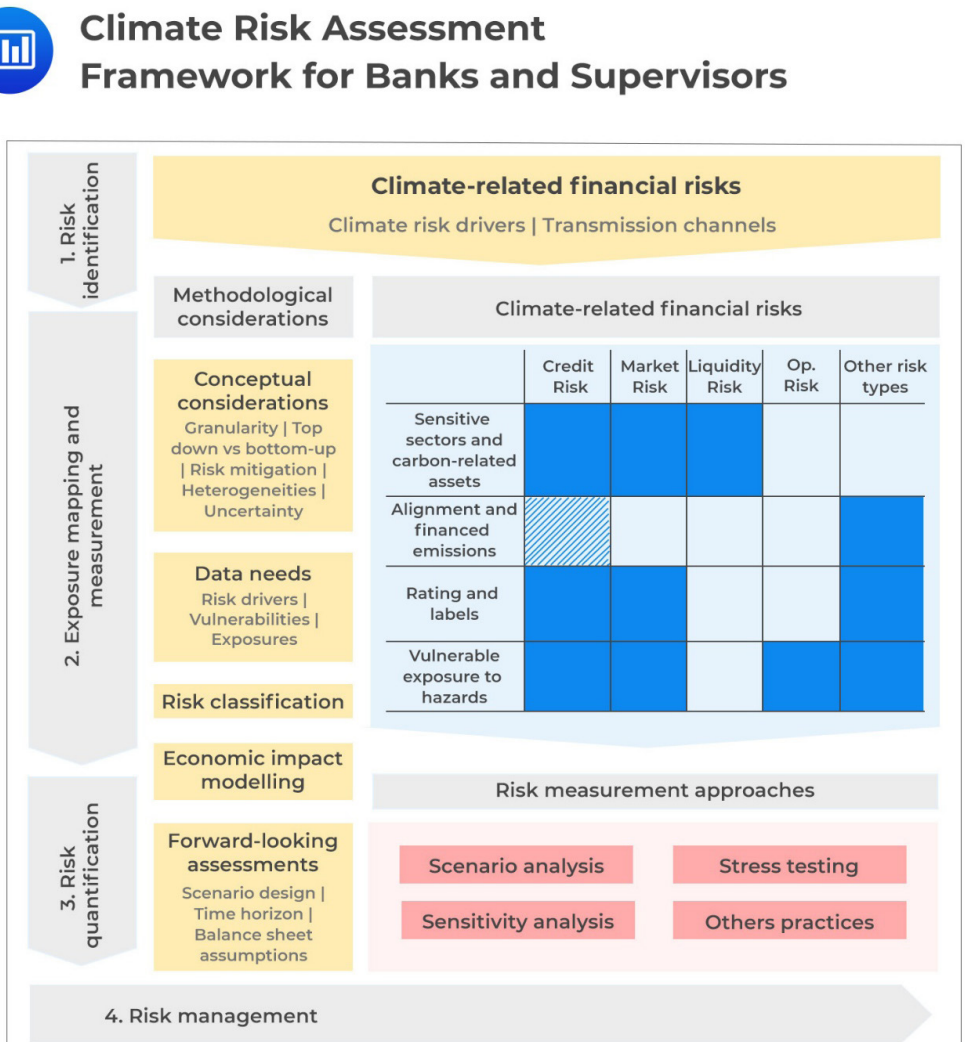
Key Components of a Climate Risk Assessment Framework:

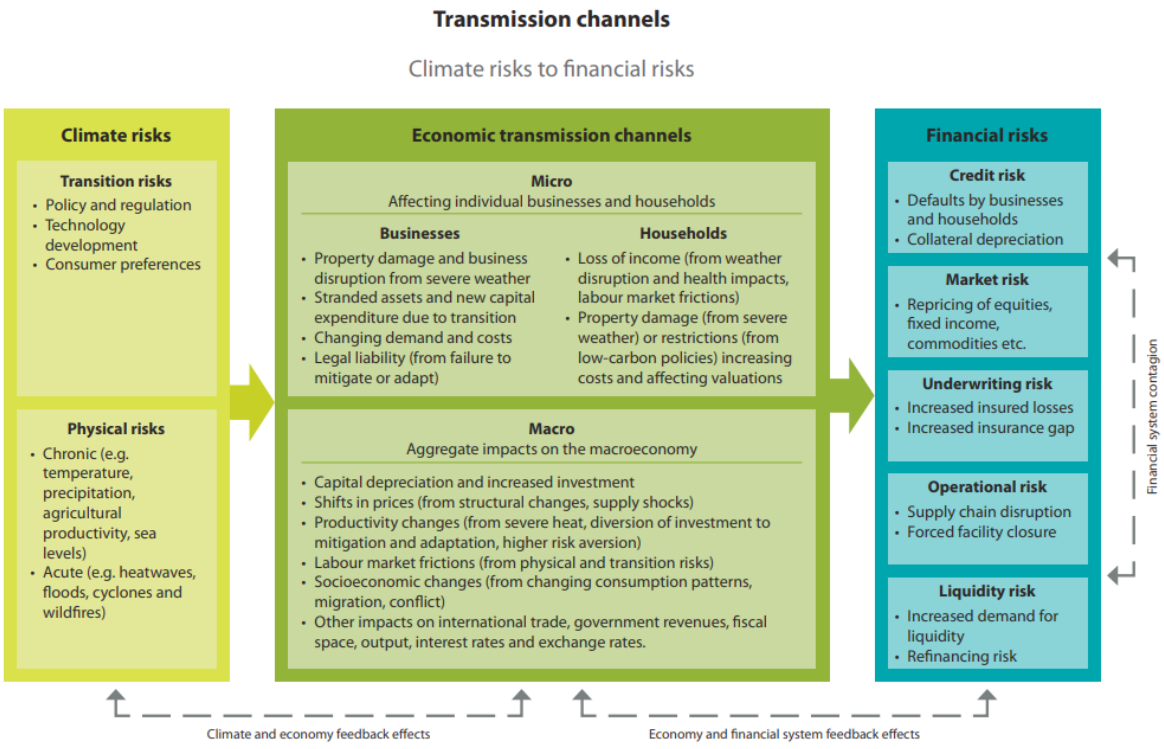
- **Hazard Identification:** Identifying potential climate-related hazards (e.g., floods, droughts, heat waves).
- **Exposure Assessment:** Determining who or what is exposed to these hazards.
- **Vulnerability Assessment:** Evaluating the susceptibility of exposed elements to the hazards.
- **Risk Analysis:** Combining hazard, exposure, and vulnerability information to assess the overall risk.

- **Risk Management:** Developing and implementing strategies to reduce or manage climate risks.
- **Monitoring and Evaluation:** Tracking the effectiveness of implemented strategies.

Examples of Climate Risk Assessment Frameworks:

- **CLIMAAX:** A framework designed for regional climate risk assessments in Europe, focusing on harmonizing approaches and supporting adaptation strategies.
- **Climate Risk Integration Framework (BSR):** A framework that guides companies in integrating climate risk into existing risk management systems.
- **Climate Risk and Vulnerability Assessment Tool:** A tool developed by the NDC Partnership for assessing climate risk and vulnerability of communities and infrastructure.





Climate risk refers to the potential negative effects of climate change on various aspects of the environment, businesses and society.Rising global temperatures, attributed to increased greenhouse gas emissions from human activity, might result in changes in the global climate system. This, in turn, impacts the Earth's weather and natural ecosystems, and the ways in which human being lives and works. As the world works to better understand the impacts of climate change, experts and policymakers are taking steps to understand and measure climate riskand find ways to mitigate it. Climate risk is having the potential negative impacts of climate change on the environment, society, and economy. It includes two types of risks:

Physical Risks - These are the physical impacts of climate change, such as:

- Extreme weather events
- Sea-level rise
- Changes in temperature and precipitation patterns

Transition Risks - These are the risks related to the transition to a lower-carbon economy, i.e.

- Policy, legal, technological, and market changes
- The process of adjusting to a low-carbon economy

Climate risk is assessed by analysing the likelihoods, consequences, and responses to these impacts. Societal constraints can also shape adaptation options.

Some examples of how climate risk can manifest include:

- Businesses that rely heavily on fossil fuels may face financial losses
- Communities may face socio-economic disruption
- Flooding can affect the value of property assets, leading to increased credit risks for banks

Understanding climate change's material impacts will help banks strengthen their resilience and drive strategic growth. Connecting data on physical and transition risks with planning and decision-making tools is key to unlocking new opportunities while managing downside.

Climate-related financial risks have the potential to affect the safety and soundness of banks through physical and transition risks, which affect various sectors of the economy and may affect access to financial services and fair treatment of customers.

Understanding climate risk is important for many reasons. The consequences of climate change can increase social inequalities and harm public health. The World Health Organization estimates that between 2030 and 2050, climate change might cause millions of additional deaths from malnutrition, disease and heat stress. In addition, extreme weather events can lead to loss of life, displacement of people and increased poverty.

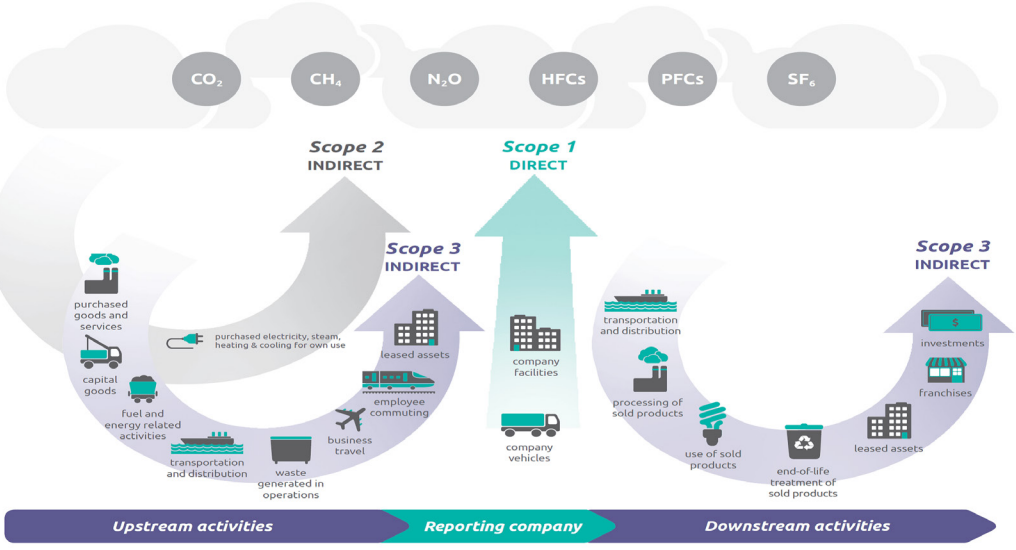
Net Zero

Source as detailed on page nos. 178 & 179

- Net zero is defined as a state in which any greenhouse gasses (GHGs) released into the atmosphere and caused by human activities are compensated for by equal amounts of GHGs removed (IPCC, 2023). Put simply, net zero means cutting carbon emissions to a small number of residual emissions that can be absorbed and durably stored by nature and other carbon dioxide removal measures, leaving zero in the atmosphere.
- **Greenhouse Gasses (GHGs)** - Greenhouse Gases scope can be described as "levels" of emissions, with some occurring under the entity's direct control and others occurring within the supply chain or elsewhere outside of entity's direct control.

- **Scope 1** encompasses direct emissions from owned (or controlled) sources like company vehicles and manufacturing facilities,
- **Scope 2** includes indirect emissions from the generation of purchased electricity, steam, heating, and cooling,
- **Scope 3** is a very broad category that includes all "other" indirect emissions like business travel, investments, end-of-life treatment of sold products, and purchased goods and services (among others)

Many regulatory bodies are mandating that management teams publicly disclose corporate emissions, climate risk impacts, and other material ESG issues. Analysts and management teams at public issuers must know how to account for carbon emissions in order to remain compliant with these emerging regulations and avoid accusations of greenwashing. As a result, the financial services community (institutional asset managers, commercial banks, etc.) must also be able to make sense of these disclosures.



Source as detailed on page nos. 178 & 179

- **Net zero importance** - The science shows clearly that in order to avert the worst impacts of climate change and preserve a liveable planet, global temperature increase needs to be limited to 1.5°C above pre-industrial levels. Currently, the Earth is already about 1.1°C warmer than it was in the late 1800s, and emissions continue to rise. To keep global warming to no more than 1.5°C - as called for in the Paris Agreement - emissions need to be reduced by 45% by 2030 and reach achievable net zero much before the end of this century.
- **Way to achieve net zero** - Transitioning to a net-zero world is one of the greatest challenge humankinds has ever faced. It calls for nothing less than a complete transformation of how we produce, consume, and move about. The energy sector is the source of around three-quarters of greenhouse gas emissions today and holds the key to averting the worst effects of climate change. Replacing polluting coal, gas and oil-fired power with energy from renewable sources, such as wind or solar, would dramatically reduce carbon emissions.
- **Most emissions come from just a few countries** - The top five emitters (China, the United States of America, India, the European Union, the Russian Federation) accounted

for about 60 per cent of greenhouse gas emissions in 2021. The Group of 20 (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, the United States, and the European Union) are responsible for about 76 per cent of global greenhouse gas emissions. (Source: UNEP Emissions Gap Report 2023)

In 2022, the average global temperature increased by about 1.15 degrees Celsius compared to pre-industrial levels. Recent scenario models by the World Meteorological Organization (WMO) show a 66% likelihood of breaching the 1.5-degree Celsius threshold, which is recognized as a key planetary boundary, between 2023 and 2027 for at least one year.

Breaching this threshold risks irreversible changes to the climate (Rockström et al., 2023; World Meteorological Organization, 2023). Increasingly severe wildfire seasons, record-breaking droughts and floods, and rapidly shrinking ice caps are manifestations of a changing climate (Clifford, 2023).

The ripple effects of climate change are becoming increasingly apparent in the global economy. Between 2016 and 2018, climate-related disasters cost the world around $650 billion (Harmstone, 2020). If global average temperatures continued to increase to 3.2 degrees Celsius by 2050, a realistic estimate under current policies according to the IPCC, global GDP could shrink by 18% (Marchant, 2021; IPCC, 2023).

Achieving Net Zero:

Lead The Way	Transform Decisions	Measure what Matters	Access Finance
Identifying the risks and opportunities of pursuing a net zero strategy	Developing a net zero pathway to bridge the emissions gap	Measuring and tracking performance	Engaging with investors on net zero
Developing the finance culture to support the transition	Integrating net zero targets into strategic planning and budgeting	Embedding into business valuations	Reporting and disclosing GHG emissions
Engaging the board and executive management	Developing integrated management information		Managing external reporting and disclosure
Incentivizing action along the value chain			

What does it mean to be Net Zero

Failure to act on climate change represents an existential risk to society and the global economy. As per the World Economic Forum's report, Climate Action Failure in the top two risks by likelihood and by impact over the next 10 years, with extreme weather the top risk by likelihood. The Paris Agreement, adopted by world leaders in 2015, aims to keep global heating to well below 2°C above pre-industrial levels by 2100 and to strive for a maximum 1.5°C rise in global average temperatures.

According to the climate scientists, to avoid the worst effects of climate change, any rise needs to be limited to 1.5°C. The urgency is clear: to limit global warming to these levels, global greenhouse gas (GHG) emissions need to halve by 2030, reach net zero around mid-century and be negative during the second half of the century. The scale and speed of the transition needed is unprecedented and will require rapid and far-reaching transitions across the whole economy. Further, even if temperature increases are limited to 1.5°C, significant investment to adapt to the physical impacts of climate change will be needed.

Net zero will be achieved when global emissions of GHGs to the atmosphere are balanced with removals of GHGs from the atmosphere. Key components to achieve this include the deep decarbonization of the economy in energy, urban, infrastructure, industrial and land use systems as well as permanently removing the residual GHG emissions that are unfeasible to reduce or avoid. As global awareness of the need to reach net zero GHG emissions ('net zero emissions') has grown, so has the need for a common understanding on what net zero emissions means and how to achieve net zero goals. Investors are also putting pressure on companies to lay out their plans for reaching net zero emissions and to demonstrate how net zero pathways are integrated into their long-term strategy.

The whole financial system, including the banking sector, has a crucial role to play in reaching global net zero emissions. Banks represent a large proportion of the world's available capital and are in an influential position, through their lending and financing activities, to support the transition to a net zero economy. By supporting their clients' transition activities and by directing capital away from carbon intensive activities and towards technologies, companies and projects that are aligned with a net zero emissions economy, banks can have a real impact on a global trajectory to limit global warming to no more than 1.5°C.

Banks Leadership team can support the efforts and plans of their organizations to progress towards net zero emissions by: sourcing, analysing and providing the information needed to drive decisions, developing and setting interim targets, measuring, monitoring and reporting progress over time and incentivizing action within the bank.

Pursuing Net Zero Strategy - Identifying Risks and Opportunities

Risk and opportunity, specifically relating to macro trends associated with environmental and social issues.

TRANSITION RISKS AND PHYSICAL RISKS

- **Transition risks** arise from the global shift towards a net zero economy. This may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change. Depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of financial and reputational risk to organizations.

Examples include:

- Climate-related developments in policy and regulation, such as tightened energy efficiency standards and increased pricing of GHG emissions.
- The emergence of disruptive technology or business models that affect asset values.
- Shifting sentiment and societal preferences, or evolving evidence, frameworks and legal interpretations, which increase exposure to climate-related litigation or higher costs for insurance cover.

- **Physical risks** resulting from climate change can be event driven (acute) or longer-term shifts in climate patterns (chronic). Physical risks may have financial implications for organizations, such as direct damage to assets and indirect impacts from supply chain disruption. Organizations' financial performance may also be affected by changes in water availability, sourcing, and quality; food security; and extreme temperature changes affecting organizations' premises, operations, supply chain, transport needs, and employee safety.

- **OPPORTUNITY**

  Pursuing a net zero strategy can help banks to identify opportunities within their own operations or through supporting the activities being undertaken at a country or regional level. This includes the development of financing products that meet the growing need for public and private investment in technologies, industries and companies to support a net zero transition. The chart below shows some of the ways in which banks can channel capital into a net zero economy through their capital markets activities, lending activities, securitization and/or equity stakes and sponsorship.

Structuring via Capital Markets	Increasing their own lending capacity Bank	Taking Direct Risk exposure with clients	Funding Innovations
Debt structures: • Covered bond • Senior unsecured • Hybrid bonds • KPI-linked bonds **Marketing themes of bonds:** • Green, Blue, Transition, Sustainability or Climate Action Investment Funds • Carbon offsetting fund • Structured fund - development finance	**Green securitisation** **Synthetic Risk Transfer** **Green bond issuance**	**Green loans (use of proceeds loans)** • Green mortgages **Green revolving facilities linked to sustainability** • Sustainable-linked loan • ESG-linked loan • Positive incentive loan • Impact loan **Green asset finance** **Green project finance** **Blended finance** • For renewable projects • For energy efficiency **Specific pot for clean growth lending** **Synthetic Power Plant**	**Venture Capital** **Sponsorship** **Crowd funding**

Key Steps to Developing Net Zero Pathway

STEP 1 - SETTING NET ZERO COMMITMENTS

- Helping to identify data sources that may be owned by other functions of the bank, assessing quality of data and conducting analysis for setting commitments.
- Monitoring progress and compliance to commitments made by the bank.

Some examples of the initiatives, frameworks and resources available

- UN-convened Net-Zero Banking Alliance (NZBA) - industry-led collaboration of 45 banks withUSD 29 trillion in assets that have committed to align their lending and investment portfolios withnet-zero emissions by 2050. The NZBA was co-launched with the Financial Services Taskforce (FSTF)of The Prince of Wales's Sustainable Markets Initiative (SMI), and the commitment statement detailswhat the net zero commitment should look like, the guidance to use and how they should meet thiscommitment.
- Collective Commitment to Climate Action (CCCA) - a leadership group under the UNEP FIPrinciples for Responsible Banking. Provides guidelines for climate target setting for banks, whichunderpins the commitment statement of the NZBA.

STEP 2 - MEASUREMENT OF FINANCED EMISSIONS

- Interpreting disclosure requirements, helping to provide portfolio and counterparty information,manipulating data and assessing data quality

Some examples of the initiatives, frameworks and resources available

- Partnership for Carbon Accounting Financials (PCAF) have developed the Global GHG Accounting and Reporting Standard for the Financial Industry.

STEP 3 - SETTING TARGETS

- Helping to identify data sources and assessing quality of data for the analysis of lending and investment portfolios against a chosen target-setting framework, such as SBTi
- Monitoring and tracking progress against these targets set

Some examples of the initiatives, frameworks and resources available

- Science Based Targets for Financial Institutions - provides resources for target setting methods,criteria, a target setting tool, and a guidance document. SBTi has also developed an asset-classspecific approach that so far includes: real estate, mortgages, electricity generation project finance,and corporate and consumer loans, bonds and equity.

STEP 4 - DEVISING PATHWAYS

- Helping to provide financial information to input into decision making
- Helping to review and revise best practice according to evolving standards, data and regulations

Some examples of the initiatives, frameworks and resources available

❖ The Network for Greening the Financial System (NGFS) climate scenarios have been developed to provide a common starting point for analysing climate risks to the economy and financial system.

❖ Developed primarily for use by central banks and supervisors, they may also be useful to banks and the wider economy. The Net Zero 2050 scenario limits global warming to 1.5°C, reaching net zero by around 2050

STEP 5 - CLIMATE SCENARIO ANALYSIS TOOLS

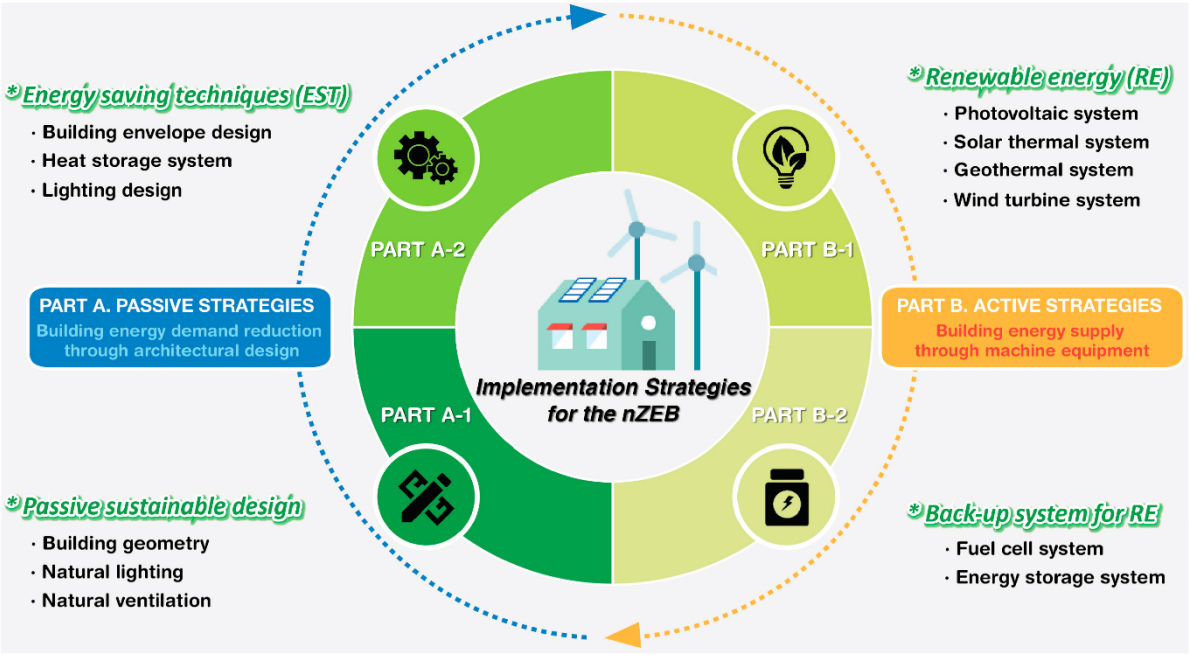
- Identifying and providing relevant data, and developing systems and processes

Some examples of the initiatives, frameworks and resources available

❖ The Paris Agreement Capital Transition Assessment (PACTA) - an open-source climate scenarioanalysis tool developed by the 2° Investing Initiative ("2DII") and backed by the UN Principles forResponsible Investment. The additional PACTA for Banks enables users to measure the alignment oftheir corporate lending portfolios with climate scenarios across key climate-relevant sectors andtechnologies (currently Power, Fossil Fuels, Automotive, Steel and Cement).

Importance of Net Zero for the BFSI Sector

Source: Boston Consulting Group



Source as detailed on page nos. 178 & 179

Climate-related considerations in finance have increased significantly over the past decade, with the number of financial institutions that have set science-based climate targets are increasing steadily (quadrupling in 2023). With the ability to allocate much-needed funds to key technologies, the financial sector plays a critical role in enabling a fast and just transition to net zero. This recognition has led to increased scrutiny from regulatory bodies, investors, and customers.

Transitioning to a state of net-zero emissions would avert the direst consequences of climate change on the economy and planet. However, this transition comes with a price tag: $275 trillion in cumulative spending until 2050, according to McKinsey (2022). The financial industry will play a crucial role in the efficient allocation of these funds required for a successful, global transition to net zero. While economies around the world are already grappling with the impacts of rising temperature levels, the financial industry has not yet embraced its leadership role in the transition as institutions' actions are often at odds with their climate commitments (McCully, 2023).

- **CDP (Carbon Disclosure Project)** runs the world's leading environmental disclosure system for companies, cities, states, and regions. The non-profit works with more than 740 financial institutions with over $130 trillion in assets and provides this data to financial institutions.
- **Bankers for Net Zero (B4NZ)** is the UK Country Chapter of the UN-Convened Net Zero Banking Alliance, one of the four main pillars of the Glasgow Financial Alliance for Net Zero (GFANZ).
- **Nordea** is one of the largest financial institutions in the Nordics and has climate targets of lowering emissions by 40-50% before 2030.
- The Swiss multinational financial services and investment bank UBS is a founding member of the Net Zero Asset Managers initiative and aims to achieve net zero across their scope 1, 2, and 3 activities by 2050.
- The **Glasgow Financial Alliance for Net Zero (GFANZ)** is an alliance made up of over 160 financial institutions representing over $70 trillion in assets under management. The launch of GFANZ is a significant step towards mobilizing private finance for the transition to a net-zero emissions economy, and demonstrates the growing momentum behind efforts to address climate change.
- As allocators and facilitators of capital flows, financial institutions bear a lot of responsibility in ensuring climate financing and investing is effective.Financial sector plays a key role in supporting companies transition to net zero both when it comes to transition financing, in educating, and supporting customers with relevant guidance and tools.

- On **Greenwashing** - There is an increased focus on greenwashing in the market in particular to protect investors, end consumers through improving data accuracy and transparency to mitigate the risk of misrepresenting the performance.
- Bottlenecks Financial Institutions face in their disclosure efforts - Carbon Calculation and Disclosure Challenges; Comprehensive coverage of value chain emissions; Scaling Data collection and Engaging SMEs

Why is achieving Net Zero important for BFSI sector

1) Governments and legislators are moving towards setting legally binding net zero targets. As part of this shift, the regulatory landscape is rapidly evolving with countries introducing green finance strategies and roadmaps that will present unique opportunities for banks.

2) Anticipated policy changes, e.g. reducing emissions from the built environment and encouraging electric vehicle usage, will impact a number of sectors both directly and indirectly. The products and services that banks offer may need to change to support this transition. Changes in national and international policies will be critical in order for banks, and society in general, to meet net zero targets.

3) Investors are increasingly focused on climate-related financial risks and the implications of these for the long-term viability of current business models.

4) Employees, present and future, are increasingly attracted to organizations that can demonstrate their sustainable business credentials and how they are part of the solution to global issues such as climate change.

Customers and consumers are increasingly seeking environmentally and socially acceptable alternatives to traditional banking products and service offerings.

Achieving Net Zero - Current Landscape - BFSI Leading the Transition

For Financial Services Sector, four categories of climate-related disclosure regulations and standards:

1. **Climate Regulations & Legislation** - These are mandatory climate-related disclosure requirements, often applying to a well-defined group of organizations operating within a given jurisdiction.
    - **Corporate Sustainability Reporting Directive (CSRD - EU)** - Requires comprehensive climate-related disclosures by large EU financial services institutions and non-EU listed companies,
    - **European Sustainability Reporting Standards (ESRS - EU)** - Outline reporting requirements under the CSRD; Adopted by the European Commission in July 2023,
    - **Sustainable Finance Disclosure Regulation (SFDR - EU)** -Mandates EU financial market participants and financial advisors to disclose their value chain emissions (since 2023) to improve the visibility of sustainability risks in the financial sector,
    - **Streamlined Energy and Carbon Reporting (SECR - UK)** -Requires large UK companies to report on their energy use and carbon emissions (scopes 1 and 2),
    - **Sustainability Disclosure Requirements (SDR - UK)** - Overarching sustainability framework for the UK,
    - **Sustainability Disclosure Standards (SDS - UK)** - Prescribe corporate disclosure requirements on sustainability-related risks and opportunities,
2. **Voluntary Disclosure Frameworks** - These are mostly voluntary standards and guidelines for how corporate carbon disclosures should be conducted. Often, these are crafted for a particular industry to account for the differing characteristics and climate risk components of different sectors.
    - **International Sustainability Standards Board (IFRS ISSB)** - Aims to develop a comprehensive global baseline of high-quality sustainability disclosure standards; First two of these - IFRS S1 and S2 - focus on climate-related risks and opportunities, unveiled in 2023.
    - **Task Force on Climate-related Financial Disclosures (TCFD)** - Provides a framework for companies to disclose climate-related risks and opportunities in their financial filings.
    - **Global Reporting Initiative (GRI)** - Provides some of the most widely used sustainability reporting standards globally; GRI already endorsed the IFRS S1 and S2l.

- **Principles for Responsible Investment (PRI)** - United Nations-supported international network of investors working together to implement sustainable investment practices; PRI has mandatory TCFD alignment required for all of their signatories.

3. **Climate Commitments** - There exists a variety of voluntary climate commitments across the globe, which encourage organizations to publicly commit to emission reduction goals.

4. **Carbon Accounting Standards** - In order for organizations to meet regulatory requirements and follow through with their commitments, they need to properly account for their emissions. International accounting standards provide guidance.

5. **Role of BFSI Sector in the context of the Net Zero Transition**

Financial Sector has a key role to play in supporting the net zero transition, through the allocation of capital, intermediation, risk management, underwriting, investment management and stewardship, market creation, and advisory services. McKinsey research suggests that private financial institutions could provide roughly 40% of the $9.2tn per annum of investment needed between now and 2050 to support a global economy-wide transition to net zero.

Financial institutions act as intermediaries, and can support their client and portfolio companies' own decarbonization efforts through the provision of financial products and services. These can include new financial solutions; debt and equity finance; advisory services for clients (e.g., on strategic M&A); institutional investment and stewardship; the provision of insurance and underwriting services, including new types of insurance; and management of household savings and investments for retail clients.

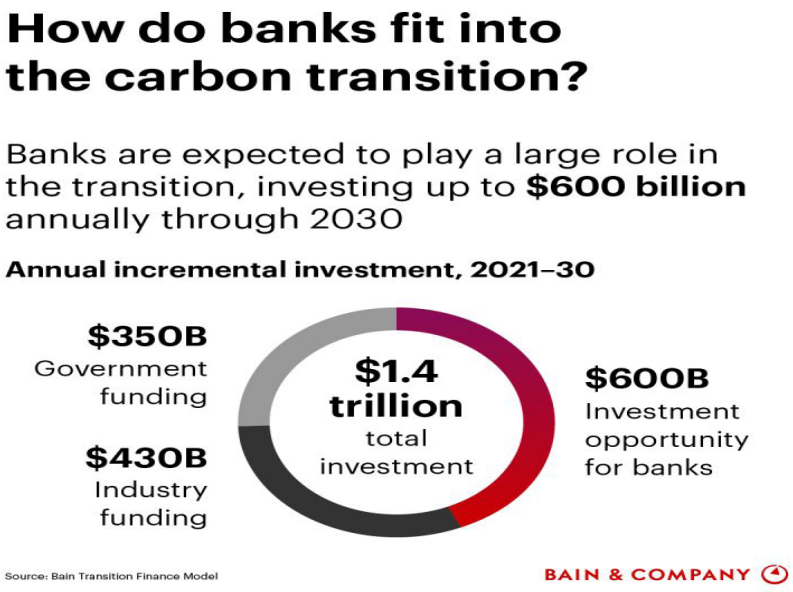
While the financial sector will clearly play a significant role during the transition, it is important to recognize that financial institutions have limited direct influence over the emissions reductions of their clients and investees. Financial institutions are highly regulated, for-profit enterprises that can only support real economy activities that meet a commercially viable return and cannot responsibly decide to extend capital beyond their risk appetite thresholds to achieve climate ambitions.

From the perspective of financial institutions, strong and well-coordinated policy frameworks at the national, regional and international levels are needed to support real economy transition, which will provide opportunities for financial institutions to provide supporting finance and investment. Key factors to be considered include:

- Policy clarity and certainty, underpinned by scientific evidence,
- Providing incentives,
- Developing infrastructure,

- Addressing both the supply and demand sides of emissions reduction,
- Pricing Carbon Emissions,
- Promoting a just transition, job creation and economic growth,
- Financial institutions are both producers and users of transition plans - they conduct their own transition planning, and also rely on the transition planning conducted by their clients, counterparties and investees as summarized in their transition plans,
- Financial Institutions' transition strategies may involve a spectrum of activities aimed at facilitating and supporting transition of real economy clients and investees, including, developing new expertise, expanding new green and transition-related activities, products and services, and investing in the managed reduction and phase-out of high-carbon technologies and assets,
- Transition Finance generally focused on financial instruments and related services extended with the aim of reducing emissions of key sectors and economic activities that will be economically essential through the transition, even if they are high-emitting today.
- There are many different financial products that constitute "transition finance," including those proposed by the International Energy Agency, GFANZ, OECD, and United Nations,covering products such as: (a) Sustainability-linked loans and revolving credit facilities, with interest margins linked to emissions performance,(b) Sustainability-linked bonds, with emissions-linked performance targets,(c) Labelled financial products (e.g. transition bonds), allocating capital towards a specific transition or sustainability-related objective.

	Financed Emissions	**Facilitated Emissions**
Reporting FIs	- Banks: Commercial, Investment and Development Banks - Insurance Firms - Asset Managers/Owners & Custodians	- Large International Banks - Investment Banks - Brokerage Services
Asset Class and products covered by PCAF standards	- Listed equity and corporate bonds. - Business loans and unlisted equity - Project finance - Commercial real estate - Mortgages - Motor vehicle loans - Sovereign debt	- Facilitated issuance of new: o Public debt: all types of bonds issued for general purposes. o Public equity: common stock (IPOs and follow-on issuances) and preferred shares - Facilitated equity & debt investments in private companies - Syndicated loans
Formula	$\sum_c Attribution\ factor_c \times Emissions_c$ $\downarrow$ $\left(\frac{Outstanding\ balance}{Company\ value}\right)_c$ - $Input\ (a)$: $Attribution\ factor_c$ - $Input\ (b)$: $Emissions_c = client\ \ emissions$	$\sum_c Attribution\ factor_c \times Emissions_c \times Weighting\ factor$ $\downarrow$ $\left(\frac{Facilitated\ Amount}{Company\ value}\right)_c$



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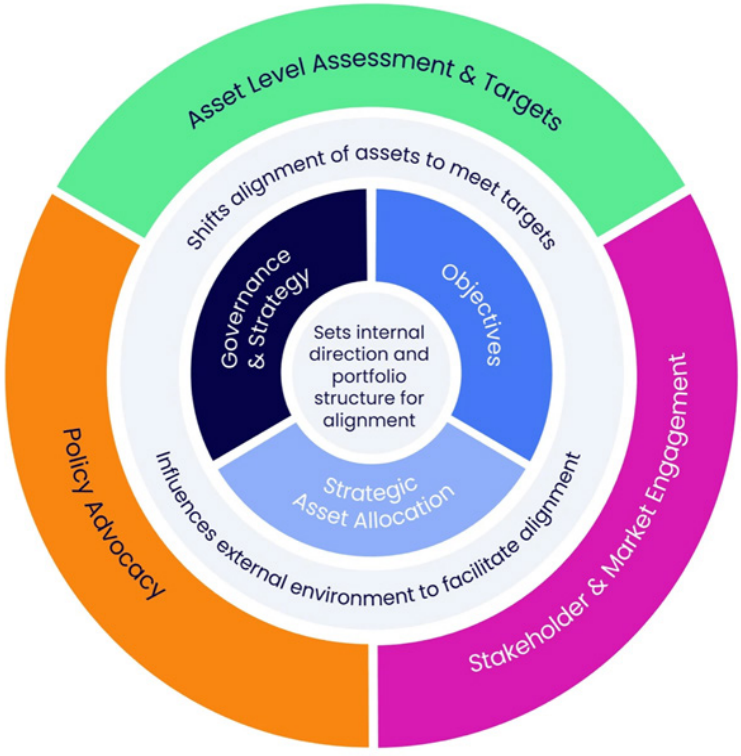

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Net-Zero Financing & Investment - International Best Practices

Guidelines on the Management of ESG Risks - European Banking Authority (EBA)

The European Banking Authority (EBA)has published its final Guidelines (9th January 2025) on the management of Environmental, Social and Governance (ESG) risks. The Guidelines set out requirements for the financial institutions for the identification, measurement, management and monitoring of ESG risks, including through plans aimed at ensuring their resilience in the short, medium and long term.

Salient Features -

1. ESG risks, in particular environmental risks through transition and physical risk drivers, pose challenges to the safety and soundness of institutions and may affect all traditional categories of financial risks to which they are exposed. To ensure the resilience of the business model and risk profile of institutions in the short, medium and long term, the guidelines set requirements for the internal processes and ESG risk management arrangements that institutions should have in place.

2. Institutions, based on regular and comprehensive materiality assessments of ESG risks, should ensure that they are able to properly identify and measure ESG risks through sound data processes and a combination of methodologies, including exposure-, portfolio- and sector-based, portfolio alignment and scenario-based methodologies.

3. Institutions should integrate ESG risks into their regular risk management framework by considering their role as potential drivers of all traditional categories of financial risks, including credit, market, operational, reputational, liquidity, business model, and concentration risks. Institutions should have a robust and sound approach to managing and mitigating ESG risks over the short, medium and long term, including a time horizon of at least 10 years, and should apply a range of risk management tools including engagement with counterparties. Institutions should embed ESG risks in their regular processes including in the risk appetite, internal controls and ICAAP (Internal Capital Adequacy Assessment Process). Besides, institutions should monitor ESG risks through effective internal reporting frameworks and a range of backward- and forward-looking ESG risk metrics and indicators.

4. Institutions should develop specific plans to address the risks arising from the transition and process of adjustment of the economy towards the regulatory objectives related to ESG factors of the jurisdictions they operate in. To this end, institutions should assess

and embed forward-looking ESG risk considerations in their strategies, policies and risk management processes through transition planning considering short-, medium- and long-term time horizons.

5. Climate change, environmental degradation, biodiversity loss, social issues and other environmental, social and governance (ESG) factors pose considerable challenges for the economy. The impact of acute and chronic physical risk events, the need to transition to a low-carbon, resource-efficient and sustainable economy, as well as other ESG challenges, are causing and will continue to cause profound economic transformations that impact the financial sector.

6. Environmental risks, including climate-related risks, are expected inter alia to become even more prominent going forward through different possible combinations of transition and physical risks. These may affect all traditional categories of financial risks to which institutions are exposed. In addition, institutions' counterparties or invested assets may be subject to the negative impact of social factors, such as breaches of human rights, demographic change, digitalisation, health or working conditions, and governance factors, such as shortcomings in executive leadership or bribery and corruption, which may in turn lead to financial risks that institutions should assess and manage.

7. To maintain adequate resilience to the negative impacts of ESG factors, institutions need to be able to systematically identify, measure and manage ESG risks. However, the specificities of ESG risks such as their forward-looking nature and distinct impacts over various time horizons, as well as the lack of relevant historical experience, means that understanding, measurement and management practices can differ significantly across institutions.

Principles (USA Department of Treasury)

In recent years, financial institutions including over 100 U.S. firms, have independently made voluntary net-zero commitments. Successful execution of such commitments can help firms mitigate exposure to climate-related risk and unlock economic opportunities. The principles focus on financial institutions' scope 3 financed and facilitated greenhouse gas (GHG) emissions, which are typically the largest type of emissions for financial institutions. Scope 1 GHG emissions are directly attributable to an entity's owned or controlled sources, scope 2 GHG emissions are emissions that come from purchased energy, and scope 3 GHG emissions are indirect emissions included in a company's value chain.A financial institution's strategy, business model, size, client base, products and services, and fiduciary, regulatory, and legal obligations will affect its approach to the net-zero transition, including whether and to what extent it may choose to apply the principles. Significant changes and improvements in climate science and climate-related strategy and risk management are likely to occur over time, which will affect the relevance and efficacy of the principles.

- **PRINCIPLE 1**: Banking institution's net-zero commitment is a declaration of intent to work toward the reduction of greenhouse gas emissions. Commitments be in line with limiting the increase in the global averagetemperature to 1.5°C. To be credible, this declaration should be accompanied or followedby the development and execution of a net-zero transition plan.
- **PRINCIPLE 2**: Financial institutions should consider transition finance, managed phaseout, and climate solutions practices when deciding how to realize their commitments.
- **PRINCIPLE 3**: Financial institutions should establish credible metrics and targets and endeavour, over time, for all relevant financing, investment, and advisory services to have associated metrics and targets.
- **PRINCIPLE 4**: Financial institutions should assess client and portfolio company alignment to their (i.e., financial institutions') targets and to limiting the increase in the global average temperature to 1.5°C.
- **PRINCIPLE 5**: Financial institutions should align engagement practices - with clients, portfolio companies, and other stakeholders - to their commitments.
- **PRINCIPLE 6**: Financial institutions should develop and execute an implementation strategy that integrates the goals of their commitments into relevant aspects of their businesses and operating procedures.
- **PRINCIPLE 7**: Financial institutions should establish robust governance processes to provide oversight of the implementation of their commitments.
- **PRINCIPLE 8**: Financial institutions should, in the context of activities associated with their net-zero transition plans, account for environmental justice and environmental impacts, where applicable.

- **PRINCIPLE 9**: Financial institutions should be transparent about their commitments and progress towards them.

Summary of the Principles for Net-Zero Financing & Investment

PRINCIPLE 1: A financial institution's net-zero commitment (commitment) is a declaration of intent to work toward the reduction of greenhouse gas emissions. Treasury recommends that commitments be in line with limiting the increase in the global average temperature to 1.5°C. To be credible, this declaration should be accompanied or followed by the development and execution of a net-zero transition plan.

PRINCIPLE 2: Financial institutions should consider transition finance, managed phaseout, and climate solutions practices when deciding how to realize their commitments.

PRINCIPLE 3: Financial institutions should establish credible metrics and targets and endeavor, over time, for all relevant financing, investment, and advisory services to have associated metrics and targets.

PRINCIPLE 4: Financial institutions should assess client and portfolio company alignment to their (i.e., financial institutions') targets and to limiting the increase in the global average temperature to 1.5°C.

PRINCIPLE 5: Financial institutions should align engagement practices — with clients, portfolio companies, and other stakeholders — to their commitments.

PRINCIPLE 6: Financial institutions should develop and execute an implementation strategy that integrates the goals of their commitments into relevant aspects of their businesses and operating procedures.

PRINCIPLE 7: Financial institutions should establish robust governance processes to provide oversight of the implementation of their commitments.

PRINCIPLE 8: Financial institutions should, in the context of activities associated with their net-zero transition plans, account for environmental justice and environmental impacts, where applicable.

PRINCIPLE 9: Financial institutions should be transparent about their commitments and progress towards them.

PRINCIPLE 1: Financial institutions should develop net-zero targets or goals (targets) that reflect measurable milestones toward achieving their commitments. Net-zero metrics (metrics) are used to measure and track progress toward meeting target(s). A financial institution net-zero transition plan is the set of goals, actions, and accountability mechanisms, including practices, metrics, and targets, designed to meet a commitment and deliver GHG emissions (emissions) reductions across all emission scopes in line with achieving global net zero. The principles focus on financial institution financed emissions, which are typically the largest type of emissions for financial institutions. Financial institution net-zero efforts should aim to enable emissions reductions by their clients and portfolio companies. Enabling emissions reductions primarily involves engaging with clients and portfolio companies to support them intaking the actions needed to better manage risks and opportunities associated with the net-zero transition, includingimplementing robust net-zero transition plans. In some cases, financial institutions might choose to reallocatefinancing, investment, and advisory services away from clients and portfolio companies that over time act in waysinconsistent with a financial institution's commitment and transition plan. In those cases, such reallocation canreduce a financial institution's exposure to companies facing high transition risk.

A robust net-zero transition plan should generally address: (i) the firm's overall commitment and priority practices; (ii) metrics and targets; (iii) implementation processes and structures (i.e., the ways in which internal business and operating procedures, products, services, and policies reflect the firm's commitment); (iv) engagement strategy (i.e., the ways in which engagement with external stakeholders - like clients, portfolio companies, and other stakeholders - is prioritized and made consistent with the financial institution's commitment); and (v) governance (i.e., the oversight structures and processes put in place to build an environment of trust, transparency, and accountability necessary for successful execution of the financial institution's net-zero transition plan).

Net-zero transition plans should be updated regularly, particularly as new technologies, methodologies, and emerging best practices enable financial institutions to increase the scope of their net-zero-aligned activities or as changes to climate science and the markets in which the institutions operate necessitate adjustments. Approaches to net-zero transition planning are still being developed and refined. Financial institutions should adopt flexible approaches that allow for improvements over time and comparability with peers.

"Financial Institutions" refer to only those firms that have made or are making a commitment."Financing, Investment, and Advisory services" include many forms of financing and investment, assetmanagement, debt and equity capital markets facilitation activities, and similar products and services provided by banks and non-banks,including corporate and project financing provided to publicly listed or private companies. "Clients and Portfolio Companies"include companies that are recipients of financing, investment, oradvisory services from financial institutions"."Transition Plan" refers to either or both (i) any internal-facing

processes, documents, communications, orresources that outline and guide a firm's transition plan goals, actions, and accountability mechanisms in the context of this definitionand (ii) any external-facing communications meant to inform stakeholders (e.g., investors, clients, portfolio companies, civil society,governments, and others) of this information.

Principles 2-8 relate to net-zero transition plan development and implementation.

PRINCIPLE 2: Financial institutions should consider transition finance, managed phaseout, and climate solutions practices when deciding how to realize their commitments.

Practice 1 - Transition Finance: This practice involves provide financing, investment, or advisory services to clients and portfolio companies that are implementing measures to significantly reduce the emissions from their goods or services. Transition finance can support decarbonization in high-emitting sectors for which decarbonization is particularly difficult due to the current limitations in technological viability and/or price competitiveness of low-emissions alternatives. Decarbonization in these historically "hard-to-abate" sectors may entail capital intensive and high upfront costs for critical production technologies. Transition finance can also apply to sectors other than those considered hard-to-abate. Clients and portfolio companies may be "aligned" (i.e., their emissions profiles are in line with limiting the increase in the global average temperature to 1.5°C, and the transition finance will enable them to maintain that alignment) or "aligning" (i.e., their emissions profiles demonstrate the need to make changes to their operations or business models to be in line with limiting the increase in the global average temperature to 1.5°C, and transition finance will support them in doing so). To be considered "aligned" or "aligning," a client or portfolio company should at a minimum demonstrate historical evidence of progress to decarbonize, have set interim and end-state targets, and demonstrate serious intent to achieve its targets, such as by taking concrete actions related to governance and implementation.

For example, a financial institution could provide capital to a steel company that is acquiring lower-emitting electric arc furnaces. An institution providing transition finance should be able to explain how its financing results in reductions of its client's or portfolio company's emissions. Such activity benefits the net-zero transition when it results in a client or portfolio company aligning with limiting the increase in the global average temperature to 1.5°C.

Practice 2 - Managed Phaseout: A subset of transition finance, this practice involves financing, investing, or advisory services that support a managed and accelerated transition from high-emitting to zero- or near-zero emissions assets. This includes early decommissioning, which may include repurposing strategies. Managed phaseout can help avoid the stranding of assets while reducing global emissions. Financial institutions' managed phaseout activities should demonstrate adherence to strict activity criteria and verification requirements. Given the potential for greenwashing in this practice, phaseout processes should be transparent and invite accountability.

Practice 3 - Climate solutions: This practice involves financing, investing, or advisory services that support innovation and the adoption of zero- or near-zero-emissions technologies, services, or products that will contribute to the elimination, removal, or reduction of real economy emissions by replacing, significantly reducing demand for, or repurposing high-emitting alternatives. Examples include scaling up zero- or near zero- emissions technologies as well as nature-based solutions and carbon removal technologies. Financing, investing in, and advising on climate solutions can promote technological innovation, production innovation, and at-scale adoption.

For example, capital directed to a utility company replacing coal power with solar and wind generation may be both transition finance and investment in at-scale adoption of climate solutions. In line with transition finance practices, the utility company's overall emissions footprint is being reduced over time (e.g., in line with limiting the increase in the global average temperature to 1.5°C). Additionally, in line with climate solutions practices, the financial institution's capital helps enable the utility company's deployment of zero or near-zero-emissions assets (e.g., solar arrays). This example would not be considered managed phaseout unless the coal or other high-emitting asset is retired before the end of its scheduled useful life.

PRINCIPLE 3: Financial institutions should establish credible metrics and targets and endeavour, over time, for all relevant financing, investment, and advisory services to have associated metrics and targets. Financial institutions should, in a manner that is consistent with their fiduciary, regulatory, and legal requirements:

- Set interim targets for 2030 or sooner and at no more than five-year intervals thereafter until the end-state target of 2050 or sooner.
- Over time, endeavour for targets to cover all relevant financing, investment, and advisory services for clients and portfolio companies.
- Appropriately tailor targets to specific sectors/portfolios and asset classes. For areas of the business or geographies for which this is not immediately feasible due to lack of available or fit-for-purpose methodologies or data, financial institutions should commit to work towards full coverage of relevant business activities, which could include participation in the development of additional methodologies and reporting practices.
- Rely on resources and emerging industry practices that utilize the latest science and methodological advances when defining target-relevant terms, data, and calculations.

Financial institutions should select the credible target-setting approaches that are most appropriate for them while seeking to adhere to industry best practice, where appropriate. Target-setting methodologies, particularly related to the practices outlined below, are still being developed and refined.

- **Targets associated with transition finance** should be consistent with credible benchmarks (e.g., 1.5°C science based sectoral pathways and benchmarks incorporating such pathways14, 15); include all GHGs (e.g., methane and nitrous oxide in addition to carbon dioxide) when measurable; cover client and portfolio company scope 1, scope 2, and, when material and quantifiable, scope 3 emissions; and incorporate both intensity metrics, which allow for more effective comparisons among entities within a sector (particularly when based on physical production), and absolute emissions reduction metrics, which are necessary to assess progress towards economywide targets. Whether absolute or intensity metrics are more suitable for a target may vary by firm, sector, and applicable benchmark or framework. Sectoral pathways and reliable client and portfolio company scope 3 emissions data are inputs to target setting that will likely become more readily available over time as stakeholders further develop methodologies and improve scope 3 data availability. Financial institutions should work to overcome barriers to integrating sectoral pathways and client and portfolio company scope 3 emissions data into measurement and target-setting efforts.
- **Targets associated with managed phaseout**, in addition to incorporating the guidance for transition finance, should additionally consider emissions reductions from early retirement activities and measures to mitigate negative and unintended consequences.
- **Targets associated with climate solutions**, should measure the amount of capital deployed toward climatesolutions (broken out, if appropriate, by type of solution) and year-over-year changes in capital deployed.

Depending on the nature of its commitment and priority practices, a financial institution should consider settingtargets and tracking performance in ways that reflect the coverage and progress of the financial institution's ownnet-zero efforts.Further, in tracking any financed emissions targets for a portfolio of assets, financial institutions should endeavour to calculate and disclose the proportion of emissions reductions due to changes in underlying client and portfoliocompany emissions.

PRINCIPLE 4: Financial institutions should assess client and portfolio company alignment to their targets and to limiting the increase in the global average temperature to 1.5°C. Robust approaches to assessing client and portfolio company alignment may include the use of:

- Classification systems and lifecycle emissions calculation tools to evaluate whether or the extent to which an activity or company can be considered a climate solution.
- Benchmarks like sectoral pathways, which are based on carbon budgets estimated to keep certain global warming temperature increases within reach.
- Client and portfolio company net-zero transition plans.

In the context of transition finance and managed phaseout practices, "alignment" can be

considered the degree to which a company's behaviour and emissions trajectory, taking into account its carbon budget, would support an outcome aligned with limiting the increase in the global average temperature to 1.5°C if all economic actors behaved similarly relative to their own carbon budgets. In the context of climate solutions, "alignment" can be considered the extent to which a company provides or enables zero- or near-zero-emissions technologies, services, or products that will contribute to the elimination, removal, or reduction of real economy emissions by replacing, significantly reducing the demand for, or re-purposing high-emitting alternatives. Financial institutions should develop and disclose their preferred approaches to assessing alignment of clients and portfolio companies. The most appropriate approach for a financial institution to use will depend on the nature of the asset, client, or portfolio to which the approach is applied and the jurisdiction(s) in which the financial institution operates.

- **Classification systems**: In the context of climate solutions, classification systems such as sectoral and economicactivity-based categorizations or lifecycle emissions calculation tools can be appropriate ways to assess client andportfolio company alignment. However, to be maximally useful, such classification systems should be consistentor translatable across financial institutions and stakeholders. Such convergence has not yet been achieved.
- **Benchmarks**: In the context of transition finance and managed phaseout, sectoral pathways - when they areavailable and scientifically sound - can be effective benchmarks for assessing the net-zero alignment of clients andportfolio companies. Depending on their design, credible sectoral pathways assess data such as absolute emissionsmetrics, emissions intensity metrics, technology characteristics, or projections of future emissions reductions - alongside historical emissions reductions - to help judge the degree to which a client or portfolio companyis aligned or aligning to limiting the increase in the global average temperature to 1.5°C. Other benchmarks andforward-looking alignment metrics based on sectoral pathway benchmarking (e.g., implied temperature rise metrics)may also be applicable.
- **Client and Portfolio company net-zero transition plans**: Client and portfolio company net-zero transitionplans are useful for assessing alignment in the context of transition finance and managed phaseout. Client andportfolio company net-zero transition plans, similar to financial institution net-zero transition plans, shouldinclude the following: (i) overall commitment and strategy; (ii) metrics and targets covering scope 1, scope 2, and,when material and quantifiable, scope 3 emissions; (iii) implementation processes and structures (iv) engagementstrategy (especially with value chain participants); and (v) governance. The contents of each component in aclient or portfolio company transition plan will depend on the characteristics of that company. Reliable client andportfolio company scope 3 emissions data will become more readily available over time as

stakeholders, includingfinancial institutions, further develop methodologies and improve scope 3 data availability.

Client and portfolio company transition plans should provide sufficient clarity to financial institutions about whether a given client or portfolio company is aligned or aligning to limiting the increase in the global average temperature to 1.5°C. Financial institutions should have processes in place to assess the strength of client and portfolio company net-zero transition plans and outcomes. Such assessments should consider:

- Forward-looking metrics or information regarding the company's business plan, including any interim and end state targets it has set - and whether those have been verified by a third-party.
- How transparent the company is regarding the data, methodologies, and targets that underpin its net-zero transition plan, including its emissions footprint, which should include scope 1, scope 2, and, when material and quantifiable, scope 3 emissions.
- Evidence - if available - of a track record of progress, including changes in historical emission levels, past changes in business operations to be more net-zero-aligned, or similar indicators.
- Governance and accountability mechanisms set up by the client or portfolio company, including whether leadership is held accountable for the implementation of the net-zero transition plan.
- The degree to which the information provided enables a comparison with like companies.

Financial institutions may experience the temporary misalignment of a client, portfolio company, or portfolio if it has significant operations in or exposure to emerging markets and developing economies where the net-zero transition is in earlier stages.

This may occur, for example, when the best available benchmarks and classification systems do not factor in emerging markets and developing economy contexts. Relatedly, it may be appropriate to adjust targets by geography.

In all cases, temporary misalignment due to financing or investments in high-emitting emerging market and developing economies assets would not justify a financial institution's prolonged misalignment with its commitment.

PRINCIPLE 5: Financial institutions should align engagement practices - with clients, portfolio companies, and other stakeholders - to their commitments.

One of the most effective ways for clients and portfolio companies to improve their emissions profiles and align with limiting the increase in the global average temperature to 1.5°C is to develop and execute their own net zero transition plans. Given that a financial institution's financed emissions reflect the emissions of its clients and portfolio companies, a financial

institution's net-zero transition plan should - to the extent consistent with fiduciary, regulatory, and legal obligations - include a strategy for collaborating with and supporting relevant clients and portfolio companies to adopt and implement net-zero transition plans. These transition plans will facilitate clients' and portfolio companies' ability to better manage climate-related risk and take advantage of significant financial opportunities related to the transition. These plans may also generate financing, investment, and advisory opportunities for net-zero-committed financial institutions.

Engagement should be consistent with a financial institution's degree of ownership of and influence over the client or portfolio company as well as the institution's investment and financing strategy. Financial institutions should justify and be transparent about their approaches to phasing in this type of engagement with relevant clients and portfolio companies. In some cases, a financial institution's net-zero-related engagement with clients and portfolio companies may not sufficiently leverage the financial institution's expertise, influence, and resources in the context of its commitment and transition plan. To avoid potential "paper engagement," financial institutions should establish transparent processes for meaningful engagement and track the efficacy of such processes. Financial institutions should further decide the terms or timeframe under which they would consider changes in their engagement approach. These changes could include deepening or lessening engagement based on client or portfolio company activity or disengaging from a given client or portfolio company that does not sufficiently manage the risks and opportunities associated with the transition.

There are gaps in available and fit-for-purpose methodologies for assessing client and portfolio company alignment, and a need for continued improvement of target-setting methodologies. Financial institutions should consider how to work with relevant stakeholders to improve methodologies and approaches.

PRINCIPLE 6: Financial institutions should develop and execute an implementation strategy that integrates the goals of their commitments into relevant aspects of their businesses and operating procedures. Financial institution net-zero transition plans should, in a manner consistent with their fiduciary, regulatory, and legal requirements, consider:

- Leveraging existing or creating new products (e.g., green financial instruments and tools) and services that support client and portfolio company efforts to transition to net zero.
- Establishing policies and conditions - or a timeline for establishing them - related to activities in sectors highly relevant to the net-zero transition (e.g., thresholds or boundaries for financing, investment, and advisory services for select activities that will face greater challenges as the transition continues).
- Incorporating net-zero objectives and practices in core evaluation and decision-making processes (e.g., by incorporating relevant considerations into portfolio management,

transaction approval, due diligence, marketing, and sales processes).

- Incorporating net-zero objectives into resource allocation and business planning.

PRINCIPLE 7: Financial institutions should establish robust governance processes to provide oversight of the implementation of their commitments.A financial institution should fully integrate the implementation of its transition plan into its governance and enterprise risk management systems and define governance-related policies, procedures, and processes concerning the financial institution's commitment and transition planning activities. Such policies, procedures, and processesshould address board oversight, senior management roles and responsibilities, relevant skills and culturedevelopment among staff, incentives and remuneration, and any other relevant accountability mechanisms. Afinancial institution's governance structure should allow for regular review of the net-zero transition plan by the boardand senior management to incorporate material developments, address implementation challenges, and identify andmitigate risks to the transition plan."Governance" refers to Board Oversight, Roles and Responsibilities, Corporate Culture, Incentives and Remuneration and Skills, Competencies, and training."Business and Operating Procedures" (Principle 6) refers to Business and Financial Planning Practices, Business-Strategy-related Policies and Conditions, and Product and Service offerings.

PRINCIPLE 8: Financial institutions should, in the context of activities associated with their net-zero transition plans, account for environmental justice and environmental impacts, where applicable.A financial institution should demonstrate an understanding of how transition planning activities may impact issues including but not limited to employment, quality of life, affordability, rights, and access to resources, particularly for Tribes, indigenous peoples, and disadvantaged communities in the places where the financial institution operates.If overlooked, environmental justice and just transition of the workforce considerations can also have financial implications for financial institutions. Proactively engaging excluded and marginalized populations can help to address these concerns and improve financing and investment sustainability.Further, financial institutions should demonstrate an understanding of how transition planning activities may impact the environment, including nature and biodiversity. Financial institutions should put safeguards in place to account for unintended consequences and consider emerging frameworks and resources that seek to protect nature and biodiversity.In many cases, the public sector should and does play a leading role in reducing or addressing negative impacts from climate change mitigation activities like those referenced above.Significant changes and improvements in net-zero-related activities are likely to occur over time, including how suchactivities intersect with and incorporate actions related to climate resilience and adaptation, biodiversity, nature,environmental justice, and addressing the just transition of the workforce.

PRINCIPLE 9: Financial institutions should be transparent about their commitments and progress towards them.

Appropriate transparency is part of a credible commitment and is necessary for external accountability. Transparencyenables stakeholders to develop a reasonable understanding of how a commitment impacts a financial institution'slending, investing, advisory, and operational decisions. In some cases, this may involve voluntary public disclosuresexceeding those required by applicable law. Disclosed information should include relevant data and data sources,frameworks and methodologies leveraged (e.g., related to transition planning), approaches to and progress ofclient and portfolio company engagement, and other key decisions that a financial institution makes in developingand executing its transition plan. When an institution cannot conform to emerging best practice as it relates tocommitments, it should explain the reasons.

Transparency of quantitative information that reflects progress towards targets (e.g., the measurement of financedemissions) is particularly important to the evaluation of financial institution net-zero activities. Sufficient informationshould be disclosed such that targets and progress towards them can be reasonably compared to what is disclosed byother firms and needed by stakeholders to assess a financial institution's overall progress towards its commitment.

There remain challenges related to data quality and availability, particularly regarding client and portfolio companyscope 3 emissions. While such challenges should not preclude measurement efforts, they can impact the ability offinancial institutions, clients, and portfolio companies to precisely measure and communicate progress towardstheir targets. Data quality and availability challenges represent a priority for market participants, civil society, andgovernments to resolve.Some financial institutions may supplement direct value chain emissions reduction measures with the voluntarypurchase of carbon credits. A financial institution should provide sufficient information to give stakeholders a clearunderstanding of whether and/or the extent to which the voluntary use of carbon credits is part of its commitment.

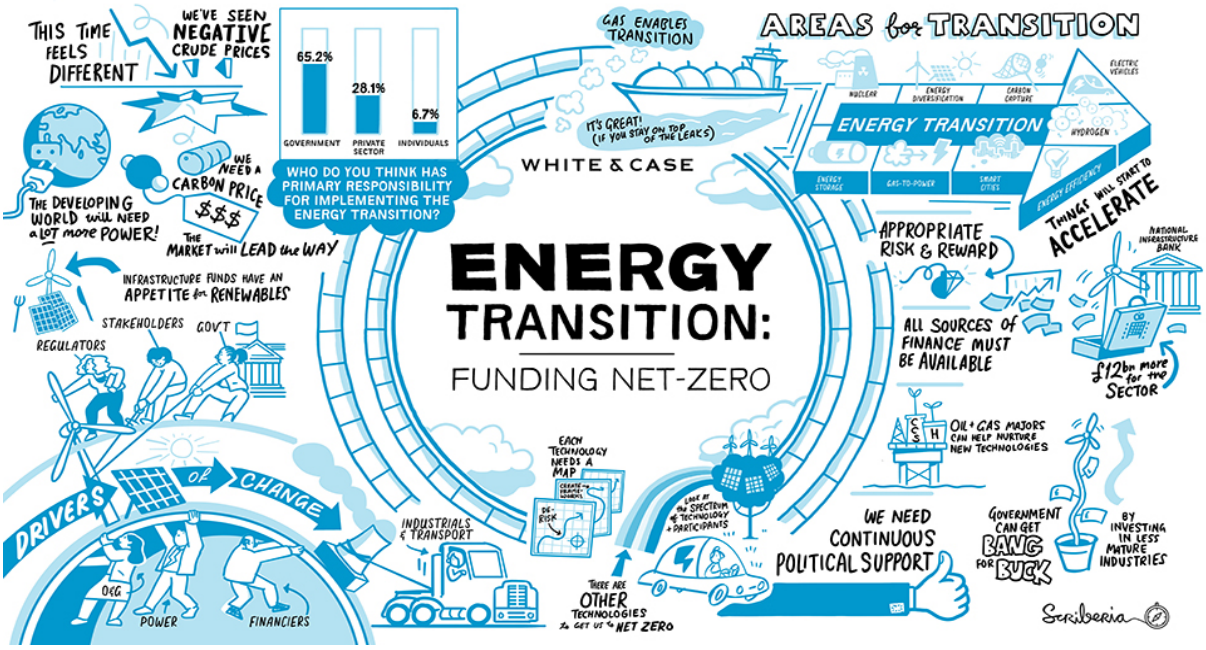
Any voluntary use of carbon credits should be accompanied by sufficient detail on the nature and integrity of thosecredits (e.g., linkages to a credible certification standard and demonstration of sufficient monitoring, reporting,and verification). Voluntary carbon markets (VCMs) remain relatively small and face challenges related to markettransparency and credit integrity. However, high-integrity VCMs represent potentially important channels forunlocking significant capital to climate-impactful investments that can help limit the increase in the global averagetemperature to 1.5°C.Finally, financial institutions should determine in what format to publish information about their commitments inlight of evolving practices. Regardless of format, such information should be made easily accessible to stakeholders,such as in a regular publication or periodic filings. In addition, to improve accountability, enable system-wideassessment, and improve comparison with peers, financial institutions should consider reporting relevantinformation to resources that aggregate and disseminate this information.

Mitigation Areas and Adaptation Area

Mitigation Areas
Power (Solar Rooftop, Offshore Wind, Nuclear, Grid Storage, Grid Modernisation)
Transport (Fuel cell vehicles, Battery electric vehicles, Waterways, Freight modernization, Battery storage)
Land use and oceans (Land degradation, Agroforestry, Blue economy)
Industry (Energy efficiency, Green hydrogen, Hydrogen storage, Carbon capture and utilization)
Infrastructure (Buildings and construction, Energy efficiency)
Waste management and circular economy (Material efficiency, Waste and wastewater management)

Adaptation Areas
Agriculture (Drought- and pest-resilient crops, Water efficiency, Improved and efficient practices, Crop diversification, Agroforestry)
Disaster management (Early warning system, Climate proofing infrastructure and cities)
Biodiversity (Conservation and management of mangroves and coral reefs, Coastal zone management)
Health (Health infrastructure)

Financing the Net Zero Transition



Source as detailed on page nos. 178 & 179

A financial institution's net-zero transition plan is the set of goals, actions, and accountability mechanisms, including practices, metrics, and targets, designed to meet a commitment and deliver GHG emissions (emissions) reductions across all emission scopes in line with achieving global net zero.

Net zero can be important to investors for several reasons. Investors may be interested in monitoring progress toward net zero because the extent and speed of emission reduction and removal will likely be an important factor in the degree of climate risk exposure their investments will face in the future. In addition, investors may be interested in how policymakers might implement commitments to reduce net greenhouse gas (GHG) emissions because those decisions may be highly consequential, in both positive and negative ways, to certain companies, industries, and regions - and thus, their portfolios. Finally, many asset owners and individual investors have concluded that climate change mitigation serves their interests and therefore, they are not only interested in monitoring progress toward net zero but also want to contribute to its realization. In short, net zero may be important from the perspectives of risk-return, values alignment, and impact.

Governments are responsible for determining how to respond to climate change, and their responses are typically classified as adaptation or mitigation. Net zero falls in the latter category because it seeks to address the root cause of climate change namely, the GHG

emissions that are produced by human activity. Governments have been working together for decades to mitigate climate change. International cooperation started in 1994 with the United Nations Framework Convention on Climate Change (UNFCCC), which has now been ratified by nearly every country in the world. With the 2015 Paris Agreement, nearly every country and/or government agreed to emissions reduction commitments to limit the global temperature increase as soon as possible.

Investors are important to net zero primarily because the amount of financing needed to achieve it is beyond what public finance can provide. Attaining net zero will likely cost more than $100 trillion. A 2022 McKinsey report titled "The Net-Zero Transition" estimated that "capital spending on physical assets for energy and land-use systems in the net-zero transition between 2021 and 2050 would amount to about $275 trillion, or $9.2 trillion per year on average, an annual increase of as much as $3.5 trillion from today" and that "in comparative terms, the $3.5 trillion is approximately equivalent, in 2020, to half of global corporate profits, one-quarter of total tax revenue, and 7 percent of household spending".

In addition, most carbon-emitting assets are privately owned. The replacement of carbon-emitting assets might serve the overall good of society, but certainly debate exists about the extent to which public money should be used to update and enhance privately owned assets, especially as there are other means by which policymakers might incentivize decarbonization. Climate change mitigation, like past socioeconomic transitions, is likely to be financed through a combination of public and private finance.

IEEFA's View

GFANZ four transition financing strategies	Categories for activities and entities	Key considerations when screening opportunities: Science-based taxonomy tool	Feasibility assessment	Use-of-proceeds criteria	Transition plan assessment	Suggested relationships among general, green transition finance	
Climate solutions	Sustainable and enabling **activities**	✓		✓		**Green finance**	
	Sustainable and enabling **entities**	✓		✓		**Green finance** (pure-play or use-of-proceeds ringfencing)	
Aligned	Aligned **entities**		✓		✓	**Transition finance** (high-emitting, "hard-to-abate" sectors)	**General finance** (other sectors)
Aligning	Aligning **entities**		✓		✓	**Transition finance** (high-emitting, "hard-to-abate" sectors)	**General finance** (other sectors)
	Transitional **activities**	✓	✓	✓		**Transition finance**	
Managed phaseout	Managed phaseout **activities**	✓	✓	✓		**Transition finance**	

Source as detailed on page nos. 178 & 179

Challenges of Net Zero Banking

Achieving net zero emissions can be a complex and multifaceted challenge for the banking sector that requires transformative changes across several sectors of the economy. Here are some of the challenges that need to be addressed to achieve net zero emissions:

- **Transforming the energy sector** - The energy sector is responsible for the largest share of global greenhouse gas emissions, and transitioning this sector to clean, renewable energy supplies such as wind, solar, and hydropower is critical to achieving net-zero emissions. However, this requires a massive overhaul of energy infrastructure, including developing new storage technologies and building new grids to transport energy.
- **Creating resilient nature markets** - Nature-based solutions such as reforestation, afforestation, and soil carbon sequestration, as well as the creation of carbon, biodiversity, and plastic credits, require strict oversight and verification and continuous stakeholder engagement and investment to ensure long-term effectiveness. These markets are still emerging, and now is the time to establish appropriate and effective regulations, processes, and verification standards.
- **Implementing carbon capture technologies** - Carbon capture and storage (CCS) technologies can capture carbon dioxide emissions at their source and store them underground or repurposethem for industrial uses. These technologies are still in their early stages and require significant investment and development, but they prove to be promising in the long term.
- **Creating science-based targets** - Science-based targets are crucial in setting emissions reduction goals that align with the Paris Agreement and follow principles proved by climate science.
- **Addressing social and political realities** - The transition to net zero must take into account the social and political realities that shape the global economy, including issues of environmental justice, poverty, equity, fairness, and the need for global cooperation.

Banking institutions have a significant role to play in advancing net-zero by 2050. The sector is already showing an appetite for this challenge and an undertaking to help green the global economy. A growing number of banking institutions have pledged to make their portfolios net-zero by 2050 or sooner, and a few have already started measuring their financed emissions. However, measuring financed emissions is a complex challenge further hindered by the lack of a single global measuring standard, common database to source the data, or data framework for what data companies should measure.

Banking institutions can start to build a robust approach for measuring their financed emissions with five practical steps. They are -

- Align their strategy and business model with their sustainability goals,
- Recognize measuring financed emissions is a new area of responsibility,
- Determine which type of assets their portfolio contains and what activities are in scope,
- Determine data sources and overcome gaps in their data by calculating an approximation,

Finally, calculate their emissions using existing methodologies as a guide.

Banks cannot fix the Climate Crisis alone

As emissions continue to rise, and the far-reaching climate impacts rapidly shrinks, it is important to ask what role banks can realistically play. Can banks alone really help fix the climate crisis? No, Banks cannot fix the climate crisis alone.

The progress in the power generation, energy storage, and transport sectors in some developed and emerging markets is really encouraging. As more countries recognise the growth and opportunity that the transition to net zero can bring, they have implemented significant demand incentives, carbon pricing, and other policies that are supporting investment. Yet, no government in the world yet has comprehensive policies that fully align with meeting the Paris Agreement goal of limiting warming to 1.5 degree centigrade.

Voluntary action by banks is no panacea for gaps in climate policy. To attract the additional financing needed to transform the global economy and for banks to meet their 1.5C-aligned goals, governments need to take the next step, creating further policies, incentives and frameworks to support more sectors of the real economy in more markets to decarbonise. This will require bringing in and scaling up established green technologies in new markets, the commercialisation of further technologies, and ensuring the transition is just and inclusive.

If they do, banks are better prepared than ever before to play their part. When the Net-Zero Banking Alliance (NZBA) launched in April 2021, no bank had set science-based 2030 sectoral targets aligned to the Paris Agreement goal to limit warming to 1.5C. Today, more than 100 banks, well over two-thirds of NZBA 's membership, have done so.In the last three years, NZBA banks have each independently dedicated significant resources to measure their emissions, set targets, develop transition plans, and upskill colleagues, boosting their ability to support clients seeking to decarbonise their businesses. They have developed new sustainable and transition finance solutions and provided trillions of dollars in green and transition finance to support clients on their climate journeys.

They have partnered with governments and public finance providers to address barriers to the net zero transition, for instance, by contributing to Just Energy Transition Partnerships that aim to support coal-dependent countries to shift to low-carbon energy while maintaining economic growth, social development, energy access, and energy security.

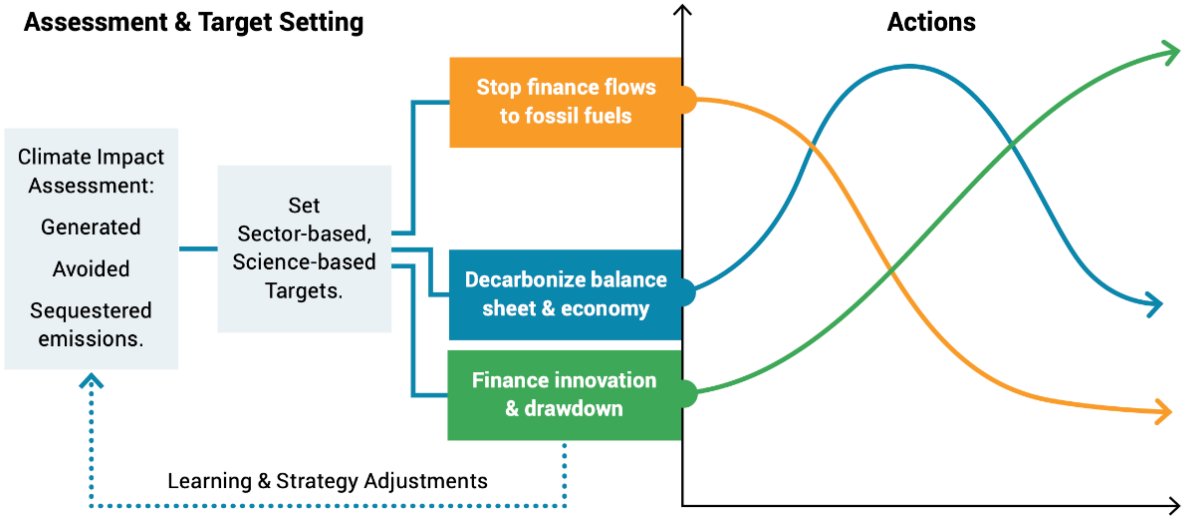
How to help the banks to develop credible commitments?

NZBA guidance supports banks in setting credible and comparable targets and in determining the sectors, targets and mix of strategies that make most sense for their individual institutions.

This approach reflects not only the vastly different economic, legal and regulatory environments in which member banks operate, but also their varied client bases and business models. NZBA member banks are disclosing unprecedented amounts of information on their targets, transition plans, and attributable annual greenhouse gas emissions, on both an emissions intensity and absolute emissions basis.

But, to end, banks cannot do this alone. Translating ambition into meaningful emissions cuts requires partnerships between policymakers, banks, and the real economy. Inaction means squandering hard-fought progress when the world can least afford it.

Three horizons model for Climate Safe Lending



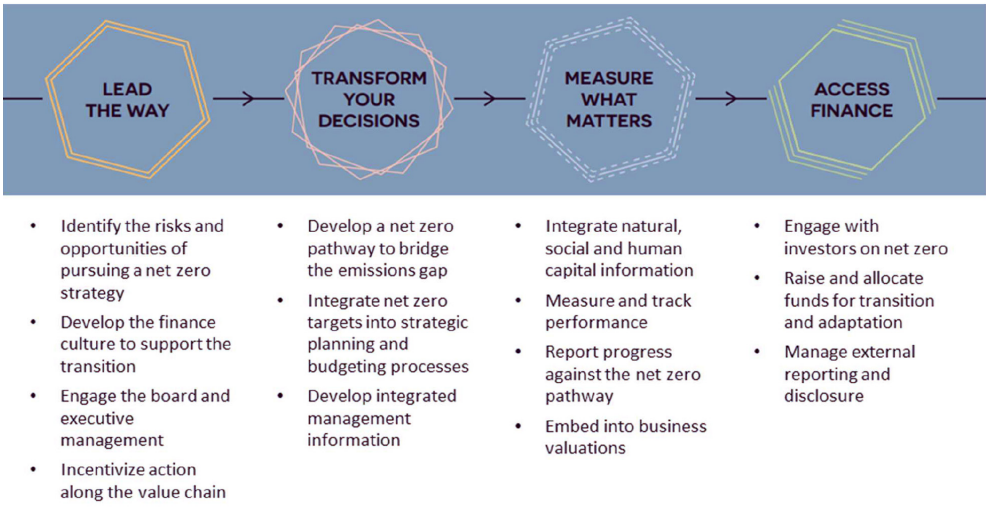
Source as detailed on page nos. 178 & 179

Net Zero Banking Challenges - Beyond target-setting

Good practice for ten key elements of national net zero target setting

Scope	**Target year**		
	Emissions coverage	**International aviation and shipping**	**Reductions or removals outside of own borders**
	All sectors and gases covered	The net zero target fully covers emissions from international aviation and shipping	Reaching net zero within own borders
Architecture	**Legal status**	**Separate reduction & removal targets**	**Review process**
	Legally binding target	Separate targets for emission reductions and removals	Legally binding review of target and progress against it at regular intervals
Transparency	**Carbon dioxide removal**	**Comprehensive planning**	**Clarity on fairness of target**
	Transparent & scientifically robust assumptions on LULUCF and carbon removals & storage	Transparent and scientifically robust pathway / intermediate targets with clear measures for achieving net zero	Clear statement on why the target is fair

https://climateactiontracker.org/countries/india/net-zero-targets/



Source as detailed on page nos. 178 & 179

For banks to help their customers and become stewards of their transition to net zero, they need to progress beyond the initial steps of measuring baselines and setting targets in order to tackle the crux of the challenge: drive the actual reduction of emissions with their customers. The companies in their lending and investment portfolios need banks to encourage and steer the transition - no single sector is currently on track to reach its 2050 net zero goals.

The middle-market segment in particular is struggling to identify the best starting point, or is discouraged by the scope and complexity of the undertaking. Banks are ideally placed to provide the vital assistance companies require to decarbonize and become net zero.

Banks have a unique opportunity to forge much closer ties with their corporate customers that could yield value for many years to come. But first they need to recognize that the journey to sustainability requires profound changes in both their relationships and their portfolios. These in turn require changes to the business strategy.

Banks need to get to the crux of their journey to net zero (The crux: actual reduction of CO2e): High level commitment or, ambition to become net zero

- **Establish emission baseline** - Collection of emissions data from customers and external vendors for their Scope 1 & 2 emissions,
- **Set ambition and define time horizon** - Selection of method and potential affiliations (e.g. SBTi), as well as time horizons to start on decarbonization pathways and scenarios,
- **Compute distance to net zero targe** - Calculation of the gap between the current portfolio and the net zero target. Identification of the actions required in each sector, geography and entity,
- **Set action plan and steering mechanisms** - Development of action levers that can be modelled top-down and verified bottom-up for portfolio decarbonization strategies (grow green, engage customers, reduce),
- **Monitor and report on portfolios** - Enhancement of monitoring systems to enable better decisions by management and front-line staff that optimize for profitability and the wellbeing of the planet.

As stewards, banks would need to cultivate a deep understanding of each industry and the ability to offer industry-specific support that could include climate-science expertise, emissions measuring and monitoring methodologies, education on climate change and best practices, and access to information hubs and ecosystems. Partnerships would provide banks with opportunities to grow their revenue while helping customers develop and implement effective decarbonization strategies that include emerging technologies, proven climate solutions and new innovations.

Rising to the Challenge of Net Zero Banking

- Many large international banks want to become stewards of the transition to a net zero economy and help their customers decarbonize.
- Four obstacles, or conundrums, are hampering banks on their journey to execute their net zero commitments.
- This report examines how banks can overcome these conundrums and grow their businesses while taking a lead in the transition to a net zero future.

As soaring greenhouse gas emissions threaten the planet, policymakers and regulators around the world are looking to banks to lead the fight against climate change. So far, almost 60% of the world's leading banks have made public commitments to reach net zero carbon emissions and many banks are eager to go a step further. They want to become stewards of the global transition to a net zero economy and guide their corporate customers as they decarbonize. This role would enable banks to extend and strengthen their businesses while also playing a pivotal role in preserving the planet for future generations.

Four major obstacles are hampering banks from achieving this goal:

1) An internal top vs. bottom disconnects - CXO's at many banks want their organizations to become stewards of the transition to net zero. But these banks have often not embedded the cultural and policy changes needed to ensure that all members of the workforce support such ambitions.

2) Banks that have begun their net zero journey with small teams and although programs have been set up, there's an "add on" approach rather than embedding. For an initiative as significant as sustainability in the net zero journey, a full-scale transformation agenda is needed.

3) Many banks have made ambitious sustainable finance commitments. But their "green" product & service offerings are still in their infancy and customer relationships have yet to grow into partnerships.

4) Carbon data: Banks' best friend and worst enemy - Banks recognize that carbon emissions data is vital for their journey to net zero. However, they are often frustrated by difficulties in sourcing reliable and accurate data, as well as by the complexities of integrating such information into their often-fragile legacy systems.

Banks's Organizational transformation is essential - For banks to overcome the obstacles which are hampering their advance to net zero and guide their customer organisations on the path to decarbonization; they must embark on an extensive transformation of all aspects of their internal organizations. It is vital that banks secure support across their organizations for their journey to net zero; tackle the challenge of reaching net zero as a holistic transformation;

train, educate and onboard relationship managers to become 'climate scientists' who can help corporate customers decarbonize and build systematic carbon intelligence throughout their businesses.

The transformation that banks must undergo will certainly be challenging. But the rewards promise to be substantial. Banks that succeed will be stronger and more profitable. Furthermore, they will stand on the right side of history and lead the fight against climate change.The path to net zero will be guided by banks taking an active role as advisors and partners in their customers' journey.

Mastering the challenge of financed emissions - Most of the world's largest banks have committed themselves to becoming net zero across all their activities, yet only 12% of banks are currently on track to reduce their own Scopes 1&2 emissions (from their own operations) by their net zero target date of 2050. What's more, these emissions are just a small fraction of the total emissions for which banks are accountable. Addressing their Scope 3 financed emissions - helping their customers and the companies they have invested in to curreenhouse gas emissions - will have a much greater impact on the banks' progress towards net zero. These financed emissions represent more than 95% of the average bank's overall emissions. Measuring and reducing Scope 3 emissions, over which banks have no direct control, will be a huge challenge. Yet, it is a challenge that lies at the heart of the banks' potential role as stewards of the transition to a net zero economy. Unless banks quickly master the preliminary stages of their own transition to net zero and simultaneously get to grips with their financed emissions, they are likely to fall short of their commitments and miss out on a historic opportunity to broaden and grow their businesses.

Partners in the transition to net zero - To curb their own and their financed emissions, banks need to use their capital resources and close corporate relationships to encourage and assist companies in their lending and investment portfolios to substantially reduce their production of greenhouse gases. There are benefits for all - banks, their customers and their respective industries - when banks become not only trusted advisors but partners in their customers' transition to net zero. Banks that step up to the challenge of helping build a net zero economy will likely pull away from their competitors. Their businesses will become stronger, more diverse and more durable than those of their counterparts that are slower to reorient their portfolios to greener opportunities and fulfil only the minimum regulatory reporting requirements.

Grow green - Advance the transition to net zero by developing a range of green products and services that persuade and enable customers to reduce carbon emissions.

Engage - Work closely with corporate customers to provide them with the expertise, services, resources and finance they need to transition to net zero.

Reduce - As a last resort, scale back relationships with customers that do not progress on the journey to net zero.

Net-Zero-Banking: Creating along-term and Sustainable Financial Services Sector

Source as detailed on page nos. 178 & 179

Net-Zero Banking - A bank's pledge to achieve net-zero carbon footprint by balancing the amount of greenhouse gases (GHGs) removed from the atmosphere with the amount released into the atmosphere.

The financial services sector is becoming more and more aware of its vital role in assisting in the transition to a low-carbon economy and a sustainable future, as the world approaches a key turning point in the fight against climate change. The concept of net-zero banking, which seeks to integrate financial services with social and environmental sustainability objectives, is thus becoming increasingly important to the global efforts towards tackling climate change.

Banks must address every aspect of sustainability. However, presently, they seem to be contributing to both aspects of moving towards a green future. On the one hand, they support efforts to decarbonise the economy while on the other hand, they also help finance businesses that emit carbon dioxide. In this dual capacity, banks become potent catalysts that cause a seismic shift in the statistics related to climate change worldwide.

Globally, the market for sustainable finance is expected to develop significantly, with projections indicating that it will rise to USD 23 trillion by 2031.

Sustainable finance refers to the process of taking environmental, social and governance (ESG) considerations into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects. Sustainable finance is important to understand how finance help sustainable development and mitigate climate risk. Climate change is making its presence felt in different forms such as extreme weather conditions, water scarcity, melting icebergs, etc. It makes it imperative to develop a lower carbon economy.

Five pillars of sustainable finance are -

- **Pillar 1: Definition: Use of proceeds** - This pillar focuses on clearly defining how the proceeds from sustainable finance instruments (like green bonds) will be used, ensuring they are directed towards projects with clear environmental or social benefits.
- **Pillar 2: Selection: Process for project evaluation -** This pillar emphasizes a robust process for evaluating and selecting projects that align with sustainability goals, ensuring they meet specific criteria and standards.
- **Pillar 3: Traceability: Management of proceeds** - This pillar emphasizes a robust process for evaluating and selecting projects that align with sustainability goals, ensuring they meet specific criteria and standards.
- **Pillar 4: Transparency: Monitoring and reporting** - This pillar stresses the importance of transparently monitoring and reporting on the performance of sustainable projects and the impact of sustainable finance instruments, allowing stakeholders to assess their effectiveness.

- **Pillar 5: Verification: Assurance through external review** - This pillar highlights the need for independent verification and assurance mechanisms to ensure that projects and financial instruments are truly sustainable and that their impact is accurately reported.

Need for Net-Zero Financing - It is imperative that we confront climate change, the Intergovernmental Panel on Climate Change (IPCC) recommended keeping global warming to 1.5°C over pre-industrial levels in order to prevent any further deterioration of the global climate. However, the adverse consequences of climate change are unavoidable for global markets, as the current temperatures are already 1.1°C beyond the established thresholds. Therefore, businesses need to incorporate robust and effective net-zero initiatives into their fundamental operating frameworks in order to safeguard their long-term sustainability while responding to the changing environmental problems.

Rise of Sustainable Banking - The banking industry's dedication to net zero goals is indicative of the growing popularity of sustainable banking practices. In 2023, the United Nations (UN) convened the Net-Zero Banking Alliance (NZBA), with a membership of 138 of the world's top banks, spanning 44 nations and representing 41% of all banking assets, in order to address this developing threat. The global banking sector, which has an asset under management (AUM) of more than USD 10 trillion, has embraced the challenge of strategically aligning its operations and moving its lending and investment portfolio toward net-zero GHG emissions by 2050, in compliance with the Paris Agreement.

The 'environment' and 'sustainable' components of ESG are being actively incorporated in the internal frameworks of banks, with the 'governance' aspect simultaneously evolving to cater to the former two components. This indicates an emerging era of responsible banking, where the focus is not only on traditional profit-centric models but also on the environmental impact. One of the major aspects within this paradigm is the consideration of financed emissions i.e. emissions resulting from the projects and activities funded by banks.Banks have often come under scrutiny due to their role in financing activities that contribute to GHG emissions. As societies and regulators intensify their focus on mitigating climate change, banks are increasingly evaluating the environmental impact of the projects they now fund. In order to finance green projects, support renewable energy efforts and encourage energy efficiency, they are implementing sustainable banking practices. This ultimately lowers the total carbon footprint linked to their financial activities.

Indian commercial banks heading towards Net Zero – Indian Government has created the provision of INR 350 billion (USD 4.2 billion) for the net-zero transition during the Budget 2024. The Securities and Exchange Board of India (SEBI) has also developed a framework for sustainable issuance and modified the disclosure guidelines for green debt.

Green Finance Initiatives in India - Indian commercial banks have been supporting green finance programmes over the past ten years, allocating funds to projects aimed at fostering

environmental sustainability. These programmes cover a wide range of sectors, such as sustainable agriculture, energy efficiency and renewable energy. The Reserve Bank of India (RBI) published a Framework for Acceptance of Green Deposits on 11 April 2023, with the goal of promoting, fostering and developing a sustainable financial ecosystem in the country. With the implementation of this framework on 1st June 2023, banks and non-banking financial institutions (NBFCs) can be encouraged to offer green deposits, thereby facilitating the financing of environmentally sustainable projects and activities for their portfolio consumers. This framework is aimed at protecting the interests of depositors, helping clients achieve their sustainability goals, addressing issues with green washing and encouraging more credit flow to green initiative-aligned projects. Establishing a comprehensive board-authorised policy, especially for green deposits, is mandatory for banks and NBFCs. All information pertaining to the issue and distribution of green deposits should be included in this policy. To guarantee the effective distribution of green deposits, these institutions must also put in place a Financing Framework (FF) that has been approved by the board.

Of the 34 scheduled commercial banks in India, which include public, private and foreign banks, 85% agreed to make structural changes to their current lending and investing approach to support green financing, according to RBI's Report of the Survey on Climate Risk and Sustainable Finance. Among other considerations, a majority of banks (56%) have also chosen to progressively lessen their exposure to companies that emit or pollute a considerable amount of carbon in the upcoming years.

Financial Sector's Role in Driving the Sustainability Agenda -

- **Unlocking the Power of Capital Allocation** - Financing Sustainable Solutions, Divesting from Unsustainable Practices, ESG Integration, Supporting research and development.
- **Shaping Corporate Behaviour** - Engaging with Companies, Setting Standards and Frameworks, Building Capacity and Awareness.
- **Building a Sustainable Financial System** - Transparency and Disclosure, Innovation and Technology, Collaboration and Partnerships.
- **Challenges and Opportunities** - Short-termism and lack of long-term vision, Limited data and standardized metrics, Limited data and standardized metrics.

Green Finance's growing impact on India's Net Zero Transition

- Green finance is gaining momentum in the Indian economy as a crucial tool for transitioning toward net zero emissions.
- The integration of environmental considerations into financial decision-making is crucial for sustainable development.
- Initiatives like green bonds, carbon pricing, and sustainable investment strategies are driving the shift toward a greener economy in India.

Green finance is playing a crucial role in India's transition towards net zero by providing significant capital for investments in renewable energy, electric vehicles, and other low-carbon technologies, enabling the country to achieve its ambitious climate goals while also facilitating economic growth by directing funding towards sustainable projects and incentivizing businesses to adopt environmentally friendly practices; however, challenges remain in mobilizing sufficient capital to meet the substantial investment needs required to reach net zero by 2070.In addition to the government and companies, there is increased interest from banks, NBFCs, venture capitalists and PE funds in green finance opportunities.

As one of the world's largest emitters of greenhouse gases, India requires a huge budget (approximately USD 12 trillion to accomplish its net zero emissions target by 2070). Several measures are underway in the public and the private sector, leading to increased investment and financing opportunities. One of them being green finance - a sustainable or responsible finance that effectively finances projects with environmental benefits, such as reducing greenhouse gas emissions, improving energy efficiency, or enhancing the circular economy.

Future of Green Finance in India - Reserve Bank of India (RBI) has introduced guidelines for banks and non-bank financial companies (NBFCs) to accept "green deposits". The purpose is to ensure funds are utilized for energy efficiency, clean transportation, climate change adaptation, sustainable water and waste management, green buildings, and terrestrial and aquatic biodiversity conservation. As the demand for green finance grows, India is expected to see more innovative financing solutions and investment opportunities in the green sector. The Securities and Exchange Board of India (SEBI) introduced an ESG category of mutual funds. Asset management companies in India can now launch more than one ESG fund, and as reporting on such parameters improves, the increased rigor and transparency will boost investor confidence. While anticipating government action on green financing, including tax breaks for low-carbon technologies, policy pushes for green financing instruments etc.,

it is equally important for private sector organizations to adopt internal carbon pricing and promote investment in green technologies and solutions.

While green finance may not be a silver bullet for addressing environmental and social challenges, it is critical to promote sustainable and responsible investment practices and encouraging companies to prioritize these issues. Government, academia, and industry collaborations, advocacy on new policies, and public-private partnerships is necessary to ensure the effective roll out of innovative green financing mechanisms to boost the transition to a net zero economy by 2070.

Financing Emissions - How Indian Banks Can Drive the Net-Zero Transition

Bankers need to deepen their understanding of emerging low-carbon technologies and investment opportunities to drive India's decarbonization efforts. Achieving India's net- zero target requires swift financing of innovative technologies such as electric vehicles, green hydrogen, battery storage, and low-carbon steel.

Indian banks can drive the net-zero transition by actively managing "financed emissions," meaning the greenhouse gas emissions generated by the projects and companies they fund, by prioritizing green lending towards renewable energy, energy efficiency initiatives, and sustainable infrastructure, while phasing out financing for high-carbon emitting industries, thus incentivizing businesses to decarbonize and contributing significantly to India's climate goals.

Key strategies for Indian banks to drive the net-zero transition through financed emissions management:

- **Measuring and reporting emissions:**

  Develop robust methodologies to accurately calculate the carbon footprint of their loan portfolios, including Scope 1, 2, and 3 emissions, to understand their contribution to climate change.

- **Setting ambitious targets:**

  Establish clear, science-based targets for reducing financed emissions across their loan portfolios, aligning with India's net-zero goals.

- **Portfolio analysis and risk assessment:**

  Regularly evaluate the climate risks associated with their loan portfolios and identify opportunities to shift investments towards low-carbon sectors.

- **Green loan products and incentives:**

  Develop specialized green loan products with attractive interest rates to encourage businesses to invest in sustainable projects.

- **Engagement with clients:**

  Actively engage with borrowers to discuss decarbonization strategies, provide technical support, and set sustainability performance metrics.

- **Climate-related disclosure:**

  Enhance transparency by regularly disclosing information about their climate-related risks and mitigation efforts through sustainability reports.

- **Capacity building:**

  Train staff on climate change issues, sustainable finance practices, and methodologies for assessing financed emissions.

- **Collaboration with stakeholders:**

  Partner with government agencies, industry associations, and other financial institutions to develop standards, best practices, and supportive policy frameworks for green finance.

Focus areas for Indian banks to prioritize green lending:

- **Renewable energy:** Funding solar, wind, and other renewable energy projects.
- **Energy efficiency:** Supporting energy-efficient upgrades in buildings and industrial processes.
- **Electric vehicles:** Financing the purchase of electric vehicles and charging infrastructure
- **Sustainable agriculture:** Providing credit for climate-resilient farming practices
- **Green infrastructure:** Investing in sustainable transportation, water management, and waste treatment projects

Potential benefits for Indian banks:

- **Reduced climate risk:**

  Mitigating financial risks associated with climate change impacts like extreme weather events.

- **Enhanced reputation:**

  Attracting environmentally conscious clients and investors by demonstrating commitment to sustainability.

- **Market opportunities:**

  Accessing new markets and investment opportunities in the growing green finance sector.

Challenges for Indian banks:

- **Data availability:** Difficulty in accurately measuring financed emissions due to limited data and reporting standards.
- **Market incentives:** Lack of clear policy frameworks and financial incentives to promote green lending.
- **Client engagement:** Persuading businesses to transition towards sustainable practices.

India - Fuelling Transition Financing

Transition finance refers to the investments meant to decarbonize high-emitting and hard-to-abate industries such as steel, aviation and shipping. This capital is also aimed at addressing potential social impacts associated with decarbonization, including unemployment and loss of tax revenue for local governments.

India presents a unique case of balancing decarbonisation efforts with industrial growth. While notable progress is being made in decarbonising the power and transport sectors, reducing industrial emissions poses a formidable challenge. To meet its decarbonisation targets, India will need massive capital flows, projected at US$10.1 trillion by 2070. **While green finance will support technologies that align with the Paris Agreement, transition finance is essential for sectors lacking viable green alternatives**. This is especially crucial given the increasing likelihood of stringent carbon border adjustments. Transition finance plays a pivotal role in helping India's energy-intensive industries, such as steel, cement, and aviation - reduce their carbon footprint and navigate the impacts of protectionist domestic policies. This brief examines the vital role of both green finance and transition finance in addressing the decarbonisation needs of hard-to-abate sectors, which collectively account for over 40 percent of global emissions.

Transition Finance vs. Green Finance - Financing transition will require a combination of green finance and transition finance.

Green Finance: Financing technologies that produce (near-)zero emissions and are aligned with the Paris Agreement. For example, investing in utility or rooftop solar or wind energy projects.

Transition Finance: Financing to reduce emissions for hard-to-abate sectors or technologies that are important for emissions reductions in other sectors (as enablers). In most cases, these activities are not aligned with the Paris Agreement but are important due to the lack of suitable 'green' alternatives. Unlike green finance, transition finance allocates capital to companies and activities that are not "green" but are in the process of "becoming green" or reducing emissions (therefore lowering their exposure to transition risks), emphasising both inclusiveness and environmental integrity to avoid green washing. Therefore, transition finance caters to the decarbonising priorities of energy-intensive and hard-to-abate sectors that cannot be green in the short term due to the lack of green alternatives which are economical or technically feasible. For example, financing a project aimed at improving the efficiency of refrigeration and air-conditioning (RAC) equipment or bonds issued by a natural gas company to retrofit gas transmission and distribution networks to reduce methane leakage and facilitate the introduction of hydrogen.

A cornerstone of India's climate transition plan is to shift towards a high-efficiency, low-emission power sector. Transitioning to a high-efficiency, low-emission power sector requires significant capital outlay, not only for new low-emission generation capacity but also for the necessary transmission infrastructure.

Blended Finance for Climate Investments in India

Blended finance connects interests across the capital stack to achieve climate goals by leveraging private sector investment. Public-private-philanthropic partnerships can unlock untapped capital and accelerate green market transformations. The most common forms of company-level blended finance are equity investments, below-market loans or local currency loans, as well as credit guarantees for the repayment of principal and interest on corporate loans or bonds.

Blended finance is the strategic use of development finance from public and philanthropic sources to mobilise additional capital from the private sector towards sustainable development. Typically, grant funding is blended with other sources of capital such as debt or equity to maximize funding and social impact capacity.

Blended finance lets investors choose different risk tolerances while all participating in the same project. Often used in real estate transactions, it is also proving to be an effective way to get capital to critical, but hard-to-fund projects. The focus should be towards development impact. Blended Finance should also ensure competitive approaches and support that includes equal information, requirements and standards be applied to different market participants.

Blended finance enhances the impact of philanthropic and government funding by leveraging the funds to unlock the trillions of dollars of commercial capital available in the global market to finance socio-economic development. This innovative financial structuring is used to re-balance the risk–return profiles of pioneering, high-impact investments that would otherwise be deemed too risky to fund. The catalytic nature of such transactions allows governments and foundations to address market failures by utilising their corpus of funds judiciously.

There are three 'dimensions' that are essential to any Blended Finance intervention:

01) LEVERAGE - Use of development finance and philanthropic funds to attract private capital

02) IMPACT - Investments must be targeted towards concrete social or environmental impact

03) RETURN - Financial return for a set of investors, based on risks and pricing of impact

From the year 2026-2030, India will require annual clean energy investments in the range of $253- $263 billion (rising to $325-$355 billion over 2031-2035) to align with sustainable development and climate goals.

The blended finance approach is based on the idea that risk needs to be re-distributed. In blended finance arrangements, public finance, sometimes combined with philanthropic capital, take over an important part of the risk mitigation to allow private investors to step in later.

Blended finance works through combining resources from different sectors to enable impact-focused projects to scale. This can help de-risk projects, improve their financial viability, reduce investment costs, and catalyse further support from other funders.

RBI's Disclosure Framework on Climate-related Financial Risks

On 28 February 2024, the Reserve Bank of India (RBI) issued draft guidelines on 'Disclosure framework on climate-related financial risks, 2024'. The framework mandates disclosure by regulated entities (REs) on four key areas of governance, strategy, risk management and metric and targets. The central banking regulator recently released a discussion paper on climate risk, sustainable finance and the framework for acceptance of green deposits. The current disclosure framework is a step towards bringing the climate risk assessment, measurement and reporting requirements under mainstream compliance framework for financial sector entities in India. This move will help incorporate climate-related issues in the overall organisational culture, policies and operations.

Applicability - These guidelines are applicable to all scheduled commercial banks (SCBs) (excluding local area banks, payments banks and regional rural banks), tier-IV primary (urban) co-operative banks (UCBs), All-India Financial Institutions (AIFIs) and top and upper layer non-banking financial companies (NBFCs). Other entities may voluntarily make these disclosures.

Framework at a Glance - Climate-related disclosures by REs aim to provide information on relevant risks encountered and approaches adopted to address these issues. It enables different stakeholders (e.g. regulators, investors, depositors and customers) with important sources of information that can help them make informed decisions. There is a need for REs to assess and disclose their climate-related financial risks, given its growing importance and relevance. The key thematic areas included under the climate risk financial disclosures are discussed below:

- **Governance** - This pillar captures details relating to the governance structure of the REs for effective oversight and management of climate-related financial risks and opportunities. An entity is required to disclose the board and senior management's roles in the assessment and management of the climate risks and opportunities.
- **Strategy** -This pillar focuses on the entity's strategy in identifying climate-related financial risks and opportunities which may have material financial impact on the organisation. This would require the entities to identify risks and opportunities over different time horizons (i.e. short, medium and long-term) undertake impact assessment, set targets and test the climate resilience of the entity's strategy through stress tests and scenario analysis to manage them.
- **Risk Management** - This pillar focuses on procedures for recognising, evaluating and incorporating climate-related financial risks and opportunities within the overarching risk management structure. The entities are required to transparently disclose their policies and procedures for managing climate-related risks and opportunities, establish frameworks and methods for identifying and quantifying these risks, and integrate them into the existing risk management framework of the entity.

- **Metrics and Targets** - The disclosures on metrics and targets are aimed to provide information on the entity's performance vis-a-vis its climate-related financial risks and opportunities. This would include disclosure on key risk indicators (KRIs) identified, targets set against them and regular updates on progress towards achieving these targets.

Timelines - Recognising that the disclosure requirements for REs would require time to develop internal policies and reporting mechanism, the RBI has provided a staggered approach for the adoption of the guidelines, with additional time provided for disclosing data related to metrics and targets. Tier-IV UCBs are also given an additional year for the adoption of the guidelines. The implementation timeline is outlined below:

Regulated Entities (REs)	Governance, Strategy and Risk management	Metrics and Targets
SCBs, AIFIs, Top and Upper layer NBFCs	FY 2025-26 onwards	FY 2027-28 onwards
Tier-IV UCBs	FY 2026-27 onwards	FY 2028-29 onwards

The RBI rightfully recognises that the detailing of the disclosures should vary based on the size, scale and complexity of the operations of the REs. It has accordingly segregated the disclosure requirements into basic and enhanced disclosures, with enhanced disclosures being voluntary for some entities.

How can REs ensure compliance? - With the release of the 'Disclosure framework for climate-related financial risks, 2024' guidelines, the regulator has made its intention clear on compliance to climate-related disclosures. However, climate risk is an emerging risk, and different REs may be at different maturity levels in their understanding and assessment of climate-related financial risks. In our view, regulatory guidance will continue to evolve - given the diverse challenges in evolution and adoption of climate risk-related frameworks. Some key areas that entities can consider fulfilling as they embark on their climate risk management journey are listed below.

a) Governance -

- Entities will have to work on defining the governance structure for looking at the climate-related risks and opportunities from the board and senior management levels. This would entail clearly defining the roles and responsibilities of the personnel – i.e. defining the scope and periodic reviews at all levels.
- Entities would need to develop a climate risk management policy detailing the governance structure, role of the board and senior management, detailing the internal mechanisms towards managing climate-related risks and opportunities.
- Entities must invest in up skilling/hiring of the personnel with required competencies to ensure adequate board-level governance and managerial oversight.

b) Strategy -

- Entities must start with an internal assessment of the impact of climate-related issues that they are exposed to. This may have an impact on their business model, risk appetite, portfolio composition and key financial indicators.
- Climate-based scenario analysis6 is an effective tool to run various scenarios on the entities to identify the potential risks and their impact on the entity's strategy across different time horizons.

c) Risk Management-

- Entities should develop methodologies and carry out physical7 and transition8 risk assessment on their own operations and lending portfolios.
- As part of the ICAAP, a suitable stress testing and scenario analysis methodology should be developed by the entity.
- Integrate climate risk assessment into the overall risk management framework by suitably consolidating them in the entity's internal capital adequacy assessment process (ICAAP) and internal liquidity adequacy assessment process (ILAAP) to provide qualitative and quantitative assessment of the identified risks, their impact and mitigation plans.

d) Metrics and Targets -

- Entities must look at the various policies and processes to be set up towards managing the climate-related risks and opportunities and appropriately define the KRIs for all the related stakeholders.
- Set time-bound targets, including interim milestones, for the respective KRIs and develop internal processes to measure and report the progress towards these targets of the entity.
- Develop internal capabilities to report financed emissions for the entity.
- Develop data collection capabilities to capture appropriate data required towards internal and external reporting.

The RBI's draft framework for climate risk disclosure represents a significant milestone in India's journey towards climate resilience in the financial sector. By promoting transparency, accountability and risk management practices, the framework lays the foundation for a more resilient and sustainable financial system. The draft guidelines provide an overarching and detailed climate risk management requirement for REs, aligned with globally available disclosures standards like Task Force on Climate-related Financial Disclosures (TCFD), Basel Committee on Banking Supervision (BCBS) and IFRS S2 disclosures. As stakeholders provide feedback and the framework evolves, collaboration between regulators, financial institutions and other stakeholders will be key to effectively address climate risk and ensure a smooth transition to a low-carbon economy.

Sustainable Finance and Climate Risks for Indian Banks

Banks, regulators, policymakers and industry bodies must collaborate to develop comprehensive strategies for climate resilience. This includes incorporating climate risk considerations into risk management frameworks, enhancing climate- related disclosures and promoting sustainable finance practices.

Climate-related financial risks have the potential to affect the safety and soundness of banks through physical and transition risks, which affect various sectors of the economy and may affect access to financial services and fair treatment of customers. The core risks faced by banks include Credit, Interest Rate, Liquidity, Price, Foreign Exchange, Transaction, Compliance, Strategic and Reputation. These categories are not mutually exclusive; any product or service may expose the bank to multiple risks.

Climate disasters can damage the infrastructure of financial institutions, resulting in casualties among business personnel. This effect, in turn, can disrupt the continuity of financial institution operations, leading to operational disruptions and business interruptions.

Sustainability risks are in complex cause-effect relationships: on the one hand between customers, service providers and the bank, and on the other hand between the individual types of financial and non-financial risks. These need to be made transparent and appropriately considered in the risk management process.

The concept of sustainable finance is a multifaceted domain that has evolved significantly over the recent years. Sustainable finance is a suite of financial mechanisms strategically designed to enhance economic growth, while addressing environmental concerns and incorporating considerations of social and governance dimensions. At its core, this approach emphasizes transparent disclosure of Environmental, Social and Governance (ESG) risks that could impact the financial system. Moreover, sustainable finance involves adept governance of financial and corporate entities to effectively mitigate such risks. Essentially, it encompasses the mobilization of financial resources to promote inclusive growth, aligning financial strategies with broader ESG objectives.

Sustainable finance in banking is a term that describes the use of financial tools and strategies to achieve environmental and social goals. It encompasses various activities, including ESG (environmental, social, and governance) investing, responsible banking practices, impact investing, and philanthropic funds.

The primary objective of sustainable finance lies in the integration of ESG factors with decision-making processes, aiming to champion sustainable development and tackle urgent global challenges such as climate change, biodiversity loss, social inequality and human rights concerns. In doing so, sustainable finance goes beyond merely considering financial returns, emphasizing the broader impact of investments on environment, society and corporate governance. This approach acknowledges the interconnected nature of economic, social and

environmental issues, emphasizing the importance of addressing them comprehensively for achieving sustainable and inclusive development.

Recognizing the significance of addressing climate related risks is imperative for Indian banks as the repercussions extend across multiple dimensions. Climate-related risks encompass potential threats arising from climate change with substantial economic and financial consequences. These risks manifest through two primary channels: physical risks and transition risks.

Physical risks involve economic costs and financial losses stemming from the increasing frequency and severity of extreme climate-related weather events, longer-term gradual shifts in climate and indirect effects such as the loss of ecosystem services. Geographical variations further influence the impact of physical risks, with potential stresses on expected cash flows and risks to collateral value.

For instance, local or regional weather events may strain cash flows to Regulated Entities (REs), while chronic flooding or landslides pose risks to collateral value held against loans. Severe weather events can also damage a RE's physical property and data centres, affecting its ability to provide financial services.

Transition risks, on the other hand, arise from the shift towards a low-carbon economy and are influenced by climate-related policies, technological advancements and shifts in public sentiment. Mitigation policies, technological innovations and changing customer preferences can significantly impact the economy and financial system. For Indian banks, this necessitates strategic considerations such as potential reduction in financial valuations, changes in credit ratings and the adoption of energy-efficient practices

Climate change demands focused attention and distinctive management due to several unique characteristics. Firstly, its impact is extensive, affecting various businesses, sectors and geographies. Secondly, while there is certainty that a combination of physical and transition risks will occur, the exact timing, outcomes and pathways are uncertain and unevenly distributed globally. This unpredictability challenges the efficacy of historical data and traditional risk assessment methods. Lastly, the concentration of greenhouse gas emissions in the atmosphere holds irreversible consequences for the planet and the actions taken today will determine the magnitude and nature of future impacts. As a result, collective efforts from central banks, financial market participants, businesses, households, Governments, and sectoral regulators are crucial in addressing and mitigating these risks.

Indian banks need to integrate climate-related risks into various risk processes, including credit concentration, underwriting, reputational and strategic risks. Consideration of these risks is vital in preparation of the Internal Capital Adequacy Assessment Process (ICAAP) document, as outlined in the Master Circular on Basel III Capital Regulations by Reserve Bank of India (RBI). Recognizing the evolving nature of climate-related financial risks, their inclusion in ICAAPs also needs to be iterative and progressive. Analytical gaps can be addressed by adapting methodologies and data analysis as these risks mature over time.

Climate Finance -Initiatives from SEBI (Securities Exchange Board of India)

SEBI, the Securities and Exchange Board of India, plays a crucial role in promoting climate finance by encouraging sustainable practices and disclosures within the capital markets, including the issuance of green bonds and ESG-themed mutual funds.

Here's a more detailed look at SEBI's perspective on climate finance:

Regulatory Framework and Initiatives:

- **Green Bonds**: SEBI has guidelines for issuing green bonds since 2017, which were updated in 2023, aiming to facilitate the flow of capital towards sustainable projects.
- **ESG Disclosures**: SEBI has been actively promoting Environmental, Social, and Governance (ESG) disclosures, urging companies to make ESG-related disclosures to stakeholders.
- **Business Responsibility Reports (BRR)**: In 2012, SEBI mandated the top 100 listed entities by market capitalization to file Business Responsibility Reports (BRR) as part of their annual report, and this requirement has been extended to more entities.
- **Business Responsibility and Sustainability Reporting (BRSR)**: SEBI introduced the Business Responsibility and Sustainability Reporting (BRSR) framework in 2021, mandating the top 1,000 listed entities to prepare BRSR reports, and further strengthened it with BRSR Core in 2023, including ESG disclosures for value chain and assurance requirements.

Here's a more detailed breakdown:

Initial Mandate (2021):In 2021, SEBI introduced BRSR, encouraging the top 1,000 listed entities to adopt the framework voluntarily in FY 2021-22.

Strengthening the Framework (2023):To enhance the reliability of ESG disclosures, SEBI introduced BRSR Core in 2023, which includes a set of key performance indicators (KPIs) and metrics under 9 ESG attributes.

Value Chain Disclosures and Assurance: The framework also mandates ESG disclosures for the value chain of listed entities, as per the BRSR Core, along with assurance requirements.

Circulars and Regulations: SEBI issued a circular on July 12, 2023, outlining the framework for BRSR Core, ESG disclosures for the value chain, and assurance requirements.

Amendment to LODR Regulations: The provisions of SEBI (Listing Obligations and Disclosure Requirements) Regulations, 2015 ("LODR Regulations") in this regard, have been amended vide Gazette notification no. SEBI/LAD-NRO/GN/2023/131 dated June 14, 2023.

Expert Committee Recommendations: In May 2024, an Expert Committee made recommendations regarding BRSR, including suggestions for terminology changes, value chain reporting, and voluntary reporting of previous year data.

Green Credit Program: The committee also recommended introducing a leadership indicator under BRSR Principle 6 to track green credit generation by companies and their value chains.

Consultation Paper: SEBI issued a consultation paper on BRSR in May 2024, aiming to ease ESG compliance.

- **Advisory Committee**: In May 2022, SEBI constituted an advisory committee for environmental, social, and governance-related matters in the securities market.
- **ESG Investing**: SEBI recognizes the increasing focus on sustainability investing and the need for a regulatory framework for ESG disclosures, ESG ratings, and ESG investing.
- **Blue Bonds**: SEBI is also introducing blue bonds that would support the sustainable use of ocean resources and improve livelihood and development while preserving the ocean ecosystem.

Climate Finance Taxonomies in India

In her July 2024 budget speech, India's Finance Minister Nirmala Sitharaman announced, "We will develop a taxonomy for climate finance for enhancing the availability of capital for climate adaptation and mitigation."

As India commits to a net zero target, trillions of dollars of investment are required from the public and private sectors to fund sustainable projects and activities. India must explore both domestic and international debt and equity markets to raise green investments of such a massive scale. But the lack of nomenclature that is commonly agreed and benchmarked is one of the biggest challenges to channelling finance towards impactful green investments. This is why India is working on initiatives towards building a sustainable taxonomy, as many countries including the EU, South Africa and China, have already done.

Taxonomy is defined as a study of the general principles of scientific classification. A taxonomy for sustainable finance lays down a uniform criterion for evaluating and classifying activities and investments, based on their support for sustainability goals. Such taxonomies assist investors and other stakeholders in assessing the environmental impact of their investments.

The taxonomy will provide a reference for:

- Mobilizing international and domestic debt and capital at scale to finance the climate, environmental and social priorities
- Tracking debt and capital flow into the climate, environmental and social priorities and encourage disclosure by financial institutions, private and public sector entities
- Redesigning market and policy incentive structures to support the climate, environmental and social priorities

By doing so, it will provide clarity to investors and businesses alike, help solve the existing information asymmetry in the market and boost climate finance.

The Taxonomy Group functions under the Co-Chairmanship of NITI Aayog and the Ministry of Environment, Forest and Climate Change while the United Nations Development Programme serves as the Secretariat to the Task Force.

Indian financial regulators, such as the Reserve Bank of India (RBI), the Securities and Exchange Board of India (SEBI), and the International Financial Services Centres Authority (IFSCA), have taken various initiatives to promote 'green finance'. However, a hurdle in attracting investments in green financing instruments in India is the lack of a clear definition of 'green

finance' and a framework providing uniform eligibility criteria for determining if a project can be considered 'green'. Ambiguity in the understanding of 'green finance' leaves room for multiple interpretations of the term and increases the likelihood of green washing. Enacting a green finance taxonomy in India will help lay down well-defined criteria for identifying green projects.

Indian regulators are mindful of the need for a uniform green taxonomy. The RBI highlighted that a consistent and comparable taxonomy is essential for a well-functioning green finance regulatory framework and the IFSCA has also stressed the requirement of a green taxonomy in India to attract foreign investments. The Ministry of Finance has set up a task force to conceptualize a framework for sustainable financing in India, including drafting a climate finance taxonomy.

Sustainability Report - Leading Indian Bank for FY 2023-24 - Analysis

- Sustainability Highlights
- Bank recognised for Sustainable Success
- Sustainability Roadmap to Future Profitability
- Responsible Banking - Impacting Sustainability beyond Operations
  - Green Energy Initiatives & Products
  - Green/ESG Borrowing through Lines of Credit
  - Financing Infrastructure
  - Financing Renewable Energy Initiatives
  - ESG Due Diligence along with Credit Risk Assessment (CRA)
  - ESG Financing Framework
  - Green Term Deposit
  - Green Financing Framework
  - Green Investments
- Governance - Highest Standards of Ethics & Integrity
- ESG & Climate Finance Unit (CFU) - Roles and Responsibilities
  - End to end oversight for Green Portfolio (liability/asset) of the Bank
  - Climate Finance Policy and Carbon Footprint Monitoring
  - Sustainability Reporting
  - Engagement with Regulators
  - Collaboration with other departments
  - Capacity building for employees
  - Auditing and document maintenance for projects classified under the “Climate/ESG” sector
- Sustainability Governance
  - Board-Approved Sustainability and Business Responsibility Policy (Products and Services Sub-committee)

- Corporate Centre Sustainability Committee (Social and Governance Sub-committee)
- Circle-Level Sustainability Committee (Environmental Sub-committee)

- Bank's Policies and Frameworks
  - Sustainability and Business Responsibility Policy
  - Corporate Social Responsibility Policy
  - Customer Rights, Grievance Redressal and Compensation Policy
  - Anti-Bribery & Anti-Corruption Policy
  - Policy on KYC Standards, AML and CFT Measures
  - Whistleblower Policy
  - Climate Change Risk Management Policy
  - Operational Risk Management Policy
  - Policy on Doorstep Banking for Retail Customers
  - Policy on Issuance and Allocation of Green Deposits
  - Fair Lending Practices Code
  - Business Continuity and Operational Resilience Policy
  - Code of Ethics
  - Equal Employment Opportunity Policy for Persons with Disabilities
  - Policy on Outsourcing (Non-IT)
  - Renewable Energy Policy
  - Electronic Waste Management Policy
  - ESG Financing Framework
  - Cyber Security Policy & Standards
  - Code of Commitment to Customers (BCSBI Code)
  - Garima Policy
  - Information Security Policy & Standards
- Risk Governance and Oversight Structure
  - Risk Management Committee of the Board (RMCB)

- Credit Risk Management Committee (CRMC)
- Market Risk Management Committee (MRMC)
- Operational Risk Management Committee (ORMC)
- Enterprise & Group Risk Management Committee (EGRMC)
- Climate Change Risk Management Committee (CCRMC)
- Risk Frameworks - Enterprise Risk Management (ERM)
- Risk Appetite Assessment
- Risk Culture Assessment
- Material Risk Assessment
- Policies, Procedures & System
- Risk Management
- Credit Risk Management
- Market Risk Management
- Operational Risk Management
- Enterprise and Group Risk Management -> Climate Change Risk Management
- Market Risk Management Policies
- Investment Policy
- Trading Policy
- Market Risk Management Policy
- Market Risk Limit Policy
- Operational Risk Management Policy - Business Continuity and Operational Resilience
- Credit Risk Management Policies
- Credit Risk Management Policy
- Credit Risk Mitigation and Collateral Management Policy
- Credit Risk Data Management Policy
- Credit Risk Model Validation Policy
- Enterprise and Group Risk Management Policies

- Enterprise Risk Management Policy
- Enterprise Model Risk Management Policy
- ICAAP Policy
- Policy on Bank's disclosures under pillar 3
- Group Risk Management Policy
- Group Liquidity Risk Management Policy
- Climate Change Risk Management Policies
- Sustainability and Business Responsibility (BR) Policy
- Climate Change Risk Management Policy
- Integration of Climate Risks into Risk Management Process
- Physical Risk
- Transition Risk
- Climate-related Risk Scenario Analysis
- Building Risk Culture - Sensitising Employees on Risk Management

- Stakeholder Engagement and Materiality Assessment
- Bank's Contribution to SDGs
- Sustainability Reporting through Integrated Reporting
  - Manufacturing Capital
  - Financial Capital
  - Intellectual Capital
  - Natural Capital
  - Human Capital
  - Social Capital - Value Chain Management
- Business Responsibility & Sustainability Reporting (BRSR)
  - Mapping with GRI, TCFD & SASB

European Banking group - Best Sustainable Finance Provider - ESG Report Highlights FY 2023-24 - Analysis

- ESG - Driven by the new strategic plan to 2026, the bank is pursuing the decarbonisation of its portfolios and broadening its range of solutions and partnerships to support the environmental transition. Our ambition is to be the driving force in the transformation of economies, and thus contribute to build a better and sustainable future.
- BUILDING TOGETHER, WITH OUR CLIENTS, A BETTER AND SUSTAINABLE FUTURE THROUGH RESPONSIBLE AND INNOVATIVE FINANCIAL SOLUTIONS
- Maintaining our leadership in ESG remains, now more than ever, central to our strategy. The Group has undertaken new commitments to the environmental transition, accelerating in terms of sustainable finance and reinforcing our contribution to the United Nation's Sustainable Development Goals. We have been pioneers once again, taking major decisions to speed up the reduction of our exposure to the Oil and Gas sector and launching a €1 billion transition fund to support the development of new low-carbon technologies and solutions.
- A clear strategy for a sustainable future - The Group's ambition is supported by a clear strategy: to be a robust bank with solid, sustainable performance that contributes to the UN's Sustainable Development Goals. Reinforcing the bank's solidity is a priority, and is aimed in particular at on strengthening our capital base and structurally improving operational efficiency and profitability. Based on a simplified, synergetic business model, our aim is also to develop sustainable and high-performance businesses by strengthening the value proposition for clients and playing a leading role in the energy, environmental and social transition.
- FINANCIAL TARGETS
  - CET1 ratio of 13% in 2026 (according to Basel IV)
  - Average annual revenue growth of 0-2% between 2022 and 2026
  - Cost/income ratio of less than 60% in 2026
  - Return on tangible equity (ROTE) of between 9% and 10% in 2026
- EXTRA-FINANCIAL TARGETS
  - 80% reduction in the Oil and Gas sector by 2030 (vs 2019) including a 50% reduction by 2025
  - Launch of a €1 billion investment fund to support the transition
  - Over 35% of senior leadership roles worldwide held by women by 2026

- Lead in ESG - the bank is accelerating its ESG ambitions to reinforce its leadership in the environmental transition and its contribution to the UN's Sustainable Development Goals.
- Accelerate the decarbonisation of Group businesses with new targets - the bank is committed to a process of aligning its financing with trajectories compatible with the aim of carbon neutrality in 2050, starting with the most CO2-emitting activities, as defined by the Net Zero Banking Alliance (NZBA). Having largely completed its withdrawal from the thermal coal sector, the Group is setting new targets, including a sharp increase in efforts to reduce exposure to upstream oil and gas, targeting an 80% reduction by 2030 vs 2019 and an intermediate milestone of 50% by 2025 (compared to the previous commitment of a 20% reduction).
- Maintain our best-in-class risk management - Target: net cost of risk between 25 and 30 basis points over the 2024-2026 period, within a stable risk appetite. The Group will maintain clear and consistent credit risk management: prudent origination policy, diversification and low concentration risk, stable market risk appetite, and comprehensive tail risk monitoring. The Group's risk framework continues its holistic approach to risk management including environmental, social and extra-financial risks.
- Sustainability at all levels to deliver sustainable performance - In a world grappling with climate change and environmental challenges, the bank has taken significant strides to consolidate its role in support of the transition to Net Zero. Our commitment to sustainability is embedded in our corporate strategy and purpose, in this pivotal decade to keep the Paris Agreement's goal of limiting the rise in temperatures to 1.5 °C by the end of the century within reach. We are driven by the challenge of the task ahead – to allocate resources effectively and explore new frontiers in the pursuit of positive change, ensuring a fair and inclusive global transition, in line with the United Nations Sustainable Development Goals. Our ambition reflects our desire to make a tangible contribution and is based on positive transformation - through the environmental transition and positive local impact on communities - while being a responsible bank.
- A positive transformation - We have integrated ESG considerations in every aspect of our business. Beyond our commitment to halving our carbon emissions from 2019 to 2030, we are helping our clients in their own transition. For example, relying on our expertise in sectors like road and rail, air transportation, agriculture, shipping, and renewable energy, we propose holistic solutions to our clients, concentrating on their full production and business value chains. We also support emerging champions of the transition. Education plays a crucial role in our transformation, with extensive ESG training empowering our staff to champion sustainability (more than 25% of the staff trained in the Climate Risk at the end of 2023). In addition, we engage with policymakers to drive systemic change. Our experts contribute to policy frameworks with governments, aligning with objectives

such as the Corporate Sustainability Reporting Directive (CSRD), which aims to harmonise sustainability reporting and enhance the availability and quality of ESG data.

- Responsible bank - Being a responsible employer is paramount to us. We strive to cultivate a working environment where our teams are proud to contribute to sustainable development and can realise their full potential through personalised career paths and an inclusive culture. Recognising the intrinsic value of diversity, we are committed to reducing the gender pay gap (€100 million allocated) and increasing female representation in key leadership positions (target of at least 35% women by 2026). We extend our commitment to financial support and strategic philanthropic actions through a Foundation which is focused, among other topics, on social inclusion.
- Lead in ESG - The Group had already committed to contribute €300 billion to sustainable finance between 2022 and 2025, of which more than 80% had been achieved by the end of 2023. In 2023, we set ourselves higher ambitions, such as accelerating the decarbonisation of our business in alignment with the Net Zero Banking Alliance commitment. We are reducing by 80% upstream exposure in our Oil & Gas portfolio by 2030, and, simultaneously, establishing a €1 billion transition investment envelope on our balance sheet. This will support innovation in green technologies, nature-based solutions, and impact-driven investments. We are also expanding our cooperation with key partners in sustainable finance such as the International Finance Corporation, the private sector arm of the World Bank, to join efforts in this collective endeavour. With innovation and determination, the bank is forging a path toward a more sustainable future. We are fully committed to leading, daring, innovating, and building a legacy of positive change.
- INCREASE OUR E&S CONTRIBUTIONS
  - ➢ Accelerate the decarbonisation of our business
  - ➢ Proactively contribute to set new standards and norms
  - ➢ Act for the economic and social development of our local communities
- INVEST FOR A SUSTAINABLE FUTURE
  - ➢ Shift our business mandates, design innovative solutions for our clients
  - ➢ Invest in the Energy Transition
  - ➢ Support nature-based and impact-driven solutions
- LEAD BY EXAMPLE
  - ➢ Be a responsible employer
  - ➢ Establish a Scientific Advisory Council
  - ➢ Halve our carbon emission 2019 to 2030

- PARTNER TO CATALYSE ESG DEVELOPMENT
  - ➢ Partner with IFC to support SDGs
  - ➢ Increase philanthropic actions through our Foundation
  - ➢ Further engage with all stakeholders and coalitions
- We have seen a 40% increase in capital flows into various clean energy technologies and infrastructure since 2020 - so, the momentum is positive, but it is still insufficient to get on track for the Paris Agreement and the net-zero scenario by 2050. Clean energy investments need to double to more than $4 trillion per year by 2030, while continuing to reduce investment in fossil fuels. This is the way to deliver a safer, more sustainable future.
- Accelerate the decarbonisation of our activities - The bank is resolutely pursuing a highly ambitious decarbonisation programme. The Group has adopted a strategy to align its financing portfolios based on two main priorities: manage the reduction in our absolute carbon footprint from fossil fuels and define a plan to lower the carbon intensity of our financing portfolios in other sectors. 2023 was the start of a major new drive to accelerate this alignment. After achieving our initial target to reduce our exposure to the upstream Oil and Gas sector (20% reduction by 2025), we announced a fresh target of an 80% reduction by 2030 vs 2019, with an interim target of a 50% reduction by 2025. That's one of the most ambitious targets in the entire global banking industry. Since 1 January 2024, we have no longer provided funding for or advised on new Oil and Gas Greenfield projects and are phasing out our exposure to upstream Oil and Gas specialists. We have also set new targets (to lower our carbon intensity and raise our alignment score) in the Automotive, Steel, Cement, Commercial Real Estate, Shipping, Aluminium and Aviation sectors.
- Rethink the banking profession - The bank is embedding ESG in its strategy for all its core businesses and has made assisting clients with their transition a priority. Our core businesses are adapting their models and developing their products and services to meet our clients' changing needs. In Global Banking and Investor Solutions, for example, we have developed an internal programme to tailor our services, accelerate the up skilling of our teams and co-construct innovative solutions with our clients addressing their transition challenges. The programme facilitates skills-sharing among the more than 400 professionals from the range of participating sectors, giving them a broader vision of the challenges facing clients. It also brings new value chains into sharper focus and provides a deep dive into the business models adopted by emerging leaders.

Role of NBFCs in India - Green Finance and Climate Risk Management

India's journey towards sustainable energy solutions has grown dramatically in recent years, propelled by ambitious renewable energy targets and a growing awareness of environmental stewardship. Solar energy, in particular, has emerged as a cornerstone of this transformation, harnessing India's abundant sunlight to power homes, businesses, and industries. As the nation strives to meet its renewable energy goals, the landscape of solar financing has evolved significantly.

NBFCs play a critical role in addressing India's climate finance needs by providing accessible funding, often faster than traditional banks. Though regulated by the Reserve Bank of India, they are more flexible and can bridge funding gaps, particularly for smaller or underserved businesses. Few NBFCs have emerged to finance sustainable projects such as green buildings, rooftop solar and electric vehicles, addressing the last-mile gap in climate funding. They are increasingly recognizing the immense potential in this sector. They offer tailored financial solutions that cater to the unique needs of small businesses and underserved communities. Their innovative approaches facilitate the adoption of solar power and foster financial inclusion, paving the way for a greener and more sustainable future for India.

While large players have made their mark, several smaller NBFCs are emerging as key contributors to this sector, offering innovative and accessible financing solutions. These companies are not only supporting the growth of solar energy projects but are also driving financial inclusion by enabling small businesses and underserved communities to adopt clean energy. For NBFCs, ESG measures are becoming crucial for establishing their financial health. By stressing social justice, environmental sustainability, and sound governance, NBFCs may manage risks, seize expansion opportunities, and help create a more sustainable future. NBFCs of India are progressively integrating ESG, aligning with national goals to reduce emissions by 45% by 2030 and achieve net zero by 2070. Key sectors like solar products and electric vehicles (EVs) are at the forefront of this transformation.

Facilitators of ESG-driven Growth - NBFCs play a significant role in India's economy by extending credit to underserved segments and reaching consumers in remote areas. They face several challenges, including reputational, compliance, human resource, and climate-related risks. Integrating ESG principles helps address these risks and creates value for stakeholders and society.

Exploring ESG Impact Through Green Financing - The advantages of ESG indicators have been shown in green financing. With the help of NBFC financing, green products are becoming

increasingly common in this industry. These initiatives show that ESG investments may be both ethical and profitable while improving the quality of life for locals and solving environmental issues.

Challenges - Even with advancements, NBFCs still have difficulties adopting ESG, such as low awareness, a requirement for capacity growth, and changing regulations. These obstacles present opportunities for innovation and partnership. Collaborations with international organizations, government departments, and fintech companies may accelerate the adoption of ESG and establish new benchmarks for sustainable finance. As the green finance business grows, it is important for NBFCs to deal with suitable laws and best practices. The Reserve Bank of India (RBI) has released rules for banks and NBFCs to accept green accounts. This system motivates financial institutions to provide green investments while ensuring that money is given to accepted green projects.

Key improvement opportunities for the NBFCs safety steps include:

- Financing strategy: NBFCs must design a board-approved financing strategy showing how profits from green deposits will be spread to qualified projects.
- Reporting and Disclosure: Regular reporting is needed to clarify the amount created via green payments and the particular projects supported.
- Third-Party Verification: Independent verification of grant allocation ensures that profits are utilised effectively for accepted green projects.
- Impact Assessment: While originally optional, impact studies will become needed from FY 2024-25, causing NBFCs to examine the environmental benefits of their funded projects.

Small Finance Bank (SFB) Role in India - Green Finance & Climate Risk

Analysis of Sustainability Report of a leading SFB FY 2023-24 - Highlights

Driven by its commitment to "Building Better Lives, sustainably" is dedicated to creating positive impact across multiple dimensions of the operations, ensuring sustainability is at the heart of everything they do. By prioritising sustainability, the SFB strives to foster lasting change and enhance lives, sustainably! This report represents organization's commitment to environmental stewardship, social responsibility and economic viability. As the SFB releases its second edition of the Sustainability Report, it aims to provide a comprehensive overview of sustainability initiatives and progress achieved in alignment with the strategy set in the previous financial year. It articulates the Bank's vision and approach to foster financial inclusion and promote responsible practices that benefit all the stakeholders.

- Key Highlights of the Year
- Reporting Boundaries
- Resilient Environment
- Social Wellbeing (Employee & Communities)
- Ethical Governance
- Economic Value Generated, Distributed and Retained
- Significant Indirect Economic Impacts
- ESG CREDENTIALS
- DATA PRIVACY AND CYBER SECURITY
- Creating Long-Term Value
- Stakeholder Engagement
- Materiality Assessment
- Materiality Matrix
- Material Issues for Enterprise Value Creation
- Material Issues for External Stakeholders
- ESG Strategy
- Nurturing Organisational Integrity & Resilience - Key Governance Performance Highlights

- Sustainability Governance Structure
- Sustainability-linked Policies - Environment
  - Sustainability Policy
- Social
  - Human Rights Policy
  - POSH Policy
  - CSR Policy
  - Occupational Health Safety Policy (Workplace)
  - Vigilance - Anti-Bribery and Anti-Corruption Policy
  - Grievance Redressal Policy
  - Customer Rights Policy
  - Whistleblower Policy
- Governance
  - Policy on Code of Conduct
  - Supplier Code of Conduct
  - Risk Governance Policy
  - Terms and Conditions of Appointment of Independent Directors
  - Nomination And Remuneration Policy
  - Code of Conduct for Insider Trading
  - Policy on Board Diversity
- Ethics and Compliance
- Climate Risk Management
- Stand on Task Force on Climate related Financial Disclosures (TCFD)
- Due Diligence
- Trainings on Risk Management
- Data Privacy

- Digital Transformation
- Fostering Environmental and Financial Stewardship
- Sustainable Operations
- Energy & Emission Management
- Usage of Green Chemicals
- Sustainable Infrastructure
- Circularity
- Waste Management
- Water Management
- Sustainable Supply Chain
- Supplier Code of Conduct (CoC)
- Responsible Finance
- Advancing Social Well-being
- Empowering Our Human Capital
- Diversity, Equity and Inclusion
- Building Sustainable Communities
- ESG Disclosures
- Mapping with GRI and Content Index
- SDG Alignment

Small Finance Bank (SFB) Role in India - Green Finance & Climate Risk

Analysis of Green Deposit Policy of a leading SFB FY (Sept 2023)–Highlights

1. Objective of the Policy
2. Definition of Green - The SFB defines those activities as Green that support Climate risk mitigation and adaptation. These activities include projects that mitigate greenhouse gas (GHG) emissions, energy efficiency improvement projects, green certified buildings, Generation and/or storage of energy from renewable energy sources, non-fossil-based mobility, sustainable water & waste management.
3. Green Deposits - Green Deposits means an interest-bearing deposit, received by the SFB for a fixed period and the proceeds of which are earmarked for being allocated towards green activities.
4. Implementation Mechanism - Use of proceeds, Process for project evaluation and selection, Management of proceeds, Third Party Verification/Assurance, Impact Assessment, Reporting and Disclosure, External Review of the framework
5. Commitments
    - Develop a Green Deposit framework.
    - Develop a matrix for Eligible 'green' activities and 'Use of proceeds'
    - Formulate a criterion for allocation of funds for 'Green lending' and 'Green deposits'
    - Third Party Impact assessment of projects facilitated through this route and relevant disclosure in line with guidelines of RBI
6. Disclosures

Net Zero Best Practices for Indian Banks and NBFCs Sector

Beyond a compliance exercise, banks and NBFCs can leverage this opportunity to develop a holistic climate strategy.

- Indian banks and Non-Banking Financial Companies (NBFCs), can help bridge the climate finance gap and ensure financial stability in a changing environment. India faces a considerable average annual investment need of USD 202 billion to achieve its net-zero greenhouse gas (GHG) emissions goal. As the largest available source of climate finance outside of government expenditure, India's banking sector has the potential to help address this financing gap.
- Regulators have implemented several initiatives to both support and nudge the sector to take action. Most recently, the Reserve Bank of India (RBI) released draft guidelines on climate-related disclosures for Regulated Entities (REs) in February 2024, highlighting the need to assess climate risks and plan for the transition.
- Though banks are taking action, the sector is still early in its efforts and faces structural bottlenecks. A significant number of Indian banks and NBFCs lack the preparedness to comply with RBI's draft disclosure framework and provide confidence to stakeholders in their future-readiness. Key barriers identified through consultations include: the limited availability of high-quality, climate-relevant data needed to evaluate climate risks and opportunities; challenges building the capabilities needed to inform and implement transition strategies and others.
- Banks and NBFCs can leverage integrated transition planning approaches to address barriers and meet evolving regulatory and stakeholder expectations. RBI's forthcoming climate disclosure framework presents a valuable opportunity for REs to demonstrate their commitment to climate action and enhance transparency for regulators, investors, and stakeholders. Beyond a compliance exercise, banks and NBFCs can leverage this opportunity to develop a holistic climate strategy.
- India will need significant financing to realise its net-zero target by 2070 and build climate resilience. India, the third-largest GHG emitter globally, has taken steps to decouple economic growth from emissions, but rising energy demand may double emissions by 2040. Mitigation efforts needed to achieve net zero will be significant and are estimated to cost USD 10.1 trillion through 2070 or USD 202 billion per year on average. Much of this investment will likely need to be front-loaded to build out critical infrastructure and invest in technology development, resulting in an immediate need for capital. In parallel, acute and chronic impacts of climate change are mounting. In 2021 alone, India is estimated to have faced an income loss of USD 159 billion as a result of such impacts. In

contrast, current estimates suggest that annual climate finance flows are close to USD 42 billion per annum, just 25% of what is needed to meet India's 2030 Nationally Determined Contributions (NDCs).

- Scheduled commercial banks, NBFCs, and other lending institutions will be critical to bridge this financing gap, giving them both an imperative for climate action and an opportunity to capitalise on green growth. India's banking sector, for example, is the largest available source of climate finance outside of government expenditure. Banks and NBFCs are also increasingly recognising their vulnerability to disruptions from physical and transition climate risks. In fact, climate risk emerged as the highest risk category in the RBI's 2024 Systemic Risk Survey of its REs. However, financing net zero is not just a "must-do" but also a significant opportunity for new business development. It will open up new sectors and clients for lenders and provide avenues for lenders to enhance their relationships with existing clients seeking to decarbonise and become climate resilient. The majority of banks in India, however, have yet to take necessary steps to align themselves with the climate transition.
- India's evolving regulatory environment for sustainable finance signals the need for banks and NBFCs to take an accelerated and holistic approach to the climate transition. The past few years have seen a series of regulations designed to improve transparency of corporate sustainability efforts (including climate) and incentivise greater action. The Securities Exchange Board of India (SEBI) introduced the Business Responsibility and Sustainability Reporting (BRSR) framework in 2021 and recently extended coverage to unlisted companies through the introduction of the BRSR Core in 2023. Adding to this momentum, RBI released its draft disclosure framework for climate-related risks in February 2024, building on its initial guidance over the course of 2022 and 2023 and International Sustainability Standards Board's (ISSB) efforts. Though not finalised, it recommends detailed disclosures on climate targets, relevant risks and opportunities, strategies and governance mechanisms for addressing the same, and performance against targets as a baseline, prompting REs to think holistically about their climate strategies. SEBI and RBI have also been actively developing a market for credible green financing products, with the former laying out guidelines for thematic debt issuances and funds in line with global best practices and RBI implementing its Framework for Acceptance of Green Deposits in 2023. Looking ahead, more is likely to come - for example, the development of a climate finance taxonomy, as mentioned in the 2024 Union Budget speech, holds the potential to have wide-reaching implications across fundraising, capital deployment, and disclosure.
- Banks and NBFCs can leverage integrated transition planning to help address climate change and related regulation. Transition planning and transition plans have been globally

recognised as a critical tool to address climate risks, capitalise on climate opportunities, and unlock green financing.16 Ultimately, integrated climate transition planning for banks can be understood as the comprehensive strategy development that a firm must pursue across business functions to ensure it can accelerate the deployment of transition capital and manage climate risk in a holistic way. It refers to a planning tool and strategic process that an organisation can undertake to support the low-carbon transition by setting out targets, actions, and resources.

- Examining the lessons learnt by global banks that are navigating regulatory developments and engaging in transition planning can be particularly useful for Indian banks and NBFCs. The experiences of global banks, when contextualised for the Indian market, can provide insights into the process of transition planning, helping address key questions and bottlenecks early in the process. Accordingly, this paper intends to leverage global experiences to provide guidance to banks and NBFCs engaging in transition planning to holistically address climate risks and opportunities and stay in line with RBI's ongoing initiatives.

Reserve Bank of India (RBI) Stressing the need for Regulated Entities to consider Creating a Common pool of Bankable Projects for Climate Related Finance

The Reserve Bank of India (RBI) is close to finalising disclosure norms for regulated entities to outline their climate risk management plan, and a guidance note for lenders to analyse climate scenarios and stress test for those risks, Governor Sanjay Malhotra said on Thursday.

Stressing the need for regulated entities to consider creating a common pool of bankable projects for climate related finance, Malhotra said: "One of the oft-cited constraints to adequate flow of climate related finance has been the lack of bankable projects… Thus, creation of a common pool of such bankable projects will have multi-fold benefits for the entire ecosystem."

"Regulated Entities with experience of such projects can contribute to the pool for the benefit of others, while also benefiting from such information shared by other Regulated Entities," he said.

Noting that the impact of climate change risks is not limited to the financial system alone but extends to the real economy, be it the corporates, MSMES or the agriculture sector, Malhotra said this calls for a cohesive co-ordination and harmonisation in approach, among financial sector regulators, regulated entities as well as various government agencies.

"Over the short-term, our goal is to be able to make a realistic estimation of the impact of climate related risks not just on individual institutions but also on the financial system as a whole," Malhotra said at a policy seminar on Climate Change Risks and Finance organised by RBI in New Delhi. "This would involve scenario analysis and stress testing exercises, using both bottom-up and top-down approaches," he said.

Apart from emphasising the need for collaboration on climate financing, the governor also urged financial sector players to develop suitable capacity and technical know-how to better appraise risks in financing projects that use green technologies. Arguing that technology and finance have a critical role in the transition towards a low-carbon economy, Malhotra said there is a need to build innovative solutions and capabilities in these areas.

"We propose to set up a dedicated "on Tap" cohort on climate change risks and sustainable finance under RBI's Regulatory Sandbox initiative. We are also planning to conduct a special "Greenathon" on climate change and related aspects," he said.

In February 2024, the RBI had issued draft guidelines on Disclosure Framework on Climate related financial risks for public comments. The draft norms said regulated entities should

detail the governance processes, controls and procedures used to identify, assess, manage, mitigate and monitor climate-related financial risks and opportunities.

Malhotra said that the RBI is now in the process of finalising the guidelines after receiving valuable feedback. In this context, he also said a guidance note on Climate Scenario Analysis and Stress Testing is also being developed for the regulated entities.

RBI's endeavour has been to play the role of a facilitator, including supporting capacity building and fostering a conducive regulatory framework for promoting green and sustainable finance, he pointed out.

RBI's willingness to facilitate green financing is also evident from the fact that it has issued the Framework on acceptance of Green Deposits with the objective of enabling banks to augment the flow of credit to green activities and projects, Malhotra noted. To promote green finance, funding to small renewable energy projects is now part of priority sector loans.

The RBI, he said, remains committed to continue adopting a constructive and consultative approach towards supporting the various initiatives undertaken towards management and mitigation of financial risks related to climate change.

"We will continue to work steadfastly to realise our vision to build a financial system that can not only withstand future climate shocks, but also actively contribute to India's journey towards a sustainable and resilient future," the governor said.

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"We will collaborate and coordinate with the government and other regulators to ensure that there is harmonisation and consistency in rules, regulations and our approach towards mitigating the impacts of climate change," he underlined.

How Banks are changing their Process and ESG Reporting Practices

The **eight key objectives of the Roadmap for Disclosures and Roadmap for Disclosures**-

- Transparency and Disclosures: Facilitate access to information and promote market discipline
- Risk Management and Supervision: Ensure ESG risks and factors are integrated into risk management protocol and supervision
- Prudential Treatment of Exposures: Identify areas for potential enhancements to better decipher environmental and social risks
- Stress-Testing: Perform climate risk stress testing to identify vulnerabilities and deficiencies
- Standards and Labels: Provide supporting definitions and methodologies for sustainable banking products
- Green washing: Identify and monitor green washing risks
- Supervisory Reporting: Integrate information on ESG risks
- ESG Risks and Sustainable Finance Monitoring: Monitor material ESG risks and developments in sustainable finance

Requirement of standardized ESG reporting reflects amplified demands from regulators and consumers within the financial sector to demonstrate sustainable practices that are relevant, tangible, and resonate with stakeholders.

According to insights from McKinsey, "consumers are holding banks to higher ESG standards as well - in 2019, about 14 percent of total client-driven revenues were controlled by consumers whose banking preferences were influenced by concern about purpose and sustainability."

It is undeniable that there is a growing need for banking institutions to evaluate, structure, and implement related processes and best practices. This will be critical to position themselves both in compliance with mandated regulations as well as to stay ahead of the curve competitively and garner positive reputational sentiment with their ESG initiatives.

The **disclosure requirements encompass four primary categories**:

- Carbon footprint assessment and evaluation of assets tied to climate change related transition and physical risks
- Counterparty support through transition to carbon neutrality and climate change adaptation
- Key performance indicators (KPIs) pertaining to sustainable finance metrics including Green Asset Ratio (GAR)
- Qualitative assessment of ESG considerations within a bank's governance, risk and operational framework

Snapshot of Climate Exposures

A set of robust reporting hold banking institutions accountable to proactively disclose climate-related risks and courses of action to mitigate them, exposures to green assets, and sustainability incorporation into risk management. The reporting framework extensively spans both qualitative and quantitative components e.g.:

- Qualitative information on Environmental, Social, and Governance Risks
- Exposure quality by sector metrics
- Sector exposures and maturity buckets
- Energy efficiency of collateralized property loans
- Alignment metrics
- Exposures to top carbon-intensive firms
- Climate change transition risk for trading portfolio
- Exposures to climate change physical risk
- Green Asset Ratio (GAR) Assets
- GAR KPI

Suggestable Disclosures

1. Qualitative Disclosures
   - ➢ Qualitative information on environmental, social and governance risks
   - ➢ Governance arrangements
   - ➢ Business model and strategy
   - ➢ Risk Management
2. Risk Disclosures - Climate Change Transition Risk
   - ➢ Information on exposures to sectors or assets that may highly contribute to climate change
   - ➢ Exposure to fossil fuel companies excluded from sustainable climate, benchmarks, and to other carbon-related sectors
3. Risk Disclosures - Climate Change Physical Risk
   - ➢ Risk exposures subject to extreme weather events
   - ➢ Assets subject to impact from chronic climate change events by sector and geography

4. Green Asset Ratio

   - Information on exposure towards Corporates and Retail financing company activities consistent with Paris Agreement goals that contribute substantially to climate change mitigation and adaptation, including information on transitional and enabling activities
   - Contributing to Climate Change Mitigation: Generation of renewable energy
   - Enabling Climate Change Mitigation: Manufacture of renewable energy technologies
   - Contributing to Climate Change Adaptation: Forestation
   - Enabling Climate Change Adaptation: Engineering activities for adaptation to climate change

5. Mitigating Actions

   - Actions that support counterparties in the transition to a carbon neutral economy
   - Building renovation loans that improve the energy efficiency of the building but do not meet the taxonomy screening criteria
   - Actions that support counterparties in the adaptation to climate change
   - Loans to build barriers against flooding, or water management mechanisms against droughts

India's Business Responsibility and Sustainability Reporting (BRSR) Framework

The Securities and Exchange Board in India (SEBI) developed the Business Responsibility and Sustainability Reporting (BRSR) to mandate Indian companies to provide quantifiable metrics on sustainability-related factors, such as respect for human rights or environmental protection.

Business Responsibility and Sustainability Reporting (BRSR) is an integrated reporting framework. Its purpose is to increase the level of reporting on environmental, social, and governance (ESG) performance. BRSR requires enterprises to report ESG performance indicators to ensure that they practise responsible business and achieve sustainable development.

The primary objectives of BRSR are:

- To encourage companies to adopt sustainable business practices and integrate ESG considerations into their operations.
- To encourage the comparability and quality of non-financial information disclosed in the reports.
- To ensure that Indian companies comply with the international standards and frameworks of sustainability reporting.
- To improve stakeholder engagement and establish trust by ensuring that comprehensive ESG disclosures are made.

The foundation for India's ESG regulatory framework was laid with the introduction of Business Responsibility Reporting (BRR) guidelines in 2009. The new BRSR, in effect since 2023, is more closely aligned with globally accepted reporting frameworks like the GRI and TCFD. It requires the top 1,000 listed companies in India to respond to 140 questions, divided into 98 essential indicators (mandatory) and 42 leadership indicators (voluntary).

Further, to encourage widespread adoption of sustainable practices, SEBI has called on all companies with a public listing to adopt BRSR reporting on a voluntary basis. This applies irrespective of the fact that they may not be on the list of the first 1000 by market capitalisation. Through engagement with BRSR reporting, companies can show their intent to act in a responsible manner, avoid non-compliance with regulatory requirements, and get an advantage over other competitors in terms of sustainability.

The BRSR framework is organised into three pivotal sections:

- General Disclosures: This segment provides a brief description of the company, what it provides, how it runs, the people behind it, and its compliance with the law.
- Management and Process Disclosures: This section focuses on the details of the company's

operations. It outlines the policies, procedures, and measures implemented in the conduct of ethical business and promotion of environmental responsibility.

- Principle-wise Performance Disclosures: In this section, businesses are required to report on how they have complied with the nine key principles outlined under the National Guidelines on Responsible Business Conduct (NGRBC). These principles cover a number of essential aspects such as ethical business conduct, product management, employee welfare, effective shareholder communication, human rights, environmental care and sustainability, advocacy in public policy, economic development, and customer value.

Here are the principle-wise performance disclosures under BRSR:

The disclosure requirements are grouped into nine core categories, based on the principles of the National Guidelines for Responsible Business Conduct introduced by SEBI:

1. Environmental protection: Key performance indicators cover electricity consumption, water usage and air emissions.
2. Human rights: Focus on human rights violations and minimum and fair wages.
3. Integrity: Performance indicators include anti-corruption, anti-bribery and conflicts of interest policies.
4. Employee well-being: Metrics focused on parental benefits, employee accessibility and the percentage of unionized workers.
5. Inclusive growth: Policies favouring vulnerable and marginalized groups.
6. Sustainable goods and services: Information on investments in social and environmental impacts.
7. Responsible consumer engagement: KPIs encompass handling consumer complaints and feedback, product recall procedures and cyber security and data privacy policies.
8. Stakeholder responsiveness: Describing engagement with vulnerable and marginalized groups.
9. Responsible public policy engagement: Listing trade and industry affiliations and detailing issues relating to anticompetitive conduct.

The BRSR report should be published as an integral part of a company's annual report, allowing for transparent disclosure of non-financial performance alongside the financial parameters.

BRSR Guidelines by SEBI

SEBI has given detailed guidelines for BRSR reporting, so that companies follow a systematised and uniform model of ESG disclosures. These guidelines align with global best practices and

promote transparency, comparability, and accountability, which include:

- Interoperability with other international sustainability reporting standards, such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB). By adopting elements from these popular frameworks, SEBI expects to ensure that Indian enterprises sustainability reporting complies with international standards and enables them to gain recognition and comparison on the international stage.
- Submitting both the Essential Indicators (mandatory) report and leadership Indicators (voluntary) report for each of the NGRBC principles. Fundamental Indicators encompass a vast number of ESG issues, such as environmental information, employee well-being, human rights, and community engagement. This indicators are used as a framework for companies to report on their performance on the critical sustainability aspects. Leadership indicators include more developed and extensive elements of sustainability, including the scope of greenhouse gas emissions, value chain assessments, and detailed energy and water usage.
- Providing numbers on environmental indicators including energy consumption, gasses that cause the greenhouse effect, water intake, and waste disposal. This comprehensive approach to environmental reporting enables people who are interested to assess the environmental effects of a business and also review efforts made to reduce negative consequences.
- Providing information on social aspects such as the health of the employees, diversity and inclusion policies, human rights, and community engagement. These disclosures provide information about a company's strategy to foster a positive social impact and ensure equal opportunities for all.
- It is to be noted that some disclosures may not be applicable to certain industries. In such cases, the enterprise can state that the relevant disclosure is not applicable and the reasons for the same.
- The enterprise is required to provide clear, complete and concise responses, along with the web-links to the relevant documents, if available. The information sought on complaints in the format are accompanied with a 'Remarks' column, where enterprises can explain reasons for pending complaints, if any and give a brief on the nature of the complaints, wherever required.
- In addition to the disclosures sought under the format, the enterprise may disclose any other relevant sustainability-related information at appropriate places.

Key Highlights of BRSR Reporting in the Indian Banking Sector

In the Indian banking sector, BRSR (Business Responsibility and Sustainability Reporting) highlights the need for banks to disclose their ESG (Environmental, Social, and Governance) performance, aiming for transparency and accountability in their operations and to align with the National Guidelines on Responsible Business Conduct (NGBRCs).

Key Highlights of BRSR Reporting in the Indian Banking Sector:

- Mandatory Reporting: The top 1000 listed companies, including banks, are mandated to disclose their ESG performance in a quantitative and standardized format.
- Focus on ESG: BRSR reporting aims to increase transparency and accountability regarding a company's non-financial performance, particularly in relation to sustainability.
- Alignment with NGBRCs: The BRSR framework is based on the nine principles of the National Guidelines on Responsible Business Conduct (NGBRCs).
- Essential and Leadership Indicators: Reporting under each principle is divided into essential and leadership indicators, with essential indicators being mandatory and leadership indicators being voluntary.
- Value Chain Disclosures: The framework includes disclosures related to ESG performance within the value chain, covering upstream and downstream partners.
- Assurance or Assessment: BRSR Core disclosures are subject to third-party assessment or assurance to enhance credibility and transparency.
- Green Credit Disclosure: A new leadership indicator under Principle 6 of BRSR is introduced to track Green Credits generated or procured by the listed entity and its top-10 value chain partners.

Suggestable Template - Qualitative information on Environmental risk

Row No	Qualitative information on Environmental risk
	Business strategy and processes
1	Adjustment of the institution's business strategy to integrate environmental factors and risks, taking into account the impact of environmental factors and risks on institution's business environment, business model, strategy and financial planning
2	Objectives, targets and limits to assess and address environmental risk in short-term, medium-term and long-term, and performance assessment against these objectives, targets and limits, including forward-looking information in the design of business strategy and processes
3	Current investment activities and (future) investment targets in sustainable economy and EU Taxonomy-aligned activities
4	Policies and procedures relating to direct and indirect engagement with new or existing customers on their strategies to mitigate and reduce environmentally harmful activities
	Governance
5	Responsibilities of the management body for setting the risk framework, supervising and managing the implementation of the objectives, strategy and policies in the context of environmental risk management relevant covering various transmission channels: such as physical, transition, and liability risks: (i) Physical transmission channel (acute physical effects and chronic physical effects) (ii) Transition transmission channel (iii) Liability transmission channel
6	Management body's integration of short-, medium- and long-term effects of environmental factors and risks in the risk appetite framework, organisational structure both within business lines and internal control functions
7	Integration of measures to manage environmental factors and risks in internal governance arrangements, including setting environmental risk-related objectives, targets and limits, the role of risk committees, the allocation of tasks and responsibilities, and the feedback loop from risk management to the management body covering relevant transmission channels: (i) Physical transmission channel (acute physical effects and chronic physical effects) (ii) Transition transmission channel (iii) Liability transmission channel

Row No	Qualitative information on Environmental risk
8	Lines of reporting and frequency of reporting relating to environmental risk
9	Alignment of the remuneration policy with institution's environmental risk-related objectives
	Risk management
10	Definitions, methodologies and international standards on which the disclosures on environmental risks are based
11	Processes to identify, measure and monitor activities and exposures (and collateral where applicable) sensitive to environmental risks, covering relevant transmission channels: (i) Physical transmission channel (acute physical effects and chronic physical effects) (ii) Transition transmission channel (iii) Liability transmission channel
12	Activities, commitments and exposures contributing to mitigate environmental risks, covering: (i) Physical transmission channel (acute physical effects and chronic physical effects) (ii) Transition transmission channel (iii) Liability transmission channel
14	Results and outcome of the risk tools implemented and the estimated impact of environmental risk on capital and liquidity risk profile
15	Data availability, quality and accuracy, and efforts to improve data status
16	Description of limits to environmental risks (as drivers of prudential risks) that are set, and triggering escalation and exclusion in the case of breaching these limits
17	Description of the link (transmission channels) between environmental risks with credit risk, liquidity risk, market risk and operational risk in the risk management framework

Suggestable Template - Qualitative information on Social risk

Row No	Qualitative information on Social risk
	Business strategy and processes
1	Adjustment of the institution's business strategy to integrate social factors and risks taken into account the impact of social risk on the institution's business environment, business model, strategy and financial planning
2	Objectives, targets and limits to assess and address social risk in short-term, medium-term and long-term, and performance assessment against these objectives, targets and limits, including forward-looking information in the design of business strategy and processes
3	Policies and procedures relating to direct and indirect engagement with new or existing customers on their strategies to mitigate and reduce socially harmful activities
	Governance
4	Responsibilities of the management body for setting the risk framework, supervising and managing the implementation of the objectives, strategy and policies in the context of social risk management covering counterparties' approaches to: (i) Activities towards the community and society (ii) Employee relationships and labour standards (iii) Customer protection and product responsibility (iv) Human rights
5	Integration of measures to manage social factors and risks in internal governance arrangements, including setting social risk-related objectives, targets and limits targets, the role of risk committees, the allocation of tasks and responsibilities, and the feedback loop from risk management to the management body
6	Lines of reporting and frequency of reporting relating to social risk
7	Alignment of the remuneration policy in line with institution's social risk-related objectives

Row No	Qualitative information on Social risk
	Risk management
8	Definitions, methodologies and international standards on which the disclosures related to social risk are based
9	Processes to identify and monitor activities and exposures sensitive to social risk, including description of the due diligence policies implemented by the institution to identify and assess risks related to social factors
10	Activities, commitments and assets contributing to mitigate social risk
11	Implementation of risk tools for identification and management of social risk
12	Description of setting limits to social risk and cases to trigger escalation and exclusion in the case of breaching these limits
13	Description of the link (transmission channels) between social risk with credit risk, liquidity risk, market risk and operational risk in the risk management framework

Suggestable Template - Qualitative information on Governance risk

Row No	**Qualitative information - Governance risk**
	Governance
1	Institution's integration in their governance arrangements governance performance of the counterparty, including committees of the highest governance body, committees responsible for decision-making on economic, environmental, and social topics
2	Institution's accounting of the counterparty's highest governance body's role in non-financial reporting
3	Institution's integration in governance arrangements of the governance performance of their counterparties including: (i) Ethical considerations (ii) Strategy and risk management (iii) Inclusiveness (iv) Transparency
4	Institution's identification and monitoring of any significant conflict of interest in the operations of the counterparty and the way the counterparty handles such cases
5	Institution's account for the counterparty's internal communication on critical concerns
	Risk management
6	Institution's integration in risk management arrangements the governance performance of their counterparties considering: (i) Ethical considerations (ii) Strategy and risk management (iii) Inclusiveness (iv) Transparency

Indian Banks Association (IBA) - National Voluntary Guidelines for Responsible Financing

The Indian Banks' Association (IBA) has released the "National Voluntary Guidelines for Responsible Financing," which provide broad principles for Financial Institutions (FIs) to integrate Environmental, Social, and Governance (ESG) risk management into their business strategies, decision-making, and operations.

What is Responsible Finance: Responsible Finance is all about good governance, strong emphasis on capital preservation and its quality, effective risk management, and proactive social and environmental intervention through investment and lending. All the four components are intrinsic to a financial institution's (FIs) business. Responsible Finance requires integrating Environmental, Social and Governance (ESG) risk management into an FI's business strategy, decision-making processes and operations. By doing so, an FI attains a stable balance between earnings and risks on the one hand, and on the other, the use of ESG parameters opens up new growth and investment opportunities. Responsible Finance provides a framework that taps the huge twin potential of the financial sector for its growth and development impact.

Guidelines for Responsible Financing: These are the financial sector specific guidelines that combine and adapt international and national good practice precedents. These are envisaged to cater to the sector's risks, opportunities and responsibilities. Pragmatic, suitable and consistent with the aspirational vision of the financial sector in India, government's development priorities and the well-being of the people, the National Voluntary Guidelines for Responsible Financing contain eight principles and five pillars of implementation. The guidelines are a voluntary instrument and go beyond compliance thus raising the bar of conduct. The Guidelines urge FIs to systematically adopt measures on all eight ESG principles. These measures thus do not induce any legal liabilities for the adopting organisation. The benefits accruing from the adoption of the guidelines include proactively building positive reputation through transparent communication with stakeholders. These principles are envisioned to drive the organisations to longevity and sustainable value creation. Each principle of the Guidelines serves to enhance the business case for the FI on one or more of the following parameters, namely, revenue growth and market access, brand value and reputation, cost savings, human capital, risk management and access to capital. Not to forget is the demand for increased capital by Indian FIs. They will essentially need to mobilise international institutional investors for whom FIs performance on ESG is becoming important. A commonly agreed National Guidelines for the financial sector will help fulfil that requirement in a standardised manner. The Guidelines also contain a detailed principle wise implementation guidance, which is summarised in a step-wise process here to translate the eight principles into concrete and measurable actions.

Action steps for adoption of Guidelines by the FI:

1. Financial Institutions should adopt these principles and implement them in various lines of business as per their strategic priorities with the objective of strengthening the risk management and growth strategy of the institution. While the principles of the Guidelines are indivisible and non-hierarchical, an FI is encouraged to develop a plan that phases its progress under each principle against appropriate time lines and indicators.
2. The Boards of an FI should integrate ESG oversight function in an appropriate sub-committee of the Board (e.g. Risk Committee) or create a new committee as deemed fit for mainstreaming these principles in FI's operations and its subsequent monitoring and review.
3. The committee with ESG responsibility should place the guidelines for adoption before the Board outlining the business case and advantages accruing to the institution in terms of:
    a) Effective board oversight on ESG footprint of FIs internal operations and ESG risks associated with asset portfolio and help in creation and preservation of long-term capital
    b) Focused environmental and social risk management to mitigate transaction related credit and reputational risks
    c) Useful tool and input data for credit rating exercise of portfolio
    d) Identifying new business opportunities aligned to E&S risk mitigation and adaptation (clean tech financing, energy efficiency, Agri-financing-logistics etc)
    e) Identifying demand among existing customers for products and services with social and environmental components
    f) Positive investor outlook and access to international finance/low-cost finance
    g) Transparency and disclosure measures which will facilitate better public relations/ customer relationship and good reputation
4. In general, an ESG Portfolio Risk Framework could follow the mentioned steps:
    a) Check new investment opportunity for activity on Exclusion List. If the opportunity confirms negative, then
    b) Initiate screening review of the industry sector, client and technical aspects of project on ESG parameters (Those applying and reporting on NVGs through BRR should be given preference)

c) Conduct due diligence based on ESG policy of the institution adhering to the eight principles of these Guidelines

d) Initiate gap assessment and deploy environmental and social action plan

e) Enter investment agreement

f) Monitor and review on an ongoing basis

g) Feed findings in the reporting process and disclose on an annual basis (at the least)

The National Voluntary Guidelines for Responsible Financing (NVGRF) take not only national but also global trends, developments and realities and suitably adapt them to raise the bar for financial institutions operating in India to deliver them competitive advantage as well as higher value to all stakeholders where long-term health and prosperity of society and the planet is central.

Structure: The Guidelines are not prescriptive in nature and lay out eight principles which cover different aspects of environmental, social and governance (ESG) responsibilities that should inform business action. Each Principle is elaborated through a brief 'Description and Applicability' (D&A)and 'Areas of Disclosure'. The detailed chapter on Implementation Guidance enables financial institutions to systematically integrate these principles in their business decision making, structures and processes.

Applicability: The Guidelines are amenable to adoption by financial institutions across all segments of the financial sector irrespective of their size and location. The eight principles contained in these guidelines are non-divisible and interlinked; and in order to function responsibly, a financial institution should adopt each of the eight principles instead of picking and choosing one over the other. The Guidelines also emphasise that financial institutions should encourage members in their value chain, partners, vendors, collaborators also adhere to the Principles in these Guidelines.

Approach: The National Voluntary Guidelines on Responsible Financing encourage financial institutions to take a sector-wide look and make the effort to collaborate and partner on knowledge sharing, taking stock of the progress achieved in imbibing and implementing ESG in the way of doing their core business and utilising this paradigm for their growth and impact. The Guidelines emphasise furtherance of public good and encourage financial institutions to engage, as much as possible collaboratively, in policy advocacy that is aligned with the spirit of these Guidelines. Additionally, the Guidelines envisage that while capacity building needs within financial institutions may vary, it will be essential to scale up awareness efforts, and training programmes for personnel across the sector to prepare them and mainstream the ESG way of doing business through greater cooperation and collaboration among financial institutions.

Process: The Guidelines formulation process finds its genesis in the Working Group formed under the convener-ship of the Indian Banks' Association (IBA). This was a culmination of long engagement and dialogue with financial institutions supported by the joint initiative undertaken by GIZ and SIDBI under the bilateral cooperation project on Responsible Enterprise Finance. The Working Group brought together a cross-section of public and private sector banks, think tanks and implementing agencies. A core group within the Working Group called the Guidelines Drafting Group was tasked with the formulation of the Guidelines for Responsible Financing, Implementation and Disclosure Framework, and develop a roll-out strategy. These Guidelines have been approved and passed by the IBA Management Committee for adoption by banks.

Indian Banks Association (IBA) - National Voluntary Guidelines for Responsible Financing: Principles

Principle 1: Ethical conduct and E&S Governance

Principle 2: Integration of E&S risk management in business activities

Principle 3: Minimizing environmental footprint in internal operations

Principle 4: Environment friendly products, services and investment

Principle 5: Enabling inclusive human and social development

Principle 6: Stakeholder engagement

Principle 7: Commitment to human rights

Principle 8: Disclosure

Five Pillars of a Responsible Finance Strategy:

Successful implementation of the principles contained in the guideline requires that all of them need to be integrated and embedded in the core business processes of the financial institution. A holistic Responsible Financing Strategy is ideally built on the following five pillars:

- Leadership
- Materiality
- Integration
- Engagement
- Disclosure and Reporting

Carbon Credit Mechanism

Carbon credit mechanism is a system where organizations can earn or purchase credits for reducing or removing greenhouse gas emissions, effectively offsetting their own emissions. This mechanism incentivizes emission reductions by creating a financial value for actions that lower the carbon footprint.

It generally works as following:

1) **Setting Emission Reduction Targets**:
   - Governments or regulatory bodies establish emission caps for specific industries or sectors.
   - Organizations exceeding their allocated emission allowances must purchase carbon credits to offset their excess emissions.
   - Organizations that reduce emissions below their allowance can sell their surplus credits.

2) **Generating Carbon Credits**:
   - Credits are generated through projects that demonstrate verifiable greenhouse gas (GHG) emission reductions, removals, or avoidance.
   - These projects can include renewable energy initiatives, energy efficiency improvements, or carbon capture and storage.
   - International bodies like the Verified Carbon Standard (VCS) or the Gold Standard often certify these projects.

3) **Trading Carbon Credits**:
   - Carbon credits are traded on established platforms, either within a compliance market (like the European Union Emissions Trading System) or through voluntary carbon markets.
   - This trading mechanism creates a financial incentive for businesses to reduce their emissions.

4) **Offsetting Emissions**:
   - Organizations can use carbon credits to offset their remaining emissions, working towards carbon neutrality.

- A carbon credit represents a reduction of one metric tonne of carbon dioxide or its equivalent in other greenhouse gases.
- This allows businesses to compensate for emissions they cannot eliminate through internal efforts.

5) Key Components of the Mechanism:

- **Compliance Mechanism:** Addresses emissions from sectors subject to regulatory limits.
- **Offset Mechanism:** Incentivizes voluntary emission reductions from entities not covered under compliance mechanisms.
- **MRV (Monitoring, Reporting, and Verification):** Ensures the accuracy and reliability of emission reductions through standardized processes.
- **Registries:** Maintain records of all issued and retired carbon credits.

In India:

- India is developing a national carbon market framework, including both compliance and offset mechanisms.
- The framework aims to encourage both mandatory emission reductions in key sectors and voluntary actions from other entities.

Sustainable Climate Risk Induced Business

Sustainable climate risk-induced business refers to the integration of climate risk considerations into business strategies and operations to build long-term resilience and sustainability. This involves identifying and mitigating potential risks from climate change, as well as capitalizing on opportunities that arise from a transition to a low-carbon economy.

Understanding Climate Risk: Climate risks are broadly categorized into two types:

- **Acute risks:**

  These are sudden, severe events like extreme weather (hurricanes, floods, wildfires) that can cause immediate damage to assets and disrupt operations.

- **Chronic risks:**

  These are long-term shifts in climate patterns (rising sea levels, droughts, temperature increases) that can degrade infrastructure, disrupt resource availability, and increase operational costs over time.

Climate Risks Impact on Businesses:

Climate risks can manifest in various ways, including:

- **Increased operating costs:**

  Disruptions to supply chains, rising energy costs, and increased insurance premiums can all contribute to higher operating expenses.

- **Damage to assets:**

  Extreme weather events can damage physical infrastructure, leading to costly repairs and downtime.

- **Disrupted supply chains:**

  Climate change can impact the availability of raw materials, leading to production delays and increased costs.

- **Reduced revenue:**

  Extreme weather events can impact consumer demand and disrupt business operations, leading to revenue losses.

- **Increased reputational risk:**

  Companies that fail to address climate change may face reputational damage and loss of consumer trust.

Strategies for Sustainable Climate Risk Management:

- **Climate Risk Assessment:**

  Conduct regular assessments to identify potential physical and transition risks, including impacts on assets, operations, and supply chains.

- **Setting Science-Based Targets:**

  Establish emission reduction targets aligned with scientific recommendations to contribute to global climate goals.

- **Investing in Climate-Resilient Infrastructure:**

  Upgrade facilities and adopt technologies that can withstand climate impacts.

- **Developing Climate Adaptation Strategies:**

  Implement measures to mitigate the impacts of climate change, such as diversifying supply chains and investing in water-efficient technologies.

- **Engaging Stakeholders:**

  Collaborate with suppliers, customers, and investors on climate initiatives to foster a culture of sustainability.

- **Integrating Sustainability into Decision-Making:**

  Incorporate climate risk considerations into investment decisions and operational planning.

- **Disclosing Climate-Related Financial Risks:**

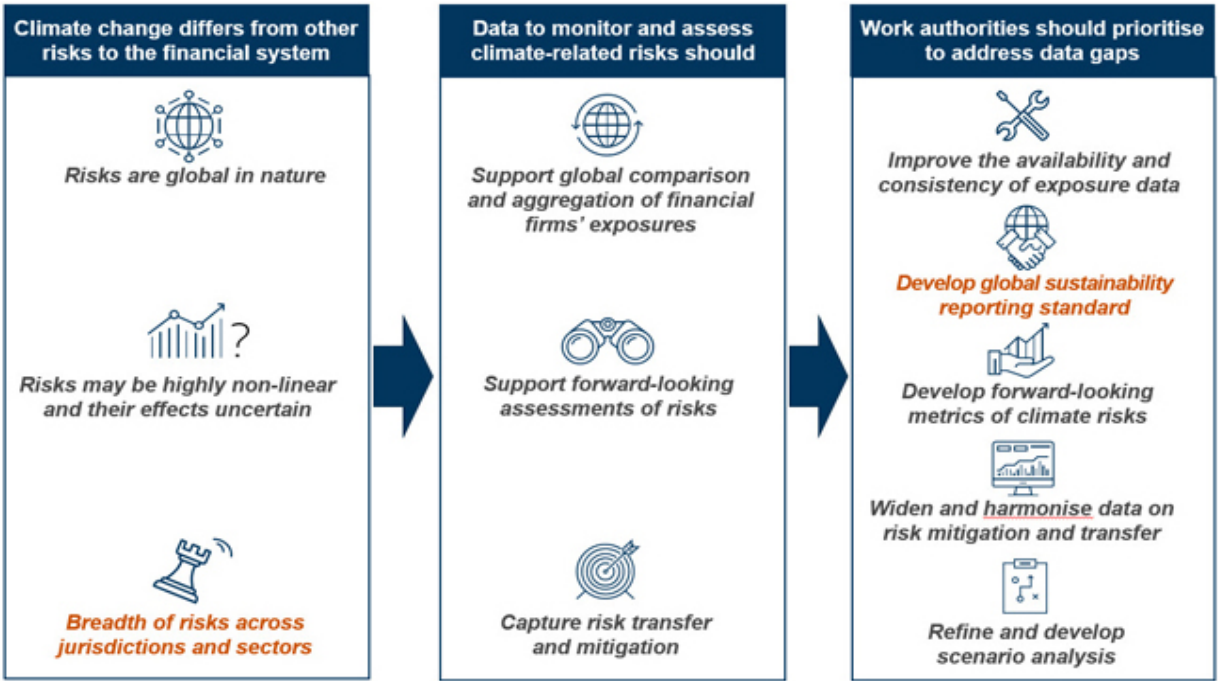
  Provide transparent reporting on climate risks and opportunities to meet stakeholder expectations.

Benefits of Sustainable Climate Risk Management:

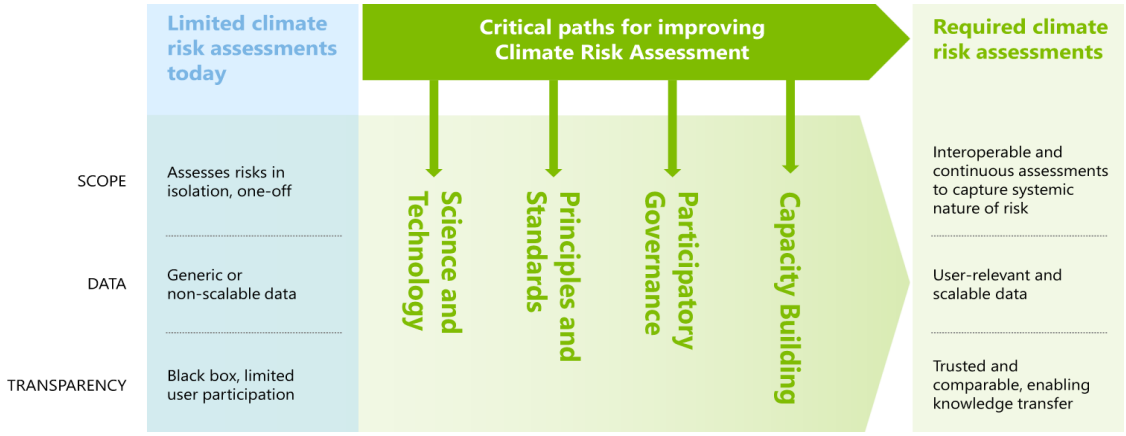
- **Reduced financial losses:** Proactive measures can minimize the financial impact of climate change.
- **Improved operational efficiency:** Sustainable practices can lead to cost savings and increased efficiency.
- **Enhanced reputation and brand value:** Companies that demonstrate climate leadership can build trust and attract environmentally conscious consumers.
- **Increased resilience:** Businesses can better withstand the impacts of climate change by building resilience into their operations.

Access to capital: Sustainable businesses may find it easier to secure funding from investors who prioritize environmental, social, and governance (ESG) factors.

https://www.c2es.org/content/climate-related-financial-disclosures/



https://www.fsb.org/work-of-the-fsb/financial-innovation-and-structural-change/climate-related-risks/



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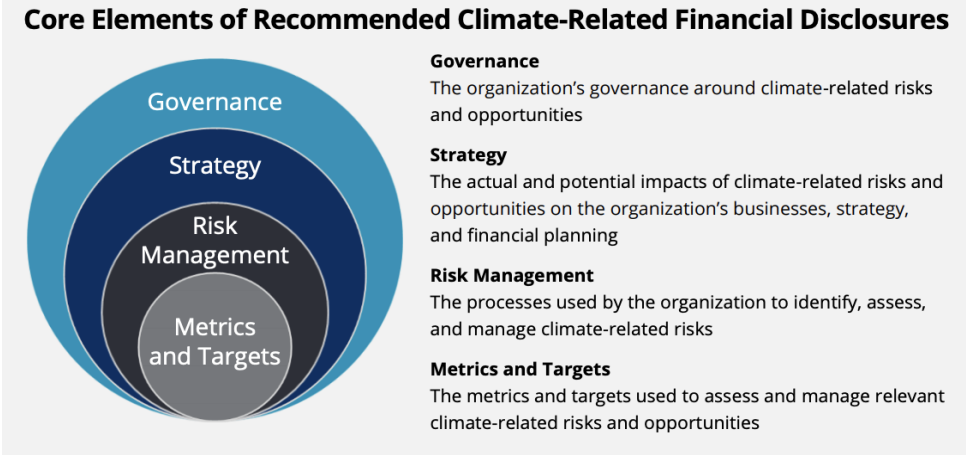
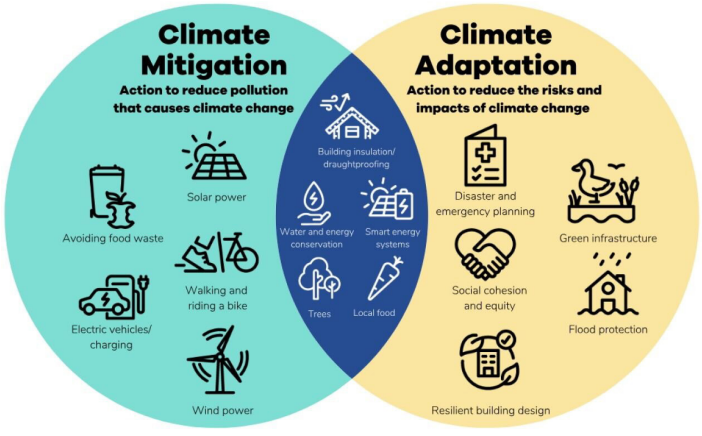
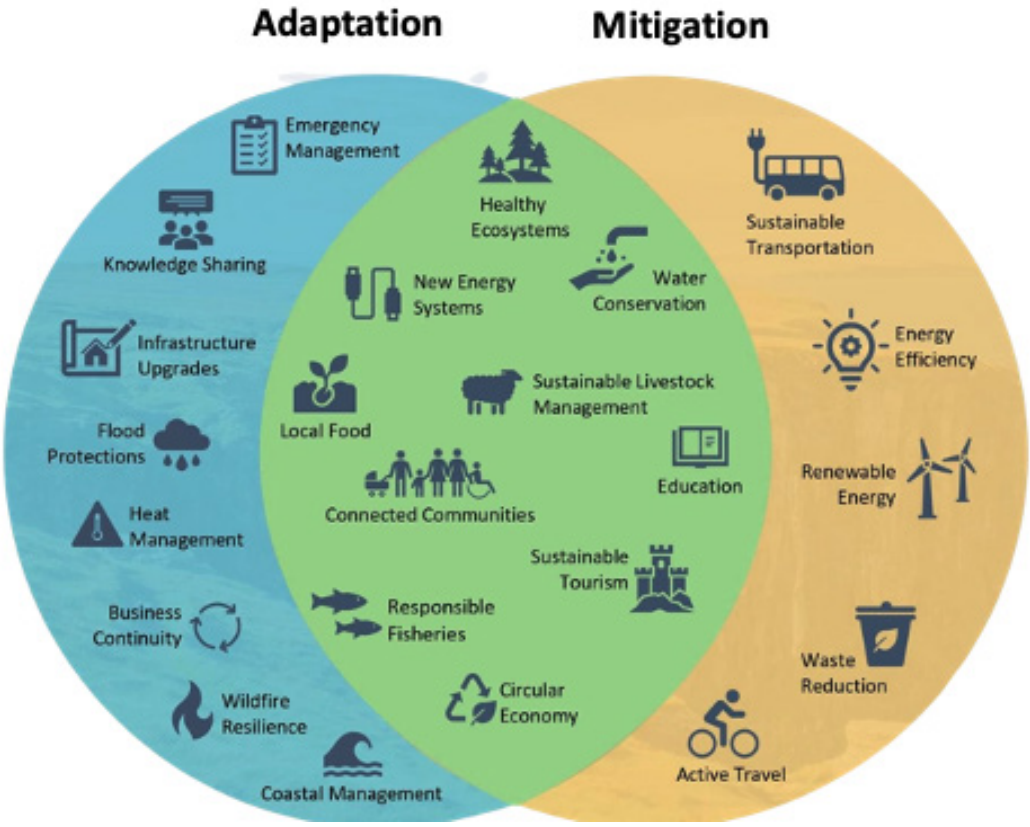


https://www.sinai.com/post/how-climate-management-risks-affect-investment-decisions



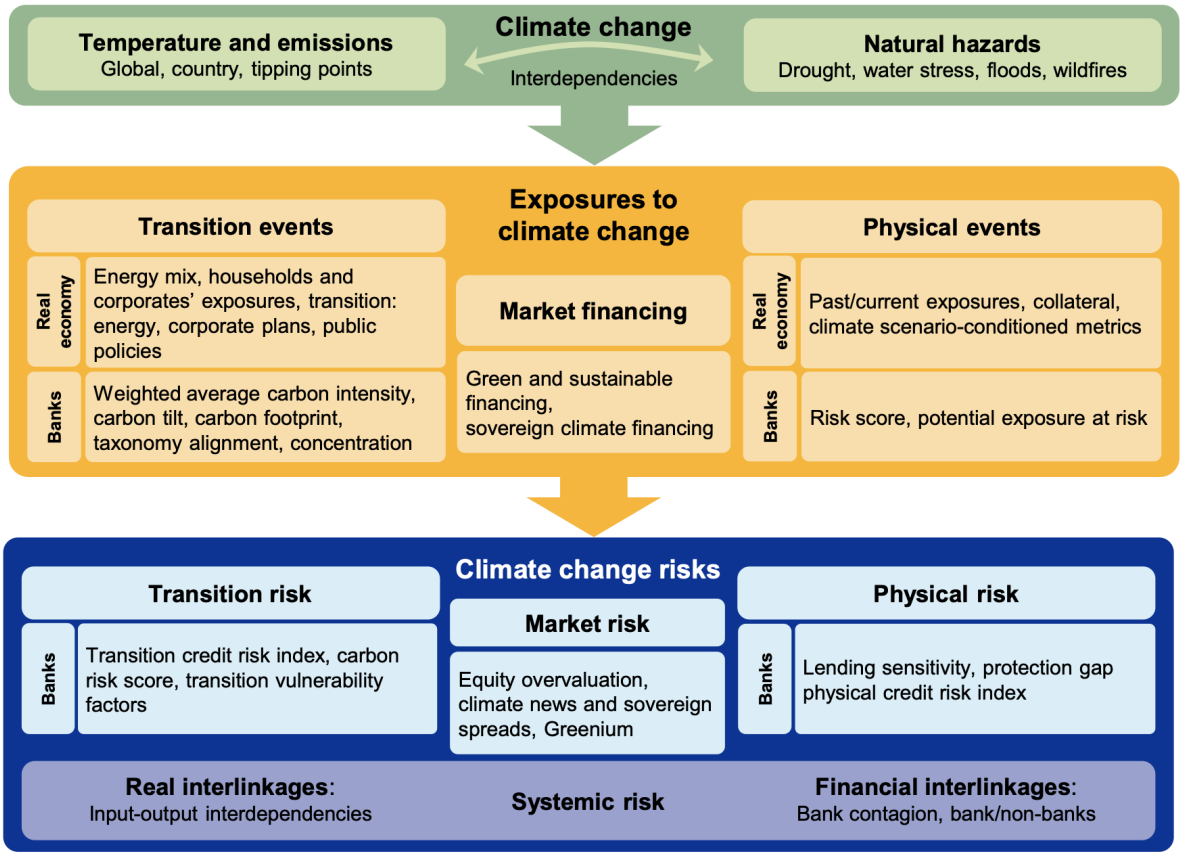
https://phys.org/news/2025-10-climate-key-piece-puzzle.html



https://www.etc-africa.co.za/blog/50-climate-change-understanding-the-difference-between-adaptation-and-mitigation

Type	Climate-Related Risks	Potential Financial Impacts
Transition Risks	**Policy and Legal**	
	– Increased pricing of GHG emissions – Enhanced emissions-reporting Obligations – Mandates on and regulation of existing products and services – Exposure to litigation	– Increased operating costs – Write-offs, asset impairment, and early retirement of existing assets due to policy changes – Increased costs and/or reduced demand for products and services resulting from fines and judgments
	Technology	
	– Substitution of existing products and services with lower emissions options – Unsuccessful investment in new technologies – Costs to transition to lower emissions technology	– Write-offs and early retirement of existing assets – Reduced demand for products and services – Research and development (R&D) expenditures in new and alternative technologies – Capital investments in technology development – Costs to adopt/deploy new practices and processes

https://www.researchgate.net/figure/Examples-of-Climate-Related-Risks-and-Potential-Financial-Impacts_tbl1_371340193



https://cepr.org/voxeu/columns/macroprudential-approach-managing-climate-risk

COP29 Outcomes - Country-specific climate finance obligations and Carbon market opportunity mapping

The UN Climate Change Conference (COP29) completed with a **new finance goal** to help countries to protect their people and economies against climate disasters, and share the vast benefits of the clean energy boom. With a central focus on climate finance, COP29 brought together nearly 200 countries in Baku, Azerbaijan, and reached a breakthrough agreement that will:

- Triple finance to developing countries, from the previous goal of USD 100 billion annually, to USD 300 billion annually by 2035.
- To scale up finance to developing countries, from public and private sources.

On climate finance perspective, multiple governments reached agreement on financing for developing countries, firstly a 'goal' of USD 300 billion by 2035 which represents a tripling of the last goal agreed on at the Copenhagen COP in 2009, and a second wider, 'aspiration' of USD 1.3 trillion to be mobilized by 2035. It is not clear how these sums will be raised and who will deliver the finance, which may prove problematic.

Lack of Country-Specific Mandates: Surprisingly, COP29 did not establish country-specific obligations for finance, which disappointed many developing nations, such as India, who argued for a more concrete and justice-based framework.

Focus on Private Finance: The target relies on a wider base of public and private finance providers, a shift from the historical reliance on a few developed countries, but this raises concerns about accountability and how such large sums will be mobilized.

Country-specific climate finance obligations are outlined in agreements like the Paris Agreement, which mandates that developed countries provide financial resources to developing nations for mitigation and adaptation. While there is no explicit list of obligations for every country, these obligations are often structured around the concept of Nationally Determined Contributions (NDCs) and the New Collective Quantified Goal (NCQG). Developed countries have a stronger responsibility to make these contributions.

Key Aspects of Country-Specific Obligations:

Developed Countries (Annex II): The primary obligation is on developed countries to provide financial resources. These are expected to lead the mobilization of funds from diverse sources.

Developing Countries: Their obligation is to use these funds to meet their climate action plans (NDCs) and achieve low-emission development and greater climate resilience.

NCQG (New Collective Quantified Goal): At COP29 in 2024, a global goal was set to mobilize $300 billion per year by 2035 for developing countries, setting a significant milestone for future financial flows.

Carbon markets

Carbon markets are witnessing significant growth, driving increasing global climate ambition and the recognition of carbon markets as a powerful tool to incentivize emissions reductions.

In 2023 and 2024 the market encountered a period of temporary stagnation as markets were adjusting to new regulations, integrity concerns, and economic conditions. Despite these fluctuations, the long-term outlook looks promising, with predictions indicating that the annual market valuation is set to reach a trillion dollars by the year 2050.

The growth trajectory of the market has been influenced by different factors, including the growing number of countries implementing carbon pricing mechanisms and the rise in demand from corporations to offset their emissions and finance climate action. However, the market is facing significant challenges related to climate concerns over carbon credit integrity and the need for more robust monitoring, reporting, and verification (MRV) systems.

Carbon markets are being perceived as a strategic imperative to the growing concerns over climate change and the need for effective mechanisms to reduce greenhouse gas (GHG) emissions. The purpose of carbon markets is:

- to create economic incentives that encourage industries in order to reduce emissions by placing a financial cost on carbon
- to attract investments in low-carbon technologies and carbon capture solutions.

Buyers of carbon credits are companies or individuals that produce greenhouse gas (GHG) emissions and seek to neutralize their environmental impact. Sellers of carbon credits are companies or projects that enforce GHG-reducing or carbon-sequestering solutions, including renewable energy installations, carbon capture and storage (CCS) technology, and nature-based projects such as reforestation, afforestation, and sustainable land management.

The future of the carbon market is further being shaped by a mix of regulatory developments, technological advancements, and evolving market dynamics:

Increasing Regulation - Governments and international organizations are introducing strict regulations and guidance to ensure the underlying environmental and social integrity of carbon credits. This includes enhanced quality standards for increased disclosure requirements, project methodologies, and published guidelines to use carbon credits responsibly. Key developments include the US and UK's guiding principles for high-integrity carbon markets and the EU's Green Claims Directive.

Market Convergence - The global footprint of carbon markets is ever-increasing across international and national spaces. While these developments improve market complexity, they offer opportunities to leverage and adapt existing frameworks. Navigating this complex landscape demands a deep

understanding of the specific markets and their requirements. Over the long run, shared learnings across these markets will offer opportunities for market convergence and shared standards.

Carbon Credits as an Asset Class - Carbon credits are growing into a recognized asset class, drawing in institutional investors, financial institutions, and insurance providers. Over the longer term, the improved participation from established industries and the legal recognition of carbon credits as an asset will lead to a more mature market. Mature markets will bring greater transparency and price discovery.

Digitalization - Digital technologies are set to revolutionize the carbon market, streamlining project development and sales processes. Blockchain technology presents the potential to enhance the security, transparency, and traceability of carbon credits.

Indian Regulatory Updates - RBI Green Deposit Verification: Mandatory third-party certification

The Reserve Bank of India's Green Deposit framework, effective June 1, 2023, establishes a regulated ecosystem for banks to mobilize funds for green projects, such as renewable energy and sustainable water management. These interest-bearing fixed-term deposits ensure proceeds are allocated to "eligible green projects" defined by an Indian green taxonomy. The framework mandates financial due diligence and annual audits for compliance, with the goal of promoting sustainable financial practices and increasing investment in climate-friendly initiatives.

Key Aspects of the Framework

Purpose: To channel financial resources towards green initiatives and projects, thereby fostering green finance and sustainability in India's financial sector.

Eligible Green Projects: These include activities and projects aligned with the Indian green taxonomy, focusing on areas like renewable energy, sustainable water management, energy efficiency, waste management, and green buildings.

Use of Proceeds: Deposited funds must be used for lending to and/or investing in eligible green activities.

Accountability & Compliance: Regulated Entities (banks) are required to perform financial due diligence, implement an external reviewer for their financing framework, conduct annual audits for compliance, and maintain internal controls for project evaluation and reporting.

Depositor Protection: Green deposits are covered under the Deposit Insurance and Credit Guarantee Corporation (DICGC).

Applicability: The framework applies to Regulated Entities (REs) such as banks and other financial institutions that offer deposits.

Interim Measure: Pending the finalization of the official Indian green taxonomy, banks can use the provided list of eligible green activities as an interim guide.

How it Works

Deposit Mobilization: Banks offer "green deposits" to customers, who then provide funds for a fixed period.

Fund Allocation: The proceeds from these deposits are earmarked for specific green projects and activities, as defined by the framework.

Due Diligence and Auditing: Banks conduct thorough checks on the projects and undergo annual audits to ensure the funds are used appropriately and compliantly.

Reporting: Banks must report on the allocation of these funds, promoting transparency in green finance.

Third-party verification and impact assessment of Green Deposit allocations by banks and deposit-taking NBFCs - Key aspects

Mandatory Annual Verification: Regulated Entities (REs) must conduct this independent verification of their green deposit allocations on an annual basis.

Independent Third Party: The verification must be performed by a qualified and reputed third-party entity.

Annual Impact Assessment: In addition to allocation verification, an annual impact assessment of the funds allocated to green activities/projects is also required.

Scope of Verification: The report should cover the use of proceeds, ensuring they are allocated according to the eligible green activities and projects listed in the framework.

Disclosure: The report from the third-party verification and the impact assessment must be made available on the RE's website.

Purpose of the Third-Party Verification:

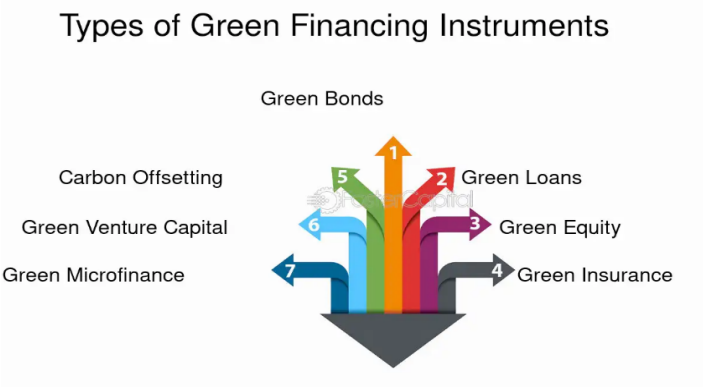
Combating Greenwashing

Ensuring Compliance

Building Investor Confidence

Mandatory Status

Emerging Climate Finance Instruments - Green Financing Instruments

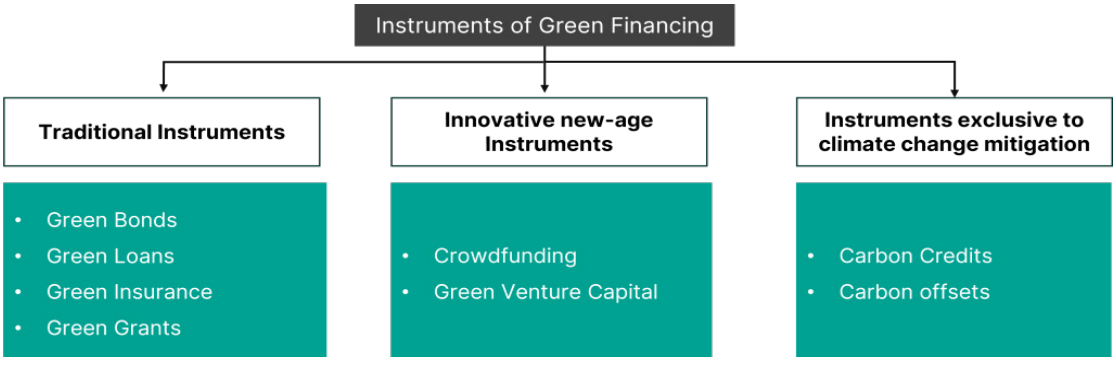


https://fastercapital.com/topics/green-financing-and-microfinance.html/1

Green Financing refers to financial products and services that support environmentally sustainable projects and initiatives. Green Financing refers to financial products and services that support environmentally sustainable projects and initiatives. These projects span a wide range of sectors - alternative energy, conservation of biodiversity, water, sanitation and hygiene, and waste management. Green financing aims to provide financial resources to businesses, governments and individuals to promote sustainability and reduce their negative environmental impact. Financial innovations can play a crucial role in enabling the transfer to a low-carbon and resource efficient economy by allowing investments in projects that aim to increase resource efficiency, reduce GHG emissions and support the development of alternative energy sources- nuclear, solar and hydro. Green Finance also offers the potential to create new jobs.

Green Financing Instruments

Green Finance instruments can be developed by tweaking existing financial instruments to service environmental preservation. Popular instruments try to attract investments by offering a positive (fiscal) return on investment; a valuable promise that justifies investment from a business point of view.



https://neufin.co/blog/green-financing-instruments/

Green Bonds: A green bond refers to debt security issued by an organisation or the government to raise funds from investors exclusively for projects that have positive environmental or climate benefits. They help mobilise capital from a range of investors, including institutional investors, retail investors and impact investors. Green bonds can back the transition to a low carbon economy by providing funding for renewable energy projects, energy efficiency improvements and other climate-friendly investments.

Green Loans: A green loan helps individuals, businesses and governments secure the necessary funding to finance environmentally sustainable projects and enterprises. Green loans can be a lucrative source of finance for both businesses and households. The interest rates on green loans are often more generous than on traditional loans.

Green Venture Capital (VC): Green VC can finance projects and companies that are developing sustainable technologies to ensure environmental conservation and battle climate change. It can provide sectors such as energy, waste and mobility much needed access to finance to develop cleaner technologies. Technology based green startups can often find it difficult to secure funding from traditional sources given the high risk on investment, VC funding can help offset these risks.

Green Grants: Green grants are aimed at empowering communities and businesses to implement projects that allow them to mitigate (or adapt to) climate change, manage their local natural resources and innovate ways to preserve the natural environment. Green grants are offered by governments, philanthropic organisations, private foundations and green NGOs that promote sustainable development. Green grants can also be extended to research facilities and universities to fund research work on climate change and sustainable development. They can help close the funding gap for financially unprofitable projects i.e. projects on which there is no financial return on investment.

Green Insurance: Green insurance attempts to incentivise sustainable consumption and production by offering lower premiums to green businesses and purchases. Globally financial institutions are increasingly giving priority to sustainability linked insurances post the release of the Principles for Sustainable Insurance manual by the UNEPFI which delineates how insurance companies must contribute to the sustainable development agenda by helping green project insurers quantify risks and thereby mitigate climate risks better.

Carbon Markets: At the Glasgow COP26 Climate Change Summit in 2021, participating nations agreed to set up a global trading market for carbon credits. One carbon credit allows a company to emit up to one tonne of carbon dioxide in the atmosphere. Polluting companies are awarded credits that allow them to pollute up to a certain level (cap), and the credits offered are reduced every year, nudging businesses to turn climate friendly.

Biodiversity Credits

In 2022, the World Economic Forum launched an initiative to explore the potential of biodiversity credits to unlock new financing for measurable positive outcomes for nature and its stewards.

Since then, the Initiative has been building the business case for the development of nature markets like biodiversity credits, bringing forth integrity both in project development and the supply of credits, and also across demand and related claims.

Biodiversity credits are a verifiable, quantifiable and tradeable financial instrument that rewards positive nature and biodiversity outcomes (e.g. species, ecosystems and natural habitats) through the creation and sale of either land or ocean-based biodiversity units over a fixed period.

The Nature Markets and Biodiversity Credits Initiative convene leading organizations from civil society, biodiversity conservation, standard-setting, project development, business, finance, and academia.

It also collaborates with other initiatives in the biodiversity credits space, including the UN-backed Biodiversity Credits Alliance and the International Advisory Panel on Biodiversity Credits.

Through a collaborative approach, the initiative focuses on three priority areas:

Exploring demand and supply dynamics - Identifying the drivers and incentives of demand, providing guidance around the risks and options of claiming the credits, and mobilizing a community of early movers to test the readiness of the market.

Promoting integrity and governance - Developing high-integrity and governance principles to promote transparency and inform robust methodologies to secure long-term benefits of the market.

Identifying metrics and measurement - Advancing the discussions on a standardized set of metrics, connected to existing reporting frameworks, to provide a consolidated approach and value in the context of a biodiversity credits market.

Debt-for-Nature Swaps

Debt-for-nature swaps have been around for decades. In essence, they are a financial instrument that allows countries to free up fiscal resources to build resilience against the climate crisis, and take action to protect nature while still being able to focus on other development priorities without triggering a fiscal crisis.

As the IMF's Managing Director, Kristalina Georgieva says: "Creditors provide debt relief in return for a government commitment to, say, decarbonize the economy, invest in climate-resilient infrastructure, or protect biodiverse forests or reefs."

Debt-for-nature swaps are viewed by many as a win-win where the country reduces its external debt while benefiting nature and environmental groups involved in the deal, and banks profit from selling on the debt.

Sustainability Key Risk Indicators

Category	Indicator subcategory
Environmental	Emissions footprint indicators
Environmental	Exposures to extreme weather conditions
Environmental	Fossil fuel energy consumption (oil, coal, gas)
Environmental	Renewable electricity (wind, solar, hydro), other sources
Environmental	Environmental taxes and subsidies
Environmental	Energy-efficiency indicators
Environmental	Losses due to extreme weather events
Environmental	Energy prices
Environmental	Environmental-related labels for real estate
Environmental	Propensity of extreme weather conditions
Environmental	Green public investment, fiscal expenditures (including Public Private Partnerships)
Environmental	Indicators related to supply chains or climate-related risks
Environmental	Insured and uninsured losses related to natural catastrophes
Environmental	Indicators related to chronic physical risks such as increasing temperatures, sea-level rises, water stress, biodiversity loss and resource scarcity
Environmental	Indicators related to circular economy, including waste prevention, re-use and recycling
Environmental	Emissions Trading Scheme allowances
Environmental	Indicators related to water management / consumption
Environmental	Insurance and re-insurance prices (i.e. premium)
Environmental	Household expectations about climate change and how it affects financial decisions
Environmental	Historical private and public aid provided after natural catastrophes
Environmental	Indicators of climate-related risks / environmental performance of suppliers
Environmental	Indicators related to biodiversity
Environmental	Insurance coverage levels (ie. insurance gap)
Environmental	Indicators capturing technological innovation, including patents on green technology
Environmental	Other indicators related to transition risk
Environmental	Indicators related to deforestation / reforestation
Environmental	Loan exposures to carbon-intensive industries
Environmental	Register of ecologically unsustainable companies
ForwardLooking	Climate targets for companies (how many companies in portfolio or what ratio of total investments have adopted a climate target)
ForwardLooking	Climate targets related to GHG emissions, water usage, energy usage, etc.
ForwardLooking	Climate targets of countries (e.g. climate neutrality by 2050)
ForwardLooking	Indicators reflecting transformation and enabling efforts
ForwardLooking	Companies' scenario analysis key aspects

Category	Indicator subcategory
ForwardLooking	Specific measures over the next 15 years and intermediate targets (e.g. reduce emissions per ton of steel by X% by 2030)
ForwardLooking	Climate VaR
ForwardLooking	Forward-looking climate scenarios
ForwardLooking	Action plan to promote women's participation and advancement in the workplace
Governance	Adequate management control
Governance	Quality and transparency of financial communication and reporting
Governance	Diversity of board members in terms of age, gender, educational and professional backgrounds
Governance	Transparency of compensations of executives, employers and employees
Governance	Percentage of independent board members
Governance	Inclusion of ESG objectives in the policy of the company
Governance	Executives' involvement in ESG issues
Governance	Training of employees and executives on ESG matters
Governance	Variable compensation of executives integrating ESG criteria
Governance	Dependence on the company on a managing director
Governance	CEO and board duality / size
Governance	Stock ownership by board and management
Social	Diversity issues, such as gender diversity and equal treatment in employment and occupation (including age, gender, sexual orientation, religion, disability, ethnic origin etc.)
Social	Quantitative and socio-demographic indicators on household over-indebtedness
Social	Microcredit indicators such as number of microcredits;
Social	Labour practices, including child labour and forced labour, precarious work, wages, unsafe working conditions
Social	Employment issues, including employee consultation and/or participation, employment and working conditions
Social	Health-related indicators (eg. Expenditure, death rate, no. of hospital beds)
Social	Banking fees indicators (such as number of persons benefiting from limitations on banking fees);
Social	Banking inclusion indicators (e.g. women's, youths', low-incomers' banking rates)
Social	Human capital indicators (eg. Training expenses budget for employees, scheme for assessing employees qualification and skills)
Social	Community relations, including social and economic development of local communities
Social	Existence of a collective bargaining agreement and trade union relationships
Social	Indicators related to the supply chain (such as monitoring suppliers on: labour practices, working conditions, respect of human rights, etc.)
Social	Government expenditure on education, total (% of GDP)
Social	Implementation of fundamental conventions of the International Labour Organisation

Category	Indicator subcategory
Social	Consumer relations, including consumer satisfaction, accessibility, products with possible effects on consumers' health and safety
Social	Policy of sharing results with the company's employees (incentive schemes, profit-sharing, employee shareholding, etc.)
Social	Responsible marketing and research
Social	Percentage of salaried administrators
Social	Funding of non-profit solidarity companies (integration activities related to employment, social and housing, international solidarity and the environment)
Sustainability	ESG ratings
Sustainability	Green / Sustainable bond holdings and issuance
Sustainability	Green / Sustainable lending
Sustainability	Labelled financial products (such as investment funds with a private or public label) holdings and issuance
Sustainability	Exclusion of controversial sectors in the investment/ lending policy (e.g. Nuclear, coal, weapons, tobacco, alcohol.)
Sustainability	Green / Sustainable stock / Bonds market indices (composition and holdings)
Sustainability	Consumer preferences for sustainable products / services
Sustainability	Various global reporting frameworks (and the relevant metrics) used by corporates in their non-financial reporting
Sustainability	Independent green bonds verifier

Bank - ESG Data Pack

Sustainable finance and investment ambition					
Sustainable Finance and Investment - Summary	Year				
	2023	2022	2021	2020	Cumulative
Capital Markets/Advisory (facilitated)					
Balance Sheet Related Transactions - Total[1]					
Lending Transactions[2]					
Guarantee Transactions[2]					
Investments (net new flows)[8]					
Total Contribution[3,9]					
Liabilities Transactions (deposits/issuances)[1]					

Sustainable Finance and Investment - Product View	Year				
	2023	2022	2021	2020	Cumulative
Green Bonds					
Social Bonds					
Sustainability Bonds					
Transition Bonds					
Sustainability Linked Bonds					
Short Term Debt					
ECM					
Green Loan					
Other Green Qualified Lending					
Green Company					
Social Loans					
Social Qualified Lending					
Sustainability Linked Loans					
Green Trade Loan					
Sustainable Trade Instrument					
Sustainable Supply Chain Finance					
Finance Advisory					
Project Finance					
Sustainable Finance					
Investment - ESG Assessed					
Investment - Thematic					
Investment - Impact					
ESG and Sustainable Investing[8]					
Total Contribution[3,9]					
Green Liabilities (linked to green assets above)[1]					
Green Deposits					
Structured Green Bonds					

Sustainable Finance and Investment - Classification by Theme View	Year				
	2023	2022	2021	2020	Cumulative
	$bn	$bn	$bn	$bn	$bn
Green - Use of Proceeds[4]					
Green Capital Markets/Advisory					
Green lending					
Social - Use of Proceeds[5]					
Social Capital Markets/Advisory					
Social lending					
Sustainable - Use of Proceeds[6]					
Sustainable Capital Markets/Advisory					
Sustainable lending					
Sustainability Linked[7]					
Sustainability Linked Capital Markets/Advisory					
Sustainability Linked lending					
ESG and Sustainable Investing - Net new flows[8]					
Investments					
Total Contribution[3,9]					

	Year			
	2023	2022	2021	2020
Sustainable Finance and Investment - Global Business View	**$bn**	$bn	$bn	$bn
WPB				
CMB				
GBM				
Total				

	Year			
Assets under management (AUM)	**2023**	2022	2021	2020
	$bn	$bn	$bn	$bn
Sustainable AUM				

Climate risk metrics - Wholesale Credit Risk	2023						
	Units	Automotive Chemicals	Construction and building materials	Metals and mining	Oil and gas	Power and Utilities	Total
Exposure to sector[1, 2, 3, 4]	$bn						
Sector weight as a proportion of high transition risk sectors	%						

Climate risk metrics - Retail Credit Risk

	Year									
	2023				2022				2021	
	By value		By volume		By value		By volume		By volume	
Flood risk for UK retail banking residential mortgage portfolio [1,3,4] by Region (Q3 2023)	% of regional lending at high risk	% of regional lending at very high risk	% of regional lending at high risk	% of regional lending at very high risk	% of regional lending at high risk	% of regional lending at very high risk	% of regional lending at high risk	% of regional lending at very high risk	% of regional lending at high risk	% of regional lending at very high risk

Exposure of our buildings to storm

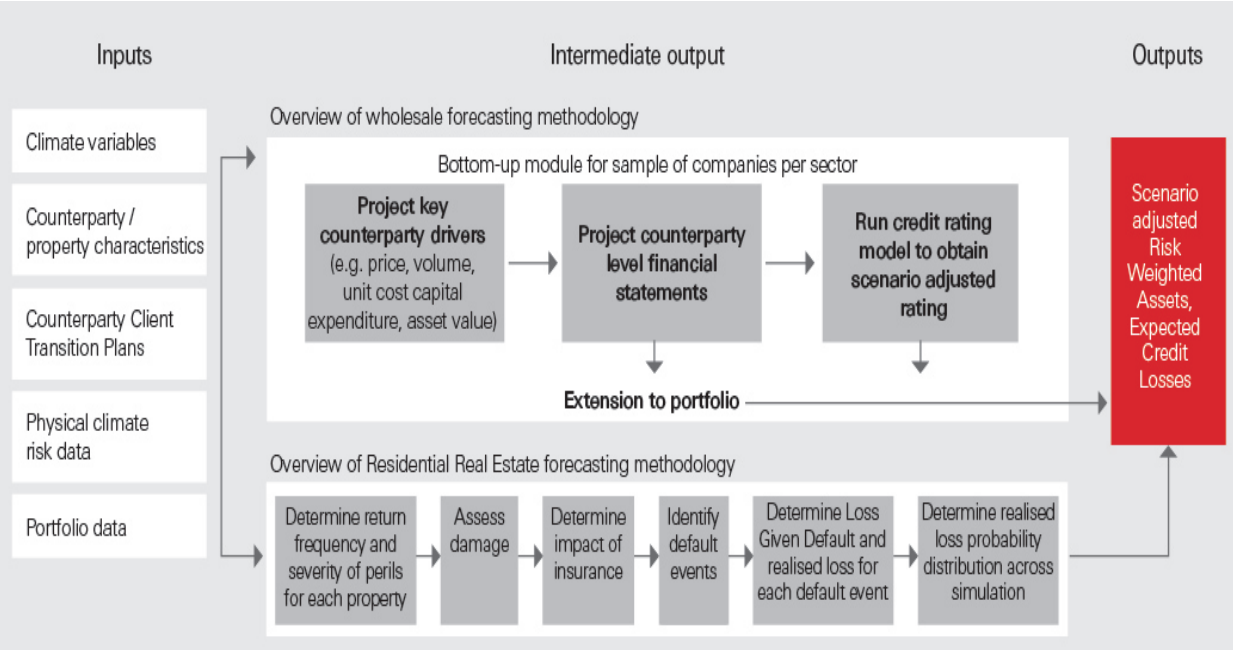
Number of Storm[1]	Properties at Risk 2023[2]				
	Office	Branch	Data Centres	Buildings Affected [3]	Business Impact
					Minor business impact
Number of Storm[1]	Properties at Risk 2022[2]			Buildings Affected [3]	Business Impact
	Office	Branch	Data Centres		
					No business impact

	Units	Year[2]					
Land use and ecological sensitivity[1]		**2023**	**% of Total portfolio[3]**	2022	% of Total portfolio[3]	2021	% of Total portfolio[3]
Number of sites owned, leased or managed in or adjacent to protected areas and/or key biodiversity areas (KBA)	number of properties [3]						
Area of sites owned, leased or managed in or adjacent to protected areas and/or key biodiversity areas (KBA)	square mts [4]						

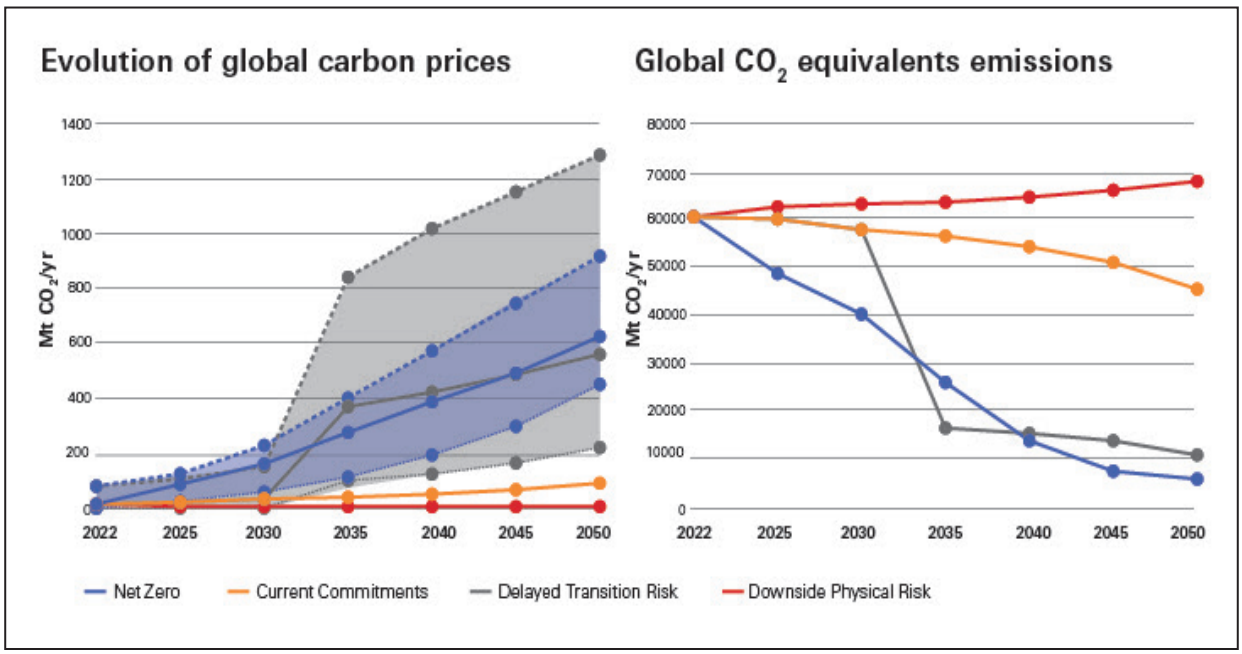
Water consumption in water - stressed areas[5]		Year[6]														
		2023					2022					2021				
		Branch	Data centre	Office	Total portfo-lio	% of Total portfo-lio	Branch	Data centre	Office	Total portfo-lio	% of Total portfo-lio	Branch	Data centre	Office	Total portfo-lio	% of Total port-folio
Number of sites located in or near water stressed areas	number of properties															
Fresh water consumed (withdrawals minus discharges of equal quality) in water-stressed areas for own operations[7,8]	mega ltr															

Climate scenario analysis

Overview of climate scenario analysis modelling framework[1]



Trajectory of global carbon prices and carbon emissions under our different climate scenarios[2, 3]



Financed emissions		2023				
		On-balance sheet financed emissions– wholesale credit lending and project finance[1,2]				
Sector	Year	Scope 1-2 (Mt CO2e)†	Scope 3 (Mt CO2e)†	Emissions intensity[4]	PCAF Data quality score[3,†]	
					Scope 1 and 2	Scope 3
Oil and gas	2021					
	2022					
Power and utilities	2021					
	2022					
Cement	2021					
	2022					
Iron, steel and aluminium	2021					
	2022					
Aviation	2021					
	2022					
Automotive	2021					
	2022					
Thermal coal mining	2020					

Facilitated emissions (33% weighting)		2023				
		Facilitated emissions – ECM, DCM and syndicated loans[5] (weighted at 33%)				
Sector	Year[6]	Scope 1-2 (Mt CO2e)†	Scope 3 (Mt CO2e)†	Emissions intensity[4]	PCAF Data quality score[3,†]	
					Scope 1 and 2	Scope 3
Oil and gas	2019					
	2020					
	2021					
	2022					
Power and utilities	2019					
	2020					
	2021					
	2022					

Facilitated emissions (100% weighting)		2023				
		Facilitated emissions – ECM, DCM and syndicated loans[1] (weighted at 100%)				
Sector	Year[2]	Scope 1-2 (Mt CO2e)†	Scope 3 (Mt CO2e)†	Emissions intensity[4]	PCAF Data quality score[3,†]	
					Scope 1 and 2	Scope 3
Oil and gas	2019					
	2020					
	2021					
	2022					
Power and utilities	2019					
	2020					
	2021					
	2022					

Targets and progress							
Sector[1]	Baseline	**2021**	**2022**	2022 % change vs. baseline	**2030 target**	Unit[2]	Target scenario
Combined on-balance sheet financed and facilitated emissions at 33%, with 3-year moving average							
Oil and gas						Mt CO2e	
Power and utilities						tCO2e/GWh	
On-balance sheet financed emissions							
Cement						tCO2e/t cement	
Iron, steel and aluminium						tCO2e/t metal	
Aviation						tCO2e/million rpk	
Automotive						tCO2e/million vkm	
Thermal coal mining						Mt CO2e	

Revisions	Reporting metrics	Previously reported		Recalculated metrics		Percentage change	
Sector		2019	2020	2019	2020	2019	2020
Oil and gas	On-balance sheet financed - Mt CO2e						
	Facilitated (100% weighting) - Mt CO2e						
Power and utilities	On-balance sheet financed -						
	Facilitated (100% weighting) -						

Environmental key facts				
		Year		
		2023	2022	2021
	Units			
Reporting Coverage as % of Group FTE				
Energy and travel greenhouse gas emissions[1,2]				
Scope 1	tonnes CO2e			
Scope 2 (market-based)	tonnes CO2e			
Scope 3 emissions				
Category 1: Purchased Goods and Services	tonnes CO2e			
Category 2: Capital Goods	tonnes CO2e			
Category 6: Business Travel	tonnes CO2e			
Total	**tonnes CO2e**			
Supply chain greenhouse gas emissions		Year		
		2023	2022	2021
Purchased Goods & Services[2]				
Scope 1 & 2	tonnes CO2e			
Data quality score[3]				
Scope 3	tonnes CO2e			
Data quality score[3]				
Total purchased goods & services (Scope 1,2 &3)	tonnes CO2e			
Capital Goods[2]				
Scope 1 & 2	tonnes CO2e			
Data quality score[3]				
Scope 3	tonnes CO2e			
Data quality score[3]				
Total capital goods (Scope 1,2 &3)	tonnes CO2e			

Our financed emissions[4]		Year				
Scope 3 - indirect (Downstream activities - investments and financed emissions)	Unit[5]	2023	2022	2021	2020	2019
Combined on-balance sheet financed and facilitated emissions						
Oil and gas	Mt CO2e	N/A				
Power and utilities	tCO2e/GWh	N/A				
On-balance sheet financed emissions						
Cement	tCO2e/t cement	N/A				
Iron, steel and aluminium	tCO2e/t metal	N/A				
Aviation	tCO2e/million rpk	N/A				
Automotive	tCO2e/million vkm	N/A				
Thermal coal mining	Mt CO2e					
GHG emissions intensity ratio[1]						
By Scope						
Scope 1 - direct	tonnes CO2e/FTE					
Scope 2 - indirect	tonnes CO2e/FTE					
Scope 3 - indirect (Category 1: Purchased Goods and Services)	tonnes CO2e/FTE					
Scope 3 - indirect (Category 2: Capital Goods)	tonnes CO2e/FTE					
Scope 3 - indirect (Category 6: Business Travell)	tonnes CO2e/FTE					
Total GHG emissions per FTE - Scope 1, 2 and 3 (category 6)	tonnes CO2e/FTE					
Total GHG emissions per FTE - Scope 1, 2 and 3 (category 1, 2 and 6)						
GHG emissions per m^2						
By Scope						
Scope 1	tonnes $CO2e/m^2$					
Scope 2	tonnes $CO2e/m^2$					
Scope 3 - Cat 1 (Purchased Goods & Services)	tonnes $CO2e/m^2$					
Scope 3 - Cat 2 (Capital Goods)	tonnes $CO2e/m^2$					
Scope 3 – Cat 6 (Business Travel)	tonnes $CO2e/m^2$					
Total GHG emissions per m^2 - Scope 1, 2 and 3 (category 6)	tonnes $CO2e/m^2$					
Total Total GHG emissions per m^2 - Scope 1, 2 and 3 (category 1, 2 and 6)	tonnes $CO2e/m^2$					
GHG emissions (Scope 1, 2 and 3 (category 6)) per FTE by region[6]						
Europe	tonnes CO2e/FTE					
Asia	tonnes CO2e/FTE					
North America	tonnes CO2e/FTE					
Latin America	tonnes CO2e/FTE					
Middle East and North Africa	tonnes CO2e/FTE					
Resource Efficiency[6]						
Energy						
Total electricity consumption	kWh in 000s					
Primary fuel sources (gas, oil, diesel etc.)	kWh in 000s					
Total energy consumption	kWh in 000s					
Of which:						
Total renewable electricity from PPA	kWh in 000s					
Renewable electricity from other sources	kWh in 000s					
Energy consumption per FTE	kWh/FTE					
Energy consumption per m^2	kWh/ m^2					
Waste						
Waste disposed	kilotonnes					
Waste recycled	kilotonnes					
Total waste produced	kilotonnes					
Waste disposed per FTE	tonnes/FTE					
% recycled	%					
Water						
Total water consumption	thousand m^3					
Water consumption per FTE	m^3/FTE					
Business travel						
Short haul air travel	million km					
Long haul air travel	million km					
Air travel	million km					
Rail travel	million km					
Road travel	million km					
Other travel	million km					
Total business travel	million km					
Business travel per FTE	km/FTE					

CO_2e: Carbon dioxide equivalent
FTE: Full-time equivalent employee

Scope 2 Electricity Dual Reporting

	2023		
	Market-Based Total (tonnes CO_2e)[1]	Location-Based Total (tonnes CO2e)	Instrument types[2]
Argentina			
Bahrain			
Mainland China			
France			
Germany			
Hong Kong			
India			
Malta			
Mexico			
Malaysia			
Middle East and Türkiye (excluding Bahrain)			
Philippines			
Poland			
North America			
Rest of Asia Pacific			
Switzerland			
United Kingdom			
Scope 2 Group Total (before uplift and scale up)			
Group total Scope 2 after uplift and scale up[3]			

Scope 2 Electricity Dual Reporting	2022		
	Market-Based Total (tonnes CO_2e)	Location-Based Total (tonnes CO2e)	Instrument types[2]
Argentina			
Bahrain			
France			
Germany			
Hong Kong			
India			
Malta			
Malaysia			
Philippines			
Mexico			
Middle East and Türkiye (excluding Bahrain)			
North America			
Rest Asia Pacific			
Switzerland			
United Kingdom			
Scope 2 Group Total (before uplift and scale up)			
Group total Scope 2 after uplift and scale up[3]			

Scope 2 Electricity Dual Reporting	2021		
	Market-Based Total (tonnes CO2e)	Location-Based Total (tonnes CO2e)	Instrument types[2]
Argentina			
Bahrain			
France			
Germany			
Hong Kong			
India			
Malta			
Mexico			
Middle East and Türkiye (excluding Bahrain)			
North America			
Rest Asia Pacific			
Switzerland			
United Kingdom			
Scope 2 Group Total (before uplift and scale up)			
Group total Scope 2 after uplift and scale up[3]			

CO2e: Carbon dioxide equivalent

Employee profile data

	Year				
	2023	**2022**	**2021**		
1) Number of employees by region					
Asia (excluding Hong Kong)					
Hong Kong					
Europe (excluding UK RFB)					
UK RFB					
Middle East and North Africa					
North America					
Latin America					
Total[1]					
	-				
2) % of employees by gender[2]					
All employees					
Male					
Female					
All senior leaders [3]					
Male					
Female					
Women in management[4]					
Group executive					
General manager					
Managing director					
All management positions					
Middle management positions					
Junior management positions					
Women promoted[5]					
Promotions to senior management					
Promotions to middle management					
Promotions to junior management					
% of employees by gender by region					
Asia (excluding Hong Kong)					
Male					
Female					

	Year				
	2023	2022	2021		
Hong Kong					
Male					
Female					
Europe (excluding UK RFB)					
Male					
Female					
UK RFB					
Male					
Female					
Middle East and North Africa					
Male					
Female					
North America					
Male					
Female					
Latin America					
Male					
Female					

	Year				
	2023	2022	2021		
3) % Senior leaders by Global Business	Male	Female	Male	Female	Male
Group					
Global Banking & Markets					
Commercial Banking					
Wealth and Personal Banking					
Digital Business Services					
Global Functions					
Other[6]					
UK					
Global Banking & Markets					

	Year				
	2023	2022	2021		
Commercial Banking					
Wealth and Personal Banking					
Digital Business Services					
Global Functions					
Other[6]					
US					
Global Banking & Markets					
Commercial Banking					
Wealth and Personal Banking					
Digital Business Services					
Global Functions					
Other[6]					
Hong Kong					
Global Banking & Markets					
Commercial Banking					
Wealth and Personal Banking					
Digital Business Services					
Global Functions					
Other[6]					
mainland China					
Global Banking & Markets					
Commercial Banking					
Wealth and Personal Banking					
Digital Business Services					
Global Functions					
Other[6]					
Mexico					
Global Banking & Markets					
Commercial Banking					
Wealth and Personal Banking					
Digital Business Services					
Global Functions					
Other[6]					

	Year				
	2023	2022	2021		
India					
Global Banking & Markets					
Commercial Banking					
Wealth and Personal Banking					
Digital Business Services					
Global Functions					
Other[6]					

	Year				
	2023	2022	2021		
4) % of employee by Ethnicity					
Group - all employees [7]					
Arab					
Asian					
Black					
Indigenous Group					
Hispanic					
White					
Two or more races/ ethnicities					
Other					
Not responded					
UK - all employees					
White					
Asian					
Black					
Mixed race					
Other [8]					
Prefer not to say					
Not responded					
US - all employees					
White					
Asian					
Black					
Hispanic					

	Year				
	2023	2022	2021		
Other[9]					
Prefer not to say					
Not responded					
Group - senior leaders[7]					
Arab					
Asian					
Black					
Indigenous Group					
Hispanic					
White					
Two or more races/ ethnicities					
Other					
Prefer not to say					
Not responded					
UK - senior leaders					
White					
Asian					
Black					
Mixed Race					
Other [8]					
Prefer not to say					
Not responded					
US - senior leaders					
White					
Asian					
Black					
Hispanic					
Other[10]					
Prefer not to say					
Not responded					
For details, please refer to the ' Representation and pay gaps' section on; P.77					

	Year				
	2023	2022	2021		
5) Representation and pay gap [11]					
a) By gender					
UK					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Pay gap[12] - Mean					
- Median					
Bonus gap[12] - Mean					
- Median					
US					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Fixed Pay gap[14] - Mean					
- Median					
Total compensation gap[14] - Mean					
- Median					
HK					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Fixed Pay gap[14] - Mean					
- Median					
Total compensation gap[14] - Mean					

	Year				
	2023	2022	2021		
- Median					
Mainland China					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Fixed Pay gap[14] - Mean					
- Median					
Total compensation gap[14] - Mean					
- Median					
Mexico					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Fixed Pay gap[14] - Mean					
- Median					
Total compensation gap[14] - Mean					
- Median					
India					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Fixed Pay gap[14] - Mean					
- Median					
Total compensation gap[14] - Mean					

	Year				
	2023	2022	2021		
- Median					
Singapore					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Fixed Pay gap[14] - Mean					
- Median					
Total compensation gap[14] - Mean					
- Median					
UAE					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Fixed Pay gap [14] - Mean					
- Median					
Total compensation gap [14] - Mean					
- Median					
Argentina					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Fixed Pay gap [14] - Mean					
- Median					
Total compensation gap [14] - Mean					
- Median					

	Year				
	2023	2022	2021		
Malaysia					
Female headcount by GCB					
3 and above					
4-5					
6-8					
Fixed Pay gap [14] - Mean					
- Median					
Total compensation gap [14] - Mean					
- Median					
b) Ethnicity pay gap (all ethnic minority groups) [11]					
UK					
Pay gap[13] - Mean					
- Median					
Bonus gap[13] - Mean					
- Median					
US					
Fixed Pay gap[14] - Mean					
- Median					
Total compensation[14] - Mean					
- Median					

	Year				
	2023	2022	2021		
6) Employees - top 5 nationalities (%)[15]					
All employees					
Chinese					
Indian					
British					
Mexican					
French					
Hong Kong [15]					
Senior leaders					
British					
Chinese					
Indian					
French					
German					

	Year				
	2023	2022	2021		
7) Tenure					
All employees					
0-5 years					
6-10 years					
11-20 years					
21-30 years					
>=31 years					
Senior leaders					
0-5 years					
6-10 years					
11-20 years					
21-30 years					
>=31 years					
Avg. years employed by gender					
Men					
Women					

	Year				
	2023	2022	2021		
8) By age bracket					
All employees					
<=29					
30-39					
40-49					
50-59					
>=60					
Employees by age bracket by region					
Asia (excluding Hong Kong)					
<=29					
30-39					
40-49					
50-59					
>=60					
Hong Kong					
<=29					
30-39					
40-49					
50-59					
>=60					
Europe (excluding UK RFB)					
<=29					
30-39					
40-49					
50-59					
>=60					
UK RFB					
<=29					
30-39					
40-49					
50-59					
>=60					

	Year				
	2023	2022	2021		
Middle East and North Africa					
<=29					
30-39					
40-49					
50-59					
>=60					
North America					
<=29					
30-39					
40-49					
50-59					
>=60					
Latin America					
<=29					
30-39					
40-49					
50-59					
>=60					

	Year				
	2023	2022	2021		
9) Employment type					
Full time					
Part time					

	Year				
	2023	2022	2021		
10) Employee turnover	Number	%	Number	%	Number
Total voluntary employee turnover					
By gender					
Male					
Female					

	Year				
	2023	2022	2021		
By age group					
<=29					
30-39					
40-49					
50-59					
>=60					
By region					
Asia (excluding Hong Kong)					
Hong Kong					
Europe (excluding UK RFB)					
UK RFB					
Middle East and North Africa					
North America					
Latin America					
Total involuntary employee turnover					
Total employee turnover					

	Year				
	2023	2022	2021		
11) New hires	Number	%	Number	%	Number
Total new hires					
By gender					
All employees					
Male					
Female					
By age group					
<=29					
30-39					
40-49					
50-59					
>=60					
By region					
Asia (excluding Hong Kong)					

	Year				
	2023	2022	2021		
Hong Kong					
Europe (excluding UK RFB)					
UK RFB					
Middle East and North Africa					
North America					
Latin America					
Senior leaders					
Male					
Female					

		Year				
		2023	2022	2021		
12)	Representation (snapshot self ID rates)	%	%	%		
	% of respondents answering snapshot demographic questions which identify as [16]					
a)	colleague with disability [17, 17.1]					
b)	LGB+ [18]					
c)	transgender or gender non-binary [19]					
d)	belonging to an ethnic minority [20]					
	For details, please refer to the 'Learning and skills development' section on; P.83					

		Year				
		2023	2022	2021		
13)	Employee training data [21]					
	Total training hours (in millions)					
	Training hours per FTE					
	Average training and development expenditure per FTE ($)					

	Year				
	2023	**2022**	**2021**		
	Average training hrs per FTE	% of Employees Trained	Average training hrs per FTE	% of Employees Trained	Average training hrs per FTE
Employees by gender					
Male					
Female					
Total					
Employees by employee category					
Senior employees (3 and above)					
Non senior employees (4-8)					
Contractors/contingent/consultants/ service providers					
	Year				
Training received on anti-corruption policies and procedures [22] by:	2023	2022	2021		
	% of Employees Trained	% of Employees Trained	% of Employees Trained		

Employee survey data (Snapshot)

	Year[1]			
	2023	2022	2021	2023 vs 2022
1) Employee engagement index[3]				
I am proud to say I work for this company				
Right now, I feel motivated by this organisation to do the best job I can[4]				
I would recommend this company as a great place to work				
2) Employee focus index				
I generally look forward to my work day				
My work gives me a feeling of personal accomplishment				
My work is challenging and interesting				
3) Strategy index				
I have a clear understanding of this company's strategic objectives				
I am seeing the positive impact of our strategy				
I feel confident about this company's future				
4) Change leadership index				
Leaders in my area set a positive example				
My line manager does a good job of communicating reasons behind important changes that are made				
Senior leaders in my area communicate openly and honestly about changes to the business				
5) Speak-up index[3]				
I believe my views are genuinely listened to when I share my opinion[5]				
I feel able to speak up when I see behaviour which I consider to be wrong				
I can state my opinion without the fear of negative consequences[6]				
6) Trust index				
I trust my direct manager				
I trust senior leadership in my area				
Where I work, people are treated fairly				
7) Career index				
My line manager actively supports my career development				
I feel able to achieve my career objectives at this company				

	Year[1]			
	2023	2022	2021	2023 vs 2022
I believe that we have fair processes and procedures for moving / promoting people into new roles				
8) Inclusion index[3]				
I trust my direct manager				
I feel able to achieve my career objectives at this company				
Where I work, people are treated fairly				
I feel a genuine sense of belonging to my team				
I feel able to be myself at work				
I can state my opinion without the fear of negative consequences[6]				
9) Other items				

Employee well-being data[7]

(% of respondents agreeing positively to the statement or question)

	Year			
	2023	2022	2021	2023 vs 2022
In general, how would you rate your mental health?[8]				
I am confident talking to my line manager about my mental health				
I know how to get support at this company about my mental health				
I feel able to take time off work when I experience a mental health concern				
Physical health: Nutrition[8]				
Physical health: Activity[8]				
Physical health: Sleep[8]				
Phyical health: Average of nutrition, activity and sleep				
I am able to integrate my work and personal life in a way that works for me				
I am confident talking to my line manager about my work-life balance/flexibility				
How well do you feel you manage financially?[9]				
I am confident talking to financial advisors / experts about my financial capability				
I know how to get support at this company about my financial capability				
Overall, how satisfied are you with your life nowadays[10]				

Employee engagement index breakdown

	Year			
	2023	2022	2021[11]	
By age group				
<=29				
30-39				
40-49				
50-59				
>=60				
By gender				
Male				
Female				
By management level[11]				
Senior management				
Middle management				
Junior management				
Strands[12]				
Colleagues with a disability				
LGB+				
Transgender				

Charitable Giving and Volunteering

Cash charitable giving	Year [1]		
	2023	2022	2021
	$m	$m	$m
Europe[2]			
- United Kingdom[3]			
- France			
Asia Pacific[2]			
- Hong Kong			
- mainland China			
- Singapore			
- Malaysia			
- Indonesia			
- Australia			
- India			
Middle East[2,4]			
- United Arab Emirates			
North America[2]			
- Canada			
- United States			
Latin America[2]			
- Mexico			
Total			

Employee volunteering

Volunteering during work	**Hours**	Hours	Hours
Europe			
Asia Pacific			
Middle East			
North America			
Latin America			
Total volunteering during work[5]			
Total volunteering during own time[5]			

Value of community contributions [1]

	$m	$m	$m
Cash charitable giving			
Value of employee volunteering in work time			
Management costs associated with charitable giving			
Total			

Complaints[1]

WPB Customer complaint volumes[2, 3, 4]	Year		
Complaints per 1,000 customers per month	**2023**	2022	2021
UK[5]			
France			
Hong Kong			
mainland China [6]			
US			
Canada			
Mexico			
UAE			

CMB Customer complaint volumes[2]	Year		
Annual complaint volumes ('000s)	**2023**	2022	2021
UK			
France			
Hong Kong			
mainland China			
US			
Canada			
Mexico			
UAE			

GBM Customer complaint volumes[2]	Year		
Annual complaint volumes	**2023**	2022	2021
Global Banking[7]			
Global Markets and Securities Services[9]			
Total			

Number of suppliers by geographical region	Year			
Annual complaint volumes	**2023 Number of normalised suppliers**	% per region	2022 Number of normalised suppliers	% per region
Asia-Pacific (excluding mainland China and Hong Kong) mainland China				
Hong Kong				
Europe (excluding UK)				
UK				
Latin America				
North America				
MENA				
Total				

Taxes paid by country/territory

	Year		
	2023	2022	2021
	$m	$m	$m
Europe			
– UK			
– France			
– Germany			
– Switzerland			
– other			
Asia			
– Hong Kong			
– Australia			
– mainland China			
– India			
– Indonesia			
– Malaysia			
– Singapore			
– Taiwan			
– Bangladesh			
– Vietnam			

	Year		
	2023	2022	2021
	$m	$m	$m
– Republic of Korea			
– Sri Lanka			
– other			
Middle East and North Africa			
– United Arab Emirates			
– Egypt			
– Türkiye			
– other			
North America			
– US			
– Canada			
– other			
Latin America			
– Mexico			
– Argentina			
– Brazil			
– other			
Year ended 31 Dec			

Credit Risk (Functional Requirement) - As per Reserve Bank of India

Note :- Kindly choose the status of functionality from the drop down menu

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
A	**Standardized Approach**		
1	**Bank data to Basel II Data Mapping***		
1.1	The system should provide graphical user interfaces (GUI) to map bank data to Basel II data. The following activities should be supported (but not limited to):		
	a. Bank customer types to Basel II customer types	U	
	b. Bank product types to Basel II product types	U	
	c. Bank security/collateral types to Basel II collateral types	U	
	d. Bank asset type/guarantor type to Basel II asset/guarantor type	U	
	e. The software should be flexible for the business user to use multiple factors such as customer constitution code, product type, exposure amount, legal status etc to perform Basel II asset classification.	U	
1.2	The user should be able to view the entire asset classification schema and it should be printable to be submitted for regulatory inspections and audits.	U	
	*The mapping should be done with respect of both IRB and standardized approaches		
2	**External credit ratings**		
2.1	The system should have the ability to map the domestic and international rating to the corresponding risk weight for all the asset class as specified under RBI Guidelines.	U	
2.2	The system should be able to capture multiple rating details for the obligors/exposures and risk weight assignment should happen as per RBI Guidelines (i.e. If two ratings are available then the one with higher risk weight should be used, and if more than two ratings are available then the lowest of higher two risk weights should be used).	U	
2.3	The system should support a user configurable interface with which multiple ratings can be assigned for obligors/exposures.	U	
2.4	The system should capture external rating details such as Rating Agency, Rating, Type of Rating (Long or Short Term, Issue or Issuer Rating), and Rating Date etc. from the Credit rating Software. Based on this information, the system should determine the eligibility of external rating for use in capital computations based on the rules specified in the RBI guidelines.If external rating details are not present in CRS, the system should permit the direct keying in of data.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
3	**Credit Risk Mitigation**		
3.1	The system should have the ability to map the Collateral/Security Types (which the bank uses for internal reporting) into collaterals types as per RBI Guidelines (Cash, Gold, KVP, Life Insurance, Debt Securities, and Mutual Funds etc).	U	
3.2	Provide a GUI to define the hair cuts for various collateral types as defined in RBI guidelines.	U	
3.3	The system should be able to apply supervisory haircut on exposures and mitigants, and compute capital after applying Credit Risk Mitigation techniques as per RBI Guidelines.	U	
3.4	The system should have the ability to assign the risk weights for Guarantors as per RBI Guidelines.	U	
3.5	The system should be able to capture the relevant data fields for Currency and Maturity Mismatch calculations and should also be able to apply the haircuts as per RBI Guidelines.	U	
3.6	The system should be able to capture collateral which is a basket of collaterals and should also be able to calculate the haircut on the basket of collateral. Haircuts applicable on the basket of assets should be taken into account while calculating the capital as per RBI Guidelines.	U	
3.7	The system should be able to perform on balance sheet netting and capital calculation based on the net credit exposure	U	
3.8	The system should be able to apply haircut scaling formula (based on holding period and frequency of /revaluation period) as prescribed by RBI Guidelines.	U	
3.9	The system should be able to capture guarantee, counter guarantee and credit derivative details	U	
3.10	The system should have the ability to perform optimal allocation of collateral when one or more collateral/guarantee is mapped to multiple exposure (many to many relationship). The user should be able to view and modify the objective equation and the constraints	U	
4	**CRAR computation**		
4.1	The system should have a user interface to capture the minimum Capital to Risk Weighted Assets Ratio (CRAR) prescribed by the RBI.	U	
4.2	The system should be able to capture and classify the regulatory retail exposures based on the qualifying criteria's such as Granularity, Orientation, Product and Low Value of Exposure	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.3	The system should be able to capture the aggregate exposure for Corporate, and the risk weight should be assigned as per RBI Guidelines	U	
4.4	The system should provide GUI based screens to define the capital computation rules for the following areas based on RBI guidelines:	U	
	Corporate, Banks, Domestic Sovereigns, Foreign Sovereigns, Public sector entities, Multilateral development banks, BIS, IMF, Indian Banks, Foreign Banks, Primary dealers, Corporate, Retail (Regulatory Retail, Home Loans, Consumer loans), Commercial Real estate, NPA, Venture Capital, Other assets, Off-balance sheet assets and any other asset classification which RBI may come up from time to time	U	
	Assign Credit Conversion Factor's(CCF's) for off-balance sheet items, undrawn portion of revolving loans as per RBI Guidelines	U	
	The system should be able to capture Failed Trades ('Delivery versus Payment' and 'Non Delivery versus Payment', i.e. unsettled securities and foreign exchange transactions) and should be able to calculate capital as per RBI Guidelines	U	
4.5	The system should compute CRAR under standardized approach	U	
4.6	The system should compute and report the gross exposure, value of risk mitigants, net exposure, risk weight and minimum capital charge under Basel-II/Basel- III for each account.	U	
4.7	The system should report the risk weighted assets and capital charge under each asset category as defined in Basel- II norms and at account level.	U	
B.	**IRB Approach**		
1	**Internal Rating System (applicable to all types of credit and investment exposures)**		
1.1	The proposed software solution should have flexible user interface, capable of interfacing with existing and future credit rating systems of the bank	U	
1.2	The proposed software solution should provide a statistical package/ tool for credit risk Model Development and Validation.	U	
1.3	The proposed software solution should have flexibility to add any number of rating models and scorecards in future.	U	
1.4	The system should have capability and statistical tools to create expert judgment, statistical and hybrid type of rating models/ score cards.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
1.5	The solution should fulfil requirements of Working Paper 14 of BCBS document for the validation of the rating systems.	U	
1.6	The model validation solution should be able to perform validation of:		
	Internal rating system for various portfolios	U	
	Scoring models and Probability of Default ('PD') models (retail, corporates, sovereign,equity and banks)	U	
	Loss Given Default ('LGD') models (retail, corporates, sovereign and banks)	U	
	Exposure at Default ('EAD') models (retail, corporates, sovereign and banks)	U	
1.7	The system should have capability to generate reports pertaining to any kind of model development and/or validation of rating models	U	
1.8	The system should be able to compute PD, LGD, CCF, M and capital calculations for the relevant asset classes as per FIRB and AIRB approach as per Basel II Guidelines.	U	
1.9	The system should be capable of computing PD for each borrower rating grade, LGD for each facility rating grade and EAD for each facility in case of corporate	U	
1.10	System should support the PD modelling methods for corporate exposures, including but not limited to the following methods:-		
	• Historical data based	U	
	• External rating mapping approach (in case of large corporate)	U	
	• Statistical PD model based approach (in case of SME)	U	
1.11	The system should support statistical modelling to enable the users to develop and deploy their own models for risk parameter estimation. The following statistical modelling features should be supported (at minimum):		
	• Sampling techniques (Simple, stratified, random etc)	U	
	• Missing value imputation	U	
	• Outlier detection and elimination	U	
	• Variable transformation	U	
	• Regression modelling (Simple, Multiple, Logit, probit, GLM, GLMM etc)	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
2	**Corporate, Sovereign and Bank Asset Class Models**		
2.1	System should have ability to track and store account-wise /customer-wise previous credit ratings/ scores and LGD. The system should also capture date of rating, type of rating, rating model and other related information.	U	
2.2	System should enable the user to define multiple portfolios or asset classes based on multiple dimensions (such as borrower constitution, industry, product type, loan amount etc but not limited to) and associate borrower rating model and facility rating models to the user defined portfolios.	U	
2.3	System should have a capability to take data related to balance sheet, profit & loss and cash flow statements from pre-defined Excel sheets and other data formats (viz. .txt, .XBRL, .CSV, .XML)	U	
2.4	The system should be able to capture and receive the required data (Data entry, File uploads, direct transfers, batch processes, etc) from various source systems like Core Banking Solutions, Internal Rating models in various formats (viz. .txt, .XBRL, .CSV, .XML, excel, PDF etc) and capital calculations (for all asset classes) as per RBI Guidelines under Standardized Approach, FIRB, AIRB and all other asset class specific approaches of Basel-II/ RBI.	U	
2.5	The solution should have the ability to map the internal risk grades of the specialized lending subclasses (PF, OF, CF, IPRE and HVCRE) to supervisory categories as per Basel-II guidelines.	U	
2.6	The solution should be able to support validation techniques, including statistical tools, for the non-retail rating models as per the requirements of working paper 14 of Basel Committee on Banking Supervision (May 2005) or any modification thereof and generate reports for the same for management oversight and effective portfolio management. The system should have the tools to validate credit rating models on continuous basis. Validation process should enable the Bank to assess the performance of internal rating and risk estimation methods consistently and meaningfully. The validation process should help the Bank to meet regulatory requirements of RBI.	U	
3	**Retail Rating Models**		
3.1	System should have a capability to develop expert defined models/ scorecards, statistically developed models/score cards and hybrid models and provide application and behavioural scorecards. The solution should enable the users to input the required details for application scorecard and compute the application score.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
3.2	The system should have the ability to capture retail exposures at an account level, assign each exposure to a particular retail pool based on well-defined risk drivers such as borrower type, demographics, products, collateral, delinquencies etc. (not limited to these dimensions) to estimate Pool PD, LGD and EAD. The system should form Homogenous pools of retail exposures formed in consultation with the Bank in compliance with IRB guidelines. The system should have capability to integrate subsequent changes in Pooling criteria.	U	
3.3	System should have a capability to compute behavioral score for the retail products as a whole on a periodic basis. The solution should be capable to interface with multiple data source systems (such as CBS, FTP) and fetch the required behavioral data and compute behavioural score of each retail borrower.	U	
3.4	The system should have a capability to generate reports and demonstrate that retail pooling models and methodology are compliant with the minimum requirement of IRB Approaches as per RBI guidelines.	U	
3.5	The solution should be able to validate the retail score card/retail pooling models as per the requirements of working paper 14 of Basel Committee on Banking Supervision (May 2005) or any modification thereof and generate reports for the same for management oversight and effective portfolio management.	U	
	The system should be able to compute and validate PD, EAD and LGD for each pool. The system should provide methodology and tools to validate retail pooling/score card models on continuous basis.(*Validation process should enable the Bank to assess the performance of retail pools, risk estimates and risk estimation methods consistently and meaningfully. The validation process should help the Bank to meet regulatory requirements of RBI. The vendor should help bank to get it validated through independent third parties. By independent third parties, we mean parties unrelated to vendor (not related parties/ subsidiaries, JVs etc) with satisfactory track record and past experience in this field. In this regard, vendor should give the bank a list of independent third parties acceptable to the bank and bank will retain the option to choose the validation carrying company*.)	U	
3.6	The system should be capable to capture and receive relevant data from Rating systems, CBS system etc without manual intervention.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4	**Capital Computation**		
4.1	The system should separately compute RWA under FIRB/AIRB. The solution should support Multiple Approaches and Multiple Jurisdictions, simultaneously, if required.	U	
4.2	The solution should support categorization of asset classes and sub classes as defined as per IRB approaches as given in the Basel II Accord / RBI guidelines (Corporate, Sovereign, Bank, SME, SL classes, Retail, QRRE, equity, purchased receivables, securitized etc.). The system should be capable of computing bank wide and asset class wise (including sub-categories like product-wise, specialized lending, SME, vertical wise etc) RWA, EL, UL and Capital (regulatory & economic)	U	
4.3	The solution should provide the ability to estimates Probability of Default (PD)/long run PDs using internal rating grades and default history across all exposure types.	U	
4.4	The solution should be capable for computing PD based on Internal loss history, External rating based, Statistical based approaches as described in the Basel II accord	U	
4.5	The solution should be capable of computing Through-the-cycle PD and Point-in-time PD. The system should be capable to convert a PIT PD to TTC PD and vice versa.	U	
4.6	The solution should support estimation of PD for low default and low data portfolios.	U	
4.7	The solution should support both the Foundation as well as Advanced approaches for collection of LGD data components and estimation of facility wise Loss Given Default (LGD) –both economic LGD and accounting LGD- across all exposure types (On and Off Balance sheet exposures), both for defaulted/ restructured accounts. The system should be capable of computing LGD using market based LGD, implied LGD and work-out method as per the nature, applicability and data availability of credit risk exposures. Further, the system should be able to drill down the LGD estimation into industry wise, vertical wise, product wise, workout method wise, year wise/ quarter wise/Other frequencies/, collateral-wise and offer additional drilldown options and reports. It should also support analytics for estimating PD & LGD correlation.	U	
4.8	The solution should distinguish between senior and subordinated facilities allocating required LGD to unsecured portion of the facility.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.9	The solution should provide for EAD and Effective Maturity (M) calculation for both on and off balance sheet items.	U	
4.10	The solution should be able to capture all types of risk mitigation inputs and should have the ability to reclassify/categorize the bank's risk mitigation tools into Basel defined risk mitigation inputs types as per Basel II Guidelines/ RBI guidelines. The solution should be able to allocate different collaterals to different facilities using multiple algorithms, approaches (Simple, comprehensive, FIRB, AIRB) and Basel-II guidelines by RBI. The solution should be able to use double default methodology for capital computation.	U	
4.11	The system should compute and report the gross exposure, value of risk mitigants, net exposure, PD, LGD, EAD and minimum capital charge under IRB approach of Basel-II/Basel- III for each account	U	
5	**Bank data to Basel II Asset Class Mapping**		
5.1	In addition to the eligible financial collateral recognized in the Standardized approach, the solution should recognize the other eligible FIRB/AIRB collaterals and provide necessary treatment as outlined in the Basel II accord/RBI guidelines. The system should allow user to compute value of eligible IRB collaterals (viz. minimum - collateralization or over - collateralization or under -collateralization).	U	
5.2	The solution should have the ability to compute, make estimates, and apply haircuts on collaterals and exposures as per Basel-II accord/ RBI guidelines on IRB approach. The system should be capable of applying a weighted average of haircut if the collateral is basket of assets.	U	
5.3	The solution should make adjustments for different holding periods based on the quality of collaterals and non-daily mark to market or re-margining.	U	
5.4	The solution should provide for effective LGD where the Bank is having other financial/AIRB collaterals and pool of collaterals.	U	
5.5	The solution should provide exposure adjustment by segmenting it into portions covered by different collateral and guarantee types and portion remaining unsecured as per Basel-II/ RBI guidelines.	U	
5.6	The solution should provide necessary treatment for repo style transactions/ guarantees/ credit derivatives under both foundation as well as advanced approaches.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5.7	The solution should be able to generate PD, EAD, LGD for sub-portfolio like industry, sector, Geography etc.	U	
5.8	The system should be able to compute Downturn default weighted LGD/ as well as per RBI/ Basel guidelines.	U	
5.9	The solution should support development of multiple PD, LGD & EAD models and should enable for validation. The bidder should help bank to get these models validated through independent third parties. In this regard, vendor should give the bank a list of independent third parties acceptable to the bank and bank will retain the option to choose the validation carrying company. Once the bank chooses the validation carrying company, the vendor has to cooperate with the validation carrying company and get the validation done. By independent third parties, Bank means parties unrelated to vendor (not related parties/ subsidiaries, JVs etc) with satisfactory track record and past experience in this field.	U	
5.10	The system should provide statistical tools such as, HHI Index, Gini co-efficient, Cumulative Accuracy profile, Receiver Operating Characteristic (ROC), etc.	U	
5.11	The system should have the ability to capture and map PD, LGD, EAD and Maturity for the FIRB/AIRB asset classes and apply the same in capital calculations.	U	
5.12	System should generate transition matrix for multiple period. Transition matrix should be generated for asset classes, industry/ region/country/product/business segment etc	U	
5.13	The system should be capable of performing pooling based on statistical analysis, application/ behavioral scores and expert judgment. At a minimum the system should support clustering techniques such as CART, CHAID and regression trees etc. The logic of pooling should be configurable in the system. The pooling logic is subject to change on at least at a yearly basis. Hence the definition of pooling logic should be through a graphical user interface and should not require any programming or vendor assistance. The system should have the capability to validate retail pools and generate reports (as per the requirements of working paper 14 of Basel Committee on Banking Supervision or any modification thereof).	U	
5.14	System should generate correlation matrix for industries, ratings, zones, facility etc.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5.15	The system should have the provision to run FIRB/ AIRB approach for certain asset classes and Standardized approach for other asset classes in the same execution.	U	
5.16	The system should be able to store data for minimum seven years across all asset classes, which in turn can be used for modeling the IRB risk components.	U	
5.17	The system should be able to store minimum seven years of data for PD, LGD and EAD modeling.	U	
5.18	The system should be able to store the data for at least seven years at an account/transaction level to perform the pooling process.	U	
5.19	The system should have the ability to assign/map new exposures into the created pools.	U	
5.20	The system should generate reports to monitor/track pool stability and accuracy.	U	
5.21	The system should be able to perform firm-size adjustment for small and medium size entities.	U	
5.22	The system should be able to apply double default treatment for the hedged portion and guaranteed portion and compute capital requirement for double default.	U	
5.23	In case of maturity mismatch for double default transactions and other transactions, the system should be able to perform the maturity adjustment as per Basel II Guidelines. The system should be able to do calculations for currency mismatches also.	U	
5.24	The system should be able to perform capital calculation for equity exposures via the following approaches:		
	• Market Based Approach	U	
	• Simple risk weight method	U	
	• Internal Models Method	U	
	• PD/LGD Based Approach	U	
5.25	The system should support VaR model (99th percentile, one tailed), i.e. the system should have the ability to build VaR Model. The system should be able to take the equations as per regulatory formulas and perform capital calculations.	U	
5.26	The system should be able to support an interface with Treasury systems from where the VaR numbers can be fetched.	U	
5.27	The system should be able to calculate capital charges for default and dilution risk for purchase receivables (corporate and retail exposures).	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5.28	The solution should provide methodology for computation of Expected Loss (EL) and Unexpected Losses (UL), RWAs for Credit risk under both foundation as well as advanced approaches.	U	
5.29	The solution should provide calculation of best estimate of Expected Loss; compute RWA, capital for defaulted/NPA exposures as per RBI/ Basel IRB approaches.	U	
5.30	For Default risk, the system should be able to apply Top-down Approach or Bottom up Approach for both corporate and retail exposures (purchase – receivable asset class wise). Also based on the exposure type, the system should be able to apply retail or corporate risk weight functions to arrive at the default risk weight.	U	
5.31	The system should be able to calculate capital for Traditional and Synthetic Securitization exposures.	U	
5.32	The system should be able to capture the bank's role (e.g. Originator, investor etc) for the securitization exposures, various credit enhancements and should calculate the capital as per Basel II Guidelines.	U	
5.33	The system should have CCF's models and calculate capital for securitization exposures with early amortization features.	U	
5.34	The system should be able to apply the supervisory formula for capital calculation of Securitized Exposures as per Basel II / RBI Guidelines.	U	
5.35	The system should be able to capture Failed Trades ('Delivery versus Payment' and 'Non Delivery versus Payment') i.e. unsettled securities and foreign exchange transactions) and should be able to calculate capital as per Basel II Guidelines.	U	
5.36	The system should be able to perform Stress testing and Back testing, which will allow Justification of the capital computation for all the asset classes.	U	
5.37	The system should have the ability to perform the stress tests (for all the asset classes) for PD, LGD, EAD, CCF and Maturity. System should be able to Simulate stress test on various parameters like PD, EAD, and LGD for Capital requirement & RAROC. Examples of scenarios that could be used are:	U	
	• Economic or industry downturns	U	
	• Market Risk events	U	
	• Liquidity conditions	U	
	• Bank specific scenarios	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5.38	System should be able to generate alerts for initiating management action in case of stress situation.	U	
5.39	Bidder should independently develop and validate the required models for PD, LGD, EAD, CCF and Maturity for on and off-balance sheet exposures.	U	
5.40	For estimation of EAD & CCF, it should also do undrawn analysis, UGD analysis etc and generate reports.	U	
5.41	The system should be able to define portfolio based upon the following aggregation possibilities such as:		
	• Counter-party or combination of counter parties	U	
	• Industry	U	
	• Tenor	U	
	• Product	U	
	• Geography	U	
	• Issuer	U	
	• Credit rating	U	
	• Any internal hierarchy	U	
	And should allow drill down capabilities up to transaction level.	U	
5.42	The system should be able to perform portfolio analysis by fixing and measuring exposures and limits inclusive of correlation effects within portfolio parameters. This should be in line with the Basel /RBI guidelines on correlation measurement such as Default/Asset Price correlation.	U	
6	**Reporting**		
6.1	The system should be capable of generating various Bank- defined reports like: (System should have the capability to generate back dated reports)	U	
	• Borrower Information report	U	
6.2	• Industry Analysis report	U	
6.3	• Monitoring (Account-wise report to cover rating transition & trend in critical identified parameters)	U	
6.4	• Peer group Analysis report	U	
6.5	• Rating wise reports	U	
6.6	• Portfolio reports	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6.7	• Borrower-wise risk score report	U	
6.8	• Borrower-wise risk grade report	U	
6.9	• Borrower-wise year wise risk score report	U	
6.10	• Borrower-wise year wise risk grade report	U	
6.11	• Industry Concentration Report	U	
6.12	• Industry- wise risk score report	U	
6.13	• Industry- wise risk grade report	U	
6.14	• Region wise Concentration Report	U	
6.15	• Region wise risk score report	U	
6.16	• Region - wise risk grade report	U	
6.17	• Quick mortality Report	U	
6.18	• Defaulted Account Report (Grade wise/ Industry wise/ year wise/ ownership wise/ size wise/ on-balance sheet/ off-balance sheet exposure wise for a date range etc)	U	
6.19	• RAROC reports- vertical wise, geography wise, rating grade wise etc.	U	
6.20	• Capital Charge-credit risk (Regulatory and economic) – expected and unexpected losses	U	
6.21	Exposure Reports:- Such reports generally include	U	
	The break up of total exposure based on Sector, industry, credit rating, Client, Loan Size, Maturity, country, currency, on-balance sheet off-balance sheet exposure, interest rate wise, floating rate wise, internal and external benchmark, fixed rate wise etc.	U	
6.22	The report giving NPA position separately under each of abovementioned categories along with reports on accounts which have been upgraded from NPA and which have slipped to NPA from standard,	U	
6.23	The report showing position of restructured accounts under each of abovementioned categories along with reports on accounts which have been upgraded from restructured and which have slipped to NPA from restructured status etc	U	
6.24	Report on restructured exposures, repeated restructured accounts and drill down options like industry-wise, rating-grade wise, curing-wise, tenor wise, sacrifice wise, product-wise, vertical-wise, region-wise, branch-wise, asset class-wise.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6.25	The reports should be able to cut across asset classes and give combined reports, if needed, while analyzing industry-wise, product-wise, sector-wise reports (e.g.: exposure to cement industry report should combined and render a consolidated report on all exposures under various asset classes)	U	
6.26	Collateral Reports (Collateral wise exposure report (total exposure after netting that is covered by 1. eligible financial collateral 2. other eligible AIRB collateral 3. guarantees etc). including current market value of collateral wherever applicable as per policy of the Bank	U	
6.27	Exception reporting:	U	
	• System should provide ability to monitor post facto limit exceptions, System should be generate a list of accounts which are due for rating (i.e pending list of accounts which are not rated in accordance with Bank's policy)	U	
	• System should be able to track and indicate loans contract expiring but still unsettled	U	
	• System should be able to track exceptions for loans in which collateral coverage falls below the required level	U	
	• System should be able to track exceptions for exposure exceeding the limit at facility level	U	
	• System should be able to track exceptions for overdue for e.g. overdue for principal, interest amount etc	U	
	• System should support tracking and breach generation of loans pending for renewal	U	
7	**Collateral Management**		
7.1	The solution should have facilities for extracting, displaying and exporting the following details, but not limited to, from the source systems (or enterprise data warehouse as and when functional) vide user defined reports or system triggered alerts	U	
	Collateral and Guarantor details		
	• Nature/description of collateral securities	U	
	• Data points to enable classification of collateral in to IRB eligible collateral as per:	U	
	• regulatory considerations along with classification outcome	U	
	• Collateral(s) and the list of related facilities	U	
	• Legal relationship between collateral provider and borrower	U	
	• Personal / Corporate guarantor information including means/net worth of guarantor	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
7.2	**Collateral Valuation**		
	Valuation details including date of valuation, name of valuer, next valuation due date, frequency of valuation based on type of collateral and margin details	U	
7.3	**Guarantees accepted /credit default swaps purchased by the Bank:**		
	• Data points to assess eligibility of the same as means of credit protection along with existing status of eligibility for capital relief under IRB regulatory guidelines prescribed.	U	
	• Details of the guarantee taken as part of the loan including comprehensive details of the guarantor(s).	U	
	• Value of the guarantee/CDS including the % of facility covered and exclusions in guarantee/CDS agreement.	U	
	• Linkage between the guarantees and its facilities.	U	
7.4	**Collateral documentation and storage:**		
	• Details of documents to be collected as per the legal opinion, name of the empanelled lawyer providing opinion, etc. along with details of those already collected- list of documents to be given by Legal Dept	U	
	• Details of the legal documents actually collected for each product type.	U	
	• Storage/despatch details of the documents of title to securities.	U	
	• Work flow Status for monitoring of the movement of the security documents from the storage till the final release to the customer.	U	
7.5	**Legal aspects of collateral:**		
	• Details of legal documentation collected pertaining to the facility including deviations if any.	U	
	• Information from external sources like Ministry of Corporate Affairs, central registry of properties.	U	
7.6	**Insurance:**		
	• Details of the security- insurance company, validity of the policy, exclusions from the policy, insured amount etc.	U	
	• Providing alerts when insurance pertaining to a collateral falls due for expiry	U	
7.7	Expiry reports on collateral (Due for expiry/expired)- bank/region/ branch/account wise	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
7.8	**Others:**		
	• Details for treatment of pools of collateral, maturity and currency mismatches.	U	
	• Details of the actual realisation value during sale/auction of securities when they are classified as NPA.	U	
	• Associated costs related to sale and recovery such as but not limited to legal costs, administrative costs, haircuts and other disposal costs and related time for completing sale of assets	U	
8	**Credit Risk Stress Testing and Event Identification**		
8.1	The system should have the capability to create, edit and maintain a scenario library containing both bank-wide and business unit specific scenarios with assumptions, portfolios and considered exclusion etc.	U	
8.2	The system should have the ability to execute stress tests at a portfolio (or exposures at a bank level) or a sub-portfolio or transaction level and should provide ability to capture supporting information such as:	U	
	• Scenario description and key assumptions.	U	
	• Macroeconomic and industry specific data for specific stress testing themes based on particular business groups and pre-defined scenarios.	U	
8.3	The system should have the following capabilities with respect to the requirements for Stress Testing:	U	
	• The system should have the ability to set triggers for industries based on predetermined thresholds for Key Risk Indicators (KRIs) to alert the IRMD for initiating stress tests.	U	
	• The system should have the capability to link the primary industries with the identified ancillary or second-order industries based on correlations.	U	
8.4	The credit risk stress testing module should support quantifying the impact of stress scenarios on the following performance measures at the Bank level and for sub portfolios (e.g. Corporate loans, Treasury Portfolios, etc.):	U	
	• Expected loss;	U	
	• Provisions on defaulted exposures;	U	
	• Unexpected loss;	U	
	• Risk weighted assets;	U	
	• Profitability;	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
	• Growth in Non-Performing Assets on selected portfolios	U	
	• Growth Rates of the bank across Core Industries	U	
	• Total Income of the Bank	U	
	• Economic capital; and	U	
	• Capital Ratios (e.g. CRAR)	U	
	• Other parameters as decided by the bank	U	
8.5	The system should support facility by facility and/or higher level portfolio or geography level stress testing to exposures and credit risk parameters, as part of overall stress testing scenario.	U	
8.6	System should capture the management action recommended for the scenarios based on the severity of the results of the scenarios.	U	
8.7	The system should provide ability to compare the following measures for base and stressed conditions: exposures, credit risk parameters and resulting capital and loss estimates.	U	
8.8	System should provide ability to apply stress test scenarios for the current as well as simulated portfolios of the Bank.	U	
8.9	The system should be capable of performing/supporting reverse stress testing including linking potential scenarios to targeted capital or tail losses	U	
8.10	System should have the ability to connect with authentic external sources to extract information on economic factors, industry trends etc.	U	
8.11	Based on extraction of data, the solution should be able to:		
	• Aggregate credit exposure and credit equivalents for non-funded products including derivatives and other market based product exposures based on rules. Maintain different rules for credit exposure aggregation for different purposes (for e.g. regulatory capital purposes vs. economic capital calculations) and utilisation visà- vis risk based limits.	U	
	• Ability to measure and distinguish direct, indirect and contingent exposure for various portfolios and sub portfolios (e.g. borrower, borrower groups, industry, country, product group, geographical clusters etc).	U	
	• Ability to aggregate and consolidate credit exposures across domestic and international locations as per prudential norms set out by the regulator(s).	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
9	**Model Validation capabilities**		
9.1	Solution should contain statistical package to support model validation tests and PD validation tests such as:	U	
	• Discriminatory power test	U	
	• Frequency and cumulative distribution graphs for both defaulters and non-defaulters Cumulative Accuracy Profile (CAP) and its summary index, the Accuracy Ratio (AR) Receiver Operating Characteristic (ROC) or the Area Under Curve (AUC) and its summary indices.	U	
	• the Gini	U	
	• KS Statistic	U	
	• Pairwise correlations	U	
	• Expert ranking correlation	U	
	• Kendall's τ and Somers' D (benchmarking)	U	
	• Brier Score	U	
	• Calibration accuracy test	U	
	• Observed default rates compared to PDs for overall portfolio and at each rating grade.	U	
	• Binomial test	U	
	• Chi-square test	U	
	• Normal test	U	
	• Traffic lights approach	U	
	• Observed migration compared to projected migrations	U	
	• Stability analysis	U	
	• Population Stability Index (PSI)	U	
	• Rating migration matrix to illustrate rating stability	U	
	• Granularity	U	
	• Herfindahl Index (HHI)	U	
	• Concentration per rating over time	U	
9.2	Solution should contain statistical package to support LGD model validation. The techniques supported shall include but are not limited to:	U	
	• Discriminatory Power	U	
	• Frequency and cumulative distribution graphs for observed and actual losses per LGD bucket (or percentile).	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
	• Proxy Gini measure	U	
	• Pair-wise correlations	U	
	• Calibration	U	
	• Observed loss rates compared to average predicted LGD for the overall portfolio and per loss bucket (or percentile)	U	
	• Applying ordinary least squares to fit the best linear regression, compare the observed versus the predicted LGD	U	
	• R-squared, Correlation Observed versus predicted: recovery rate, cure rate, collateral values post default,time to default, recovery costs	U	
	• Stability	U	
	• LGD migration between buckets (or percentiles)	U	
	• Population stability index of: Key risk drivers including recoveries, collateral values (pre and post default), recovery cost, cure rate and time to default and Overall output	U	
	• Granularity	U	
	• Herfindahl index	U	
	• Concentration per LGD bucket (or percentile) over time	U	
9.3	Solution should contain statistical package to support EAD model validation. The techniques supported shall include but are not limited to:	U	
	• Discriminatory Power	U	
	• Frequency and cumulative distribution graphs for observed and actual EADs.	U	
	• Calibration Accuracy	U	
	• Test if the average observed EAD equals the average predicted EAD	U	
	• Applying ordinary least squares to fit the best linear regression, compare the observed versus the predicted EAD	U	
	• R-squared, Correlation	U	
	• Stability	U	
	• EAD migration between buckets (or percentiles)	U	
	• Population stability index of overall EAD outputs	U	
9.4	The solution should include/support corporate and macro-economic variables included in the pre-defined mart, allowing their use in models namely Altmans Z through variables definitions and Pluto-Tasche method for LDP's	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
10	**Credit Risk based Pricing**		
10.1	The system should support enable computation of Risk based Pricing as per the methodology defined linking it to the Rating grades and the PD bands separately for retail and corporate accounts.	U	
10.2	The system should be able to aggregate cost of funds, operating expenses, cost of capital and other costs, spread and risk premium as calculated using PD and assumed LGD values.	U	
10.3	The system should embed standard pricing calculations and policies into the loan origination workflow, and understand the impact of each deal on the shareholder value.	U	
10.4	System should allow monitoring of deals that have been approved by the business below the hurdle rate defined by the bank. This should include details such as reason for override, amount of override, approver, relationship manager etc., along with complete documentation on workflows and pricing calculations to assist in improvement of the pricing process.	U	
10.5	System should capture audit trails to satisfy regulatory requirements that the risks inherent in loan products and services have been adequately accounted for in the pricing of loans.	U	
10.6	System should have adequate controls to ensure that loan pricing practices comply with bank policies and strategy including authorization and also facilitate adequate reporting to appropriate levels of all exceptions.	U	
10.7	The tools for arriving at RAROC and Risk based pricing basis Regulatory and economic capital to include all relevant relationship components (revenues and expenses) and also carry capability to depict future profitability/returns	U	
10.8	The comparison of pricing for different customer views e.g. industry, product, geography, business unit, related MIS and reporting on the corporate portfolio should be enabled at the Head office level	U	
10.9	The system should enable branch / Relationship managers to price deals, offer, alternatively deal structures, and respond to customer requests by direct input of necessary details.	U	
10.10	The system should calculate a price based on a target performance metric and recalculate performance if a price override is granted	U	
10.11	System should provide complete flexibility and control. It should pull in data from third-party systems and internally built tools, as well as adjust the data to create a differentiated pricing approach. It shall also retain audit trail	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
10.12	The system should have the flexibility to compute Risk-Based Capital (Capital at Risk or Economic Capital) calculations based on aggregation of:	U	
	• Value at Risk	U	
	• Expected and unexpected losses from exposure, default rates and recoveries	U	
10.13	Calculation of Risk Adjusted Return on Capital (RAROC) based on regulatory capital as well as economic capital. The system should be able to calculate capital requirement individual account wise and also units-wise such as:	U	
	• Entire Bank	U	
	• Region/zone	U	
	• Geography	U	
	• Industry	U	
	• Business segments	U	
	• Products	U	
	• Rating wise	U	
	• Branch	U	
	• Relationship Manager – Branch Manager/Field Functionary	U	
10.14	• The system should be able to compute RAROC and SVA for each facility on an ex-post basis. The RAROC and SVA should also be computed for each user defined portfolio. (For example, Corporate Portfolio, Home Loan Portfolio, Rating grade , etc)	U	
	• The system should be able to interface with FTP system to fetch the cost of funds.	U	
	• The system should be able to compute the risk premium to be charged at a rating grade level, product level and transaction level based on incremental capital required to fund the transaction	U	
10.15	The system should be able to provide risk adjusted performance evaluation. The evaluation should be across Business Units, portfolios and sub-portfolios. The system should allow the user to incorporate further evaluation subjects.	U	
	The system should allow for input of expert judgement into the performance evaluation system	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
10.17	The system should have the pre-built templates and should also have the functionality for a business user to define and customize Credit Risk MIS across all matrix dimensions such as:	U	
	• Counter-party	U	
	• Portfolio	U	
	• Product	U	
	• Geography – country/ state/zone/branch	U	
	• Industry	U	
	• Concentrations	U	
	• Risk Profiles	U	
10.18	The solution should be able to generate Risk Profile Template as per RBI guidelines and other branch-wise risk profile templates for credit risk as per Bank's internal requirements.	U	
11	**Limit Setting and Approval**		
11.1	Provide capability to identify portfolios based on risk profile aggregation along with ability to define and determine portfolio limits (across various dimensions e.g. industry, sector, rating group) based on risk based approach (e.g. internal rating scale)	U	
11.2	Be able to develop and support optimization models (e.g. Hill Climbing Algorithms) to determine credit limits.	U	
11.3	Provide workflow mechanism to manage a rule-based limit approval process. Ability to configure multiple approval workflows depending on business lines, products and other considerations.	U	
11.4	Maintain complete audit trail of the changes made with respect to change/approval of limits.	U	
11.5	Incorporate the effects of netting agreements, collateral and credit risk transfer mechanisms (Credit Default Swap (CDS) and guarantees) while computing portfolio risk for the bank.	U	
11.6	Provide ability to calculate credit P/L for the portfolios considering default / nodefault and rating-transitions.	U	
11.7	Provide ability to compute credit portfolio metrics including Expected Loss (EL), Unexpected Loss (UL), Credit VaR (CVaR) and Expected Shortfall (ES) on marginal and standalone basis for various portfolios and sub portfolios.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
11.8	Have capability to capture inputs of bank strategy across parameters such as growth in exposure to specific sectors, regions, products etc.	U	
11.9	Periodic alerts to users when limit is due for review	U	
12	**Exposure Calculation, Aggregation and Concentration Risk**		
12.1	Non-Fund Based Market Related Off balance sheet items	U	
	The system should be able to estimate exposure for different purposes:	U	
	Regulatory Capital calculations	U	
	Economic Capital Calculations	U	
	Credit Risk Control purposes (e.g. Limit setting, Concentration monitoring)	U	
12.2	System should be able to determine Mark to Market (MTM) or replacement value using full-revaluation approach for the following set of indicative products:	U	
	Derivative products – FRAs, Interest Rate Swaps, Cross Currency Swaps, FX forward, and FX options;	U	
	Equities;	U	
	Mutual Fund units;	U	
	Corporate Bonds, Government Securities, Hybrid Securities;	U	
	Structured notes (e.g. CLNs, CDOs); and	U	
	Money market products – Commercial papers, Commercial deposits, repos, reverse repos	U	
12.3	System should provide ability to determine Potential Future Exposure (PFE) for off balance sheet items including derivatives and other non-fund based banking products for normal market conditions and stress market conditions. The system should be able to compute the credit equivalent using current credit exposure method.	U	
12.4	System should be able to determine Potential Future Exposure using different approaches:	U	
	Monte-Carlo simulation based approach.	U	
	Credit Conversion Factor (CCF) based approach (MTM + Add-on approach).	U	
	Any other relevant advanced methods that are widely in use Internationally	U	
12.5	System should provide ability to compute Credit Value Adjustment (CVA) as prescribed by RBI in Basel-III guidelines.	U	

Sl. No	Credit Risk Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
12.6	System should provide ability to compute CVA on marginal basis and standalone basis at trade level and portfolio levels	U	
12.7	**Non Fund Based Non Market Related**		
	The system should be able to estimate exposure for different purposes through CCF estimation:	U	
	Regulatory Capital calculations	U	
	Economic Capital Calculations	U	
	Credit Risk Control purposes (e.g. Limit setting, Concentration monitoring)	U	
12.8	**Based on extraction of data, the solution should be able to:**		
	Aggregate credit exposure and credit equivalents for non-funded products including derivatives and other market based product exposures based on rules	U	
12.9	Ability to measure and distinguish direct, indirect and contingent exposure for various portfolios and sub portfolios (e.g. borrower, borrower groups, industry, country, product group).	U	
12.10	Maintain different rules for credit exposure aggregation for different purposes (for e.g. regulatory capital purposes vs. economic capital calculations) and utilisation visà- vis risk based limits.	U	
12.11	Ability to aggregate and consolidate credit exposures across domestic and international locations as per prudential norms set out by the regulator(s).	U	
12.12	The system should be able to Support measurement of concentration risk across different categories of exposures, for e.g. Top 20 single borrowers, Top 10 group borrowers, Top 20 depositors etc	U	
12.13	Model risk correlations among different borrowers /sectors / industries, etc. and factor it in concentration risk management	U	
12.14	Measure concentration risk using different measures, for e.g. Lorenz Curve, Herfindahl-Hirschman Index (HHI), Gini coefficient.	U	
12.15	Measure diversification benefit on a dynamic basis for the bank on a standalone and consolidated basis	U	
12.16	Integration with loan proposal and review systems for monitoring concentration prior to sanction.	U	
12.17	Provide workflow for approval of limit breaches with adequate audit trails.	U	
12.18	Provide alerts on dynamic basis before exposure is sanctioned to identify breaches	U	

Market Risk Functional Requirement - As per Reserve Bank of India

Note :- Kindly choose the status of functionality from the drop down menu

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
1	**Preparation of capital charge computation report under SMM for market risk**		
1.1	The system should interface with external market information systems including Reuters, Bloomberg, NSE, BSE, FIMMDA, CRISIL Bond valuer , CCIL, AMFI, FEDAI and NDS to obtain pricing feeds	U	
1.2	The system should extract position data from the treasury system by interfacing without manual intervention to perform valuations whenever required by the user . A single engine will be used for valuation. This engine will be from the market risk system.	U	
1.3	The system should be capable of validating data at the interface level to enable perform of key reconciliation checks between position data in the treasury system and market risk system	U	
1.4	The system should segregate position data obtained from the treasury system in line with the risk classifications prescribed for SMM i.e. equity, forex/ bullion, interest rate risk and derivatives	U	
1.5	The system should be in a position to compute modified duration based on for all interest rate instruments including floating rate bonds and zero coupon bonds taking into account the optionality attached to it. The system should be capable of exempting certain investments from Mduration computation and aggregation.	U	
1.6	Computation of modified duration should be done based on external price data extracted from the treasury system as well as for price data manually input into the market risk system. The market risk system should provide a data capture field where required for such an updation. However the requirement for manual input of price data should be minimal and restricted to few products where valuation is complex like OCCPRS and Unlisted securities	U	
1.7	The system should be able to compute modified duration from PV01.	U	
1.8	In case of interest rate derivatives, the system should be in a position to identify back-to-back trading positions based on current RBI guidelines that are treated as matched positions (i.e. having critical terms matching with a 15bps spread on the fixed leg) and derivatives undertaken for hedging (other than to hedge trading book positions). These should be excluded from the computation of market risk capital charge.	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
1.9	In case of floating rate bonds, the system should perform the valuation in line with current FIMMDA guidelines	U	
1.10	Valuation of forex positions would be required to be undertaken based on FEDAI rates on monthly basis and based on input from market data providers on daily basis. System should be able to compute forward prices based on both	U	
	1) Interest Rate Parity method	U	
	2) Forward premiums available from market data vendor	U	
1.11	The system should be in a position to capture the NOOP limit and treat the higher of NOOP or actual open position in equivalent USD terms as the basis for computing forex/ bullion position	U	
1.12	The system should support the following three methods for determining the option position and computing capital charge:		
	1) Simplified Approach	U	
	2) Delta- Plus Approach	U	
	3) Scenario Approach	U	
1.13	The system should be in a position to bucket interest rate risk positions in different time-bands zones as prescribed by RBI based on residual maturity.	U	
1.14	The system should apply horizontal and vertical disallowances based on prevalent RBI guidelines	U	
1.15	The system should be able to treat interest rate swaps as a combination of two equivalent securities for the purpose of determining risk position and computing modified duration	U	
1.16	For the floating leg of an interest rate swap, modified duration should be computed based on the next reset	U	
1.17	The system should be able to compute the modified duration based on the PV01 of the floating leg of the interest rate swap	U	
1.18	The system should be able to apply the relevant market risk capital charge depending upon the portfolio classification	U	
1.19	The system should be in a position to compute capital charges for the AFS portfolio in the following manner:		
	- Compute general and specific charge as for HFT	U	
	- Compute alternative capital charge for specific risk	U	
	- Compute the higher of the two to determine capital charge	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
1.20	The system should be able to compute specific charge based on rating criteria provided by the user and updated from time to time	U	
1.21	The system should be able to differentiate specific charge for both rating criteria and category of issuer	U	
1.22	The system should enable reduction of risk position post netting of collateral for determining specific charge. This should be parameterised by the user.	U	
1.23	The system should aggregate capital charge across all risk categories	U	
1.24	The system should report the market risk capital charge computation in the format prescribed by RBI	U	
1.25	The system should generate the quantitative disclosure report for market risk as required by RBI	U	
1.26	The system should be in a position to simulate the impact of incremental positions on the market risk capital charge	U	
1.27	The system should be able to compute risk positions in different currencies and perform required capital charge computations by currency	U	
1.28	The system should support the following valuation methodologies:		
	- Mark to market	U	
	- Mark to model	U	
	- Cost to close	U	
1.29	The system should allow for adjusting valuations based on illiquidity premium	U	
1.30	The system should be in a position to adjust valuation decrease caused due to illiquidity premium from the available capital	U	
1.31	The system should be in a position to compute capital charge for delayed settlements based on the multipliers prescribed by RBI	U	
1.32	In case of non-DVP transactions, the market risk system should be in a position to collate overdue settlement beyond 1 day from the treasury system across all asset classes	U	
1.33	In case of non-DVP transactions, the market risk system should be in a position to collate overdue settlement beyond 5 day from the treasury system across all asset classes and reduce the same from the capital	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
2	**Limit Monitoring**		
2.1	The system should allow the user to set the limits based on the notional principal, VaR, risk sensitivity factors, MTM, book value, daily P&L and cumulative P&L for individual scrips as well as the aggregated portfolios	U	
2.2	The system should have the capability of setting and monitoring the following type of product wise limits at the frequency defined along with it:	U	
2.2.1	Fixed Income	U	
	Product wise and Overall Investment Limit (Real-time)	U	
2.2.2	Limits on the size of the proprietary Trading book	U	
2.2.3	Dealer-wise limit	U	
2.2.4	PV01 based limits for Investment (under AFS + HFT)	U	
2.2.5	Short Sale Limits	U	
2.2.6	Deal size limits (Real-time)	U	
2.2.7	Maturity wise limits (Real-time)	U	
2.2.8	Rating-wise limits for rated instruments (Real-time)	U	
2.2.9	Industry / sector wise limits (Real-time)	U	
2.2.10	Portfolio as well as security level stop loss limit (Real Time)	U	
2.2.11	Portfolio as well as security level Cumulative stop loss limit (Real Time)	U	
2.2.12	VaR limit (Preferable near real time but can be at a batch process level)	U	
2.2.13	Equity & Equity MF	U	
	Overall Investment limit (Real-time)	U	
2.2.14	Deal size limit (Real-time)	U	
2.2.15	Scrip-wise limits for Equity (Real-time)	U	
2.2.16	Investment limit for Equity MF (Real-time)	U	
2.2.17	Portfolio as well as scrip level stop loss limit (Real Time)	U	
2.2.18	Portfolio as well as scrip level Cumulative stop loss limit (Real Time)	U	
2.2.19	VaR limit (Preferable near real time but can be at a batch process level).End of day Limit is preferable.	U	
2.2.20	Foreign Exchange and Bullion	U	
	NOOP limit (End of the day)	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
2.2.21	Intraday (Daylight) Position Limits	U	
2.2.22	Overseas Investment Limits	U	
2.2.23	Tolerance Limit	U	
2.2.24	Dealer-wise Open Position Limits	U	
2.2.25	Aggregate gap limit (End of the day)	U	
2.2.26	Deal size limits(for different products) (Real-time basis)	U	
2.2.27	Portfolio as well as currency level stop loss limit (Real Time)	U	
2.2.28	Portfolio as well as currency level Cumulative stop loss limit (Real Time)	U	
2.2.29	VaR limit (Preferable near real time but can be at a batch process level)	U	
2.2.30	Gold overnight position limit (real time)	U	
2.2.31	Derivatives	U	
	Deal Size limits (Real Time)	U	
2.2.32	Greek limits for options	U	
2.2.33	Delta limits (Real time)	U	
2.2.34	Overall Gamma (Real Time)	U	
2.2.35	Gamma beyond 3 day (Real Time)	U	
2.2.36	Vega (Real Time)	U	
2.2.37	Rho (Real Time)	U	
2.2.38	Phi (Real Time)	U	
2.2.39	Maturity segment wise PV01 limits for interest rate derivatives	U	
2.2.40	Stop loss limit (Real Time)	U	
2.2.40 A	Take Profit limit (Real Time)	U	
2.2.41	Cumulative stop loss limit (Real Time)	U	
2.2.42	VaR limit (Preferable near real time but can be at a batch process level)	U	
2.2.43	IRS and FRA Exposure limits (Net Open Position)	U	
2.2.44	Currency Options / Futures / Swaps – Foreign Currency : Exposure Limits (Gross Open Position)	U	
2.2.45	Rupee Options : Exposure Limits (Gross Open Position)	U	
2.2.46	Interest Rate Swaps / Forward Rate Agreements / Futures – Rupee : Exposure limits (Net Open Position)	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
2.2.47	Counter party limits	U	
2.2.48	Liquid mutual fund;-Regulatory limit, external minimum rating for MF Per Fund house limit Portfolio as well as scrip limit VaR limit etc	U	
2.2.49	Liquid mutual fund;-Regulatory limit, external minimum rating for MF Per Fund house limit Portfolio as well as scrip limit VaR limit etc	U	
2.3	The system should have the functionality where dealers are able to view the current limit utilization as well as the impact on limit utilization of a deal on a pre-deal basis of Various Risk parameters including Deal wise VaR.	U	
2.4	The system should have the facility of setting trigger levels for the limit breaches (soft limits) where the system will generate alerts once the trigger level is reached to pre-defined users.	U	
2.5	The system should have a process flow built-in for authorization of limit enhancements.	U	
2.6	The System should be able to generate limit breach report as and when the limit breaches happens and send the notification to the pre-defined set of people. All major limits like Noop, Agl, Var, Stop loss and dealer wise positions should be included in the report.	U	
2.7	The system should be able to generate limit utilization report at the end of the day and also for a historical period including any breaches.	U	
2.8	The system should maintain audit trails for any changes in configuration of limits.	U	
2.9	The system should be capable of monitoring VAR based stop loss limits.	U	
2.10	The system should be capable of generating consolidated reports showing exception if any under different risk parameters after making a comparison of actual and limits as defined by the Mid office from time to time	U	
2.11	The system should be capable of monitoring compliance with limits laid down in Policy in respect of liquid investments	U	
2.12	The system should be capable of computing the Beta in respect of different portfolios	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
2.13	The system should be capable of monitoring compliance with Portfolio Beta Limits and M-durartion limits	U	
2.14	The system should be capable of monitoring investments in capital instruments of Financial institutions and Banking sector daily basis as required under Basel III norms	U	
3	**Valuation**		
3.1	Product Coverage		
	The system should be able to perform the pricing as well as MTM valuation of all the products in the Bank's portfolio as well as the products that the Bank may wish to deal in the future. The system should be capable of doing valuation at least on a weekly basis. The list of the products is provided below:	U	
	Foreign Exchange		
	FX Spot-Forwards(including both merchant and inter bank forwards)	U	
	European FX Options	U	
	ET FX Futures	U	
	ET FX Options on Futures	U	
3.2	**Interest Rate**		
	Cash management bills	U	
	Securitisation (Pass through Certificate including investment for meeting priority sector lending targets)	U	
	Call Money	U	
	Repos / Reverse Repos	U	
	Treasury Bills	U	
	Commercial papers	U	
	Certificates of Deposit	U	
	Short Term Notes	U	
	Promissory Notes	U	
	Single Cash flow	U	
	G-Secs	U	
	Fixed Coupon Bonds	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
	Coupon stripping	U	
	Zero Coupon Bonds	U	
	Floating Rate Notes including but not limited to:	U	
	Plain Vanilla	U	
	Structured	U	
	Amortizing	U	
	Averaging	U	
	Capped / Floored	U	
	Callable / Putable	U	
	Inverse Floater (reverse)	U	
	Perpetual	U	
3.3	**Interest rate Derivatives**		
	Forward Rate Agreements (FRAs)	U	
	Interest Rate Swaps (IRS)	U	
	Plain Vanilla	U	
	Cross Currency IR Swaps	U	
	Basis Swaps	U	
	Zero Coupon	U	
	OIS (MTM Calculation using daily reset and compounding)	U	
	Amortizing Swaps & swaps with different fixing and payment frequencies	U	
	Averaging Swaps	U	
	Constant Maturity Swaps	U	
	Interest Rate Swaptions	U	
	Caps, Floors and Collars	U	
	Interest Rate OTC exotic options (indicate which ones)	U	
	Callable / Putable Swaps	U	
	Convertible Bonds/Convertible preference shares	U	
	Dual Currency	U	
	Ex Coupon	U	
	Step-Up / Step-Down	U	
	Interest Rate Strips	U	
	Interest Rate Futures	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
3.4	**Equities**		
	Equity options, futures and swaps	U	
	Warrants	U	
	Equity shares(including Indian Depository receipts (IDR))	U	
	Non-convertible preference shares	U	
	Index options, futures and swaps	U	
	Note:- The system should have flexibility to use market prices of equities published by two or more exchanges and take the lowest price	U	
3.5	**Commodities Options, Futures and Swaps**		
3.6	**Credit Default Swaps**		
3.7	**Generation of Term Structures**		
	The system should be able to define an unlimited number of term structures for a satisfactory coverage of the various markets within a specific currency (libor, bond, swap, etc.)		
	The system should provide multiple yield curve data display for spread comparisons between different markets	U	
	The system should support Yield curves	U	
	-generation from internal fund costing	U	
	-capture external benchmark curves	U	
	The system should provide option to construct and use yield curves using any one of bid, offer or mid-rates	U	
	The system should provide the user with the functionality to choose, assign, combine and link on the term structure the benchmark instruments quoted on the market for:	U	
	Forward Rate Agreements (FRAs)	U	
	Treasury Bills	U	
	Commercial Papers	U	
	Repurchase Agreements	U	
	Interest Rate Futures	U	
	Interest Rate Swaps	U	
	Generic Bonds	U	
	The system should be able to imply the yield curve from FX Spot-Forward structure also	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
	Choose industry standard yield curve bootstrapping types:	U	
	Zero Coupon	U	
	Forwards	U	
	Proprietary	U	
	Chose industry standard interpolation/extrapolation methodologies:	U	
	Linear	U	
	Exponential	U	
	Logarithmic	U	
	Cubic spline	U	
	Proprietary	U	
	The system should accept upload from pre-calculated values from external applications in the form of Vector of Discount Factors	U	
	The system should define/assign separately Discount Yield Curve and Forward Estimation Yield Curve for structured pricing.	U	
	The system should be able to handle negative rates	U	
	The system should allow basic graphical term structures analysis for better understanding of market conditions:	U	
	Based on historical information	U	
	Based on simultaneous curves comparison	U	
3.8	**Volatility Curves Generation:**		
	The system should define an unlimited number of term structures for a satisfactory coverage of the various markets	U	
	Across all currencies	U	
	Across all markets within a specific currency (caps, floors, bond options, swaptions, exchange-traded options, puts and calls)	U	
	Across all Tenors	U	
	Across all strikes to include Term/Moneyness effect (Smile Effect)	U	
	Interest rate volatility structure	U	
	The system should choose, assign and combine on the term structure the benchmark instruments quoted on the market	U	
	Caps	U	
	Floors	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
	Options on Interest Rate Futures	U	
	Swaptions	U	
	Bond Options	U	
	The system should incorporate industry standard calculation methods in volatility curve generation functionality like swaptions volatility Implied from correlations with other markets (caps / floors)	U	
	The system should allow to chose interpolation methodology	U	
	Linear	U	
	Proprietary	U	
	Cubic spline	U	
	The system should upload pre-calculated values from external applications	U	
	Vector of Forward volatilities	U	
	FX volatility Structure	U	
	Chose industry standard interpolation methodology	U	
	Linear	U	
	Proprietary	U	
3.9	**FX Spot-Forward structure:**		
	The system should define an unlimited number of FX structures for a satisfactory coverage of the various markets.	U	
	FX Forward generation functionality:	U	
	Forward premium Quotes from the markets	U	
	FX Forwards implied from Yield Curve structure (Interest Rate Parity)	U	
	Yield Spread curves generation	U	
	The system should define term structure points as a spread over any of the benchmark instruments	U	
	The system should define term structures as a spread over any other interest rate term structure	U	
	The system should incorporate Securities, Equities and Commodities prices	U	
	The system should define for each benchmark instrument all key parameters necessary for correct calculations (i.e. Day Count Basis, Business day Convention, Holiday Conventions, etc.)	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
	The system should be able to extend database model in order to handle new instruments	U	
	The system should configure and customise any instrument parameters at the cash flow level.	U	
	The system should define a new instrument by inheriting the logic of its constituent instruments. The system should reuse existing functionality modules without unnecessary code duplication and user re-definition.	U	
3.10	**Calculation Methods**		
	Foreign Exchange Models (for Spots and Forwards):	U	
	Net Present Value	U	
	Marked To Market (Forward value comparison)	U	
	The system should conform to accrual and other accounting revaluation methodologies:	U	
	Interest Rate Models and Indexes:	U	
	Net Present Value	U	
	Discount Curve	U	
	Forward Estimation Curve	U	
	Index Yield Curve	U	
	Calibration to market	U	
	The system should conform to accrual and other accounting revaluation methodologies	U	
	Fixed Income / Securities	U	
	Marked To Market	U	
	NPV from any yield curve	U	
	Fixed spread over any yield curve	U	
	Fixed spread over Benchmark Bond	U	
	Incorporation of common optionality models	U	
	Marked to Market	U	
	Black – Scholes (BS)	U	
	The system should specify custom / in House pricing models	U	
	System should allow user to over write Fixings and Cash flows, which shall be considered for P&L computation.	U	
	The system should display partial calculations results for reconciliation and model risk analysis	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
3.11	**Factor Sensitivity Analysis**		
	The system should calculate factor sensitivities at trade, position and portfolio level using:	U	
	"Par" Rates shift	U	
	Zero Coupon shift	U	
	First and Second Order Derivatives on NPV	U	
	The system should calculate sensitivities. Including but not limited to:	U	
	Interest Rate Delta:	U	
	Discount Delta (DF sensitivity)	U	
	Forward Delta (Forward rate sensitivity)	U	
	Delta Total	U	
	Interest Rate Gamma:	U	
	Discount Gamma	U	
	Forward Gamma	U	
	Gamma Total	U	
	Vega	U	
	Theta	U	
	Discount Theta	U	
	Option Theta	U	
	FX Spot Sensitivity	U	
	FX Delta	U	
	FX Gamma	U	
	FX Vega	U	
	Rho	U	
	Maturity bucket wise PV01	U	
	Phi	U	
	Vanna	U	
	Volga	U	
	The sensitivity factors should be netted according to the maturity for a portfolio level sensitivity analysis.	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
3.12	**Decision Support Tools**		
	Portfolio optimization	U	
	Benchmarking relative to user defined indices and portfolios	U	
	Determination of Efficient frontier	U	
	Scenario analysis	U	
	What if analysis	U	
	Simulation Tools	U	
	Sensitivity analys	U	
	Hedge Effectiveness Testing	U	
3.13	**Profit & Loss Attribution**		
	The system should decompose P&L into the constituent risk factors responsible for the net portfolio value change:	U	
	IR Delta P&L	U	
	IR Gamma P&L	U	
	FX Vega P&L	U	
	IR Vega P&L	U	
	IR Time Decay (Theta)	U	
	Trade events	U	
	New trades	U	
	Amended trades	U	
	Void trades	U	
	The system should display and report Profit & Loss attribution using drill down capabilities	U	
	The system should display and report Profit & Loss attribution using graphic capabilities	U	
	System should allow TMO to over write Fixings and Cash flows, which shall be considered for P&L computation.	U	
4	**VaR Calculation and Back testing**		
4.1	The system should be able to use the extracted position data and market data	U	
4.2	The system should give the user the flexibility to choose the risk factors applicable to compute VaR	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.3	The system should be able to retrieve historical data of the risk factors based on the user-defined holding period.	U	
4.4	The system should be able to calculate VaR using parametric approach, delta-gamma approach, variance-Co-variance method, Monte-Carlo approach and Historical simulation methods.	U	
4.5	The system should be able to calculate parametric VaR using industry standard Risk Metrics methodology.	U	
4.6	The system should estimate VaR for Non-Gaussian risk	U	
4.7	The system should be able to calculate volatilities using relative price changes, absolute price changes and logarithmic price changes	U	
4.8	The system should allow applying different volatility estimators and models: moving averages, exponential with definition of Decay Factor, GARCH & Stochastic Volatility estimates.	U	
4.9	The system should have the ability to calculate correlation using historical data and have the flexibility to set parameters to incorporate volatilities and correlation data from external source.	U	
4.10	The system should allow user-defined confidence intervals and holding periods as well as decay factor for historical valuation method	U	
4.11	The system should calculate Undiversified / Diversified / Partially Diversified VaR to allow for risk factors correlations contribution.	U	
4.12	The system should allow inclusion/exclusion of gamma and Vega factor sensitivities for linear transactions and optionality	U	
4.13	The system should perform calculations in "Real Time" or "Near Real Time" and batch basis	U	
4.14	The system should calculate and store the various components of VaR for further drill down reporting capacity	U	
4.15	For historical simulation, the system should support variants of Full Valuation for performance issue enhancements	U	
4.16	For Monte-Carlo approach, the system should have an accurate and sizeable (50000 numbers minimum) random number generator algorithm which can support multiple probability distributions	U	
4.17	The system should include standard processing methodologies for run time performance enhancement, (e.g. Distributed / parallel processing)	U	
4.18	The system should provide variance reduction techniques	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.19	The system should provide for multi-process Monte-Carlo processes (i.e. to define the length of Monte Carlo steps, the mean reversion and standard deviation for the models used to describe risk factors relationships)	U	
4.20	The system should display Monte Carlo price paths leading to losses greater than a certain amount (user definable) in order to provide a better understanding / interpretation of the market conditions that could generate such losses.	U	
4.21	For incremental VaR, there is a need for a system that approximates VaR in an additive form without recalculation of the complete firm-wide portfolio. (for intra-day calculation)	U	
4.22	The system should have the functionality to compute transaction level (Component) VaR	U	
4.23	The system should have functionality to aggregate VaR at any hierarchy level	U	
4.24	The system should perform incremental calculations in real time	U	
4.25	The system should have open architecture to allow link to external proprietary VaR engines.	U	
4.26	The system should allow user-defined scenarios to override-adjust historical pattern assumptions (e.g. special events)	U	
4.27	Allow combination of analytical and simulation methods based on product type for performance enhancement	U	
4.28	The system should allow combination of analytical and simulation methods based on product type for performance enhancement	U	
4.29	The system should select interval periods for comparing P&L and VaR (at least for 252 trading days)	U	
4.30	The system should test parameters by simulating VaR on historical portfolios and/or rates	U	
4.31	The system should be able to generate exception reports.	U	
4.32	The system should be able to classify the number of exceptions in green, yellow and red zones as defined by the RBI and generate a report on that.	U	
4.33	The system should be capable of computing VaR in respect of all financial instruments dealt by bank presently and in future	U	
4.34	The system should be capable of defining VaR reporting hierarchy like Treasury VaR, Asset Class VaR, Portfolio VaR,Portfolio Asset class VaR, Instrument VaR and Component VaR	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.35	The system should be capable of computing VaR in respect of equity positions and interest rate sensitive positions(including those interest rate sensitive positions which has credit risk)	U	
4.36	The VAR models in the system should be capable of combined VaR in respect of specific and general market risks for equity positions. Further it should be able to isolate the VaR for each component so as to enable its back testing and day to day risk management	U	
4.37	In case of interest rate sensitive positions which has credit risks, the system should be able to compute Incremental risk charge for default and migration risks , which are generally not captured by the VaR model. Alternatively these risks may be factored in the VaR model in a sensible manner	U	
4.38	The system should be capable of computing and displaying the VaR measures which are denominated in INR.	U	
4.39	The system should be flexible in choosing the historical observation period and different methodologies for computation of VaR	U	
4.40	The system should facilitate frequent update of data sets in a flexible and convenient maner	U	
4.41	The system should have sufficient statistical tools to test the accuracy of VaR models	U	
4.42	The system should accommodate the application/usage of different VaR models for different asset classes	U	
4.43	In case of non- linear portfolio, which do not have identical and independent normally distributed returns, VaR models should not use square root rule to scale up VaR numbers	U	
4.44	The system should be capable of incorporating risk factors used in pricing model into the VaR Model	U	
4.45	The VAR models should capture the Basis risk and correlation risk	U	
4.46	The system should facilitate the risk adjusted performance measurement based on VaR	U	
4.47	The system should have utilities to mitigate model risks that may surface subsequently or incorrect application	U	
4.48	The system should be capable of computing liquidity adjusted VaR	U	
4.49	The system should Back-Test the portfolio value change excluding / including new, voided, amended trades	U	
4.50	The system should be capable of performing back testing on actual as well as hypothetical P&L.	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.51	The system should be capable of performing back testing on dirty as well as clean (minus brokerage, commission etc.) P&L.	U	
4.52	The system should have the functionality to perform sub-portfolio level back testing.	U	
4.53	The system should have the functionality to perform back testing for multiple confidence intervals.	U	
4.54	The system should store the historical back testing exceptions for at least 3 years.	U	
4.55	**Back testing: specific risk**		
	The system should have the capability to run the goodness of fit test for fitting distribution as suggested by RBI and industry practices.	U	
4.56	The model should be able to capture concentrations (magnitude and changes in composition) in specific sectors and counterparties.	U	
4.57	**Incremental risk charge (IRC)**		
	The IRC model in the system should appropriately reflect the issuer and market concentration, concentration within and across product classes	U	
4.58	The system should use Multi-period model to compute incremental risk, and it should be capable of evaluating implied correlations	U	
4.59	The system supports indirect methods of testing IRC model including at the minimum stress testing, sensitivity analysis and scenario analysis to assess qualititative and quatitative reasonableness	U	
5	**Stress Testing**		
5.1	The system should allow the user to define multiple portfolios and assign exposures to each portfolio.	U	
5.2	The user should be able to define multiple stress testing scenarios for each portfolio	U	
5.3	The system should allow users to save the stress testing scenarios defined.	U	
5.4	The user should have the entire list of scenarios defined available for him to select the desired scenario for each portfolio at run-time.	U	
5.5	The system should allow the user to define multiple risk factors for each stress test scenario, depending on the nature of the portfolio.	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5.6	The system should be able to upload multiple scenarios directly from excel/csv files	U	
5.7	The system should have the ability to determine the correlation between risk factors based on historic data	U	
5.8	The system should have the ability to accept correlation information as user defined parameters	U	
5.9	The system should have the ability to conduct stress testing covering General scenarios (for entire trading book) and Portfolio specific scenarios using single or combination of risk factors.	U	
5.10	The system should be capable of accepting risk factor shifts on:	U	
	Single term structure	U	
	Two or more term structure modelling relationships such as correlations between curves and auto correlation , FX interest rate parity etc.	U	
	Two or more term structure assuming no correlations	U	
5.11	At a minimum, the system should support stress testing based on shifts in the following risk factors:		
	Yield curves (Parallel Shifts, Non Parallel Shifts, Changes in the convexity of the curves & Changes in Basis)	U	
	Volatility curves	U	
	FX – Spot	U	
	FX – Forward structure	U	
	FX Volatility	U	
	Commodity curves	U	
	Equity Indices	U	
	Change in correlation and change in Distribution shall also be included.	U	
5.12	The system should be capable of accepting the following calculation parameters from the user:		
	Spreads over benchmark curves and between market curves.	U	
	Volatilities and correlations	U	
5.13	The system should have the capability to execute multiple scenarios together and determine the combined effects on the portfolio.	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5.14	The system should be capable of accepting risk factor shifts in the form of:		
	Absolute figures	U	
	Percentages	U	
	Custom expressions	U	
5.15	The system should have the capability to display the stress test results in tabular form as well as graphical form	U	
5.16	The system should have the capability to accept stress test limits at the following granularities:		
	Complete trading book level	U	
	Portfolio level	U	
5.17	The system should have the ability to raise exceptions in the event of a breach of stress testing limits	U	
5.18	The user should have the ability to schedule stress tests in the system and for report generation of the stress test results.	U	
5.19	The system should have the ability to create reports in a web-based dashboard formats to enable senior management to access such reports remotely.	U	
5.20	The system should accommodate testing of probabilistic , historical as well as hypothetical scenarios(including macro-economic scenarios)	U	
5.21	The system should be flexible to input and use historical data for specified period and specified multiple sets of data for e.g 2007-2008 for computing stressed VaR.	U	
5.22	The stress testing utility of system should be capable of addressing recovery rate uncertainty implied correlation and skew risk and other risk factors that are not captured in VaR model.	U	
5.23	The system should be capable of using Monte- Carlo simulation in assessing the stress testing shocks to be applied. Besides, while performing the Monte- Carlo simulation the system should be capable of considering the anti-thetic data (i.e model should consider changes that are based on the magnitude of historical price movements, applied in both directions- irrespective of the direction of the historic movement.)	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5.24	The model should be capable of assessing and applying shocks of the magnitude experienced elsewhere although the bank was not exposed to such scenario; provides the information on such scenarios are previously feeded into the system	U	
6	**Internal and Regulatory Reporting**		
6.1	The system should produce screen and print level reports within flexible user defined hierarchies and business unit aggregation rules	U	
6.2	At a minimum the following reports should be produced		
	Control Reports	U	
	Transaction inventory reports	U	
	Open Position reports based on any hierarchy level and any transaction/computed values	U	
6.3	Risk Reports	U	
	Produce position reports for various parameters: delta, gamma, vega, theta, etc. based on internal hierarchy or sub-portfolios/ trades.	U	
	Product limits and gaps reports based on risk parameters.	U	
	VaR reports disaggregated into various risk components (regulatory requirement)	U	
	Simulation/stress testing reports (with drill-down capability)	U	
	Portfolio Analysis	U	
6.4	The system should generate reports using any stored historical data	U	
6.5	The system should have a report writer where user may define the content and format of any new reports.	U	
6.6	**Profit & Loss Reporting**		
	The system should produce profit & loss report based on the net present value approach, accruals and other accounting methodologies, etc. for any defined portfolio with drill down capabilities to a transaction level	U	
6.7	The system should include in profit & loss calculations: transaction costs (brokerage fees, commissions, and other deal costs attached to the instrument cash flow structure)	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6.8	The system should also have the capability of cleaning the MTM (removing transaction costs) for the purpose of back testing.	U	
6.9	The system should calculate and display profit & loss results in local currency, base currency, reference currency and any other user's currency.	U	
6.10	The system should calculate and display profit & loss by year-to-date, month-to-date, or any other two dates/periods real time or using historic data.	U	
6.11	The system should produce graphical representation of profit & loss results	U	
6.12	**Drill Down Functionality**		
	The system should aggregate / breakdown information at any level based on static information (i.e. trades attributes). Including but not limited to:	U	
	Currency	U	
	Counterparty	U	
	Instrument type	U	
	Book	U	
	Trader	U	
	User-definable attribute	U	
6.13	The system should aggregate / breakdown information at any level based on dynamic Information (results categories) including but not limited to:		
	NPV	U	
	Delta	U	
	VaR	U	
6.14	The system should aggregate / breakdown any combination of static and dynamic information.	U	
6.15	The system should display results in a Multi-dimensional format (e.g. Excel Pivot Tables)	U	
6.16	Reporting Requirements - IMA		
	The System should provide complete qualitative and quantitative disclosures required for IMA approval.	U	
6.17	High, mean and low VaR values over the reporting period and period – end;	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6.18	High, mean and low stressed VaR values over the reporting period and period – end;	U	
6.19	The System should provide Back Testing Exception reports	U	
6.20	Reporting Requirements - Internal	U	
	The system should generate reports on:	U	
	Duration, M.Duration, Convexity, VaR, PV01, PVBP	U	
	Investment Operations	U	
	Summary of Banks aggregate exposures like Duration, Modified Duration/VaR, Mismatches, Forex VaR etc.	U	
	Mark to Market Reports of Investment Portfolio, Foreign Currency Portfolio, Derivatives Position	U	
	In addition to the above the system should generate following reports	U	
	Stress testing Reports	U	
6.21	Limit Exceptions Reports	U	
6.22	Market Risk Report	U	
6.23	Mark to Market Reports (Investments/Forex/ Commodities)	U	
6.24	Report on Duration, M-Duration, VaR (Investment Portfolio-wise)	U	
6.25	Currency-wise forex GAP Reports (IGL/AGL)	U	
6.26	Market Analysis Report (Volatility/Trends and other risk indicators)	U	
6.27	Market Scenario/Strategy (Based on volatilities, correlations)	U	
6.28	Open Position Report for Precious Metals	U	
6.29	Risk Limit Tracking	U	
6.30	VaR Reports (Forex/Domestic Treasury/ALM)	U	
6.31	Report on assessment of Risk adjusted Earnings (RAROC)	U	
7	**Capital Computation**		
7.1	The System should be able to calculate market risk regulatory capital under IMA consisting of the following two components, based on VaR measure: General Market Risk Charge; and b) Specific Risk Charge [including Default Risk, Credit Migration Risk, Credit Spread Risk, Incremental Risk etc. In addition, the sytem should compute capital based on the VaR ,and Stressed VaR numbers on a daily basis according to the framework defined by RBI.	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
7.2	The user should be able to define certain portfolios where capital will be entered manually. However entry of capital manually should be an exception rather than a rule.	U	
7.3	The system should have the functionality to define the RBI allowed multiplication factor as a default.	U	
7.4	The multiplication factors should be user defined.	U	
7.5	The system should be able to calculate capital for different asset classes as defined by the user as well as for the aggregate Bank portfolio.	U	
7.6	The system should be able to attribute the movement in capital to a risk factor level.	U	
7.7	The system should be able to decompose the capital and attribute it to various asset classes. It should be able to perform simulation where by changing the composition of the portfolio, change in capital should be calculated.	U	
7.8	The system should be able to generate a report as per RBI format for reporting of the Capital.	U	
8	**Computation of Credit Value adjustment**		
8.1	The system should be able to access the position data (OTC Derivatives) and market data stored in the table structure.	U	
8.2	The system should segregate position data obtained from the treasury system counterparty wise.	U	
8.3	The system should interface with the Core Banking System to obtain counterparty wise collateral information and other exposure mitigates such as margining.	U	
8.4	The system should be able to perform MTM valuations in all the asset class viz., interest rate, equity, FX, credit and commodities for the existing portfolio of the bank.	U	
8.5	The system should be able to apply credit mitigates under a netting set (i.e. netting, collateral, etc.)	U	
8.6	The system should be able to interface with the credit risk system / core banking system to obtain the rating for all the counterparties.	U	
8.7	The system should be able to extract the tenor-wise PD/LGD data from the credit risk system / core banking system or calculate it based on credit spreads of the counterparties	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
8.8	The system should follow distributed processing to reduce calculation time	U	
8.9	The system should be able to attribute the CVA for counterparty to instrument level.	U	
8.10	System should provide ability to compute Credit Value Adjustment (CVA) as prescribed by RBI in Basel-III guidelines.	U	
8.11	The system should be capable of arriving at the Exposure at default and compute capital risk charge using Current Exposure method at trade level as well as counterparty level	U	
8.12	The system should be able to classify trading positions into Interest rate and FX as advised by RBI	U	
8.13	The system should be able to apply the standard credit conversion factors as prescribed by the RBI	U	
8.14	System should provide ability to compute CVA on marginal basis and standalone basis at trade level and portfolio levels	U	
9	**Control specification for the system**		
9.1	The system should have interface level controls for data extracted from the treasury/ market risk system	U	
9.2	The system should allow for three levels of access:		
	- User administration access to parameterize the model	U	
	- IT administrator access to configure screen level rights	U	
	- GUI to review and view output from the system	U	
9.3	The system should maintain an audit trail for data override functions used	U	
9.4	Deviations in output from VaR models resulting from changing default configurations should be logged by the system	U	
9.5	In case of plug and play models used for VaR computation, the system should allow for the same level of operational control as in-built models	U	
9.6	Limits parameterized within the system should have auto-triggers and auto-mailers to inform people specified within the user hierarchy	U	
9.7	Pre-limit warning functions should be embedded with the system	U	
9.8	Report on reconciliation showing difference in valuation between treasury and market risk system if any should be generated in the market risk system	U	

Sl. No	Market Risk Functional Requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
9.9	Access to data tables within the system should be possible only from pre-defined interfaces or user entry screens. Ability to write to data tables by manual input at an interface level is not acceptable.	U	
9.10	Where RBI permits for reports to be uploaded to OSMOS, the system be able to provide such an upload functionality	U	
10	**Other functional requirements**		
10.1	System should facilitate establishing a relationship between certain Credit and Market risk drivers (such as Exposure amount / NPA % / PD % / VaR, etc) to changes in macro-economic factors (such as GDP / Inflation / Interest rates, etc) using statistical techniques such as regression	U	
10.2	The system should be capable to model the Yield curve using minimum of six risk factors to capture interest rate risk.	U	
10.3	System should be able to divide the yield curves of, at a minimum, the major currencies and markets into a minimum of six maturity segments	U	
10.4	System should have an option whereby regulator/internal auditor is able to see all the underlying data, trace its origins and understand how the risk models work with other systems within the bank	U	
10.5	The system should be able to interface with FTP system	U	
10.6	The system should have the pre-built templates and should also have the functionality for a business user to define and customize Market Risk MIS across all matrix dimensions such as:		
	Counter-party	U	
	Portfolio	U	
	Product	U	
	Geography – country/ state/	U	
	Sectoral Concentrations	U	
	Risk Profiles	U	
	Rating wise	U	
	Delinquency buckets	U	

Operational Risk (Functional Requirement) - As per Reserve Bank of India

Note :- Kindly choose the status of functionality from the drop down menu

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
1	**Risk & Control Self Assessment (RCSA) as per RBI guidelines**		
1.1	The system should have the features to upload, plan and facilitate, track and report the risk and control self assessment process on a firm-wide basis.	U	
1.2	System should have customized templates for rolling out RCSA across all the operational/ functional/ administrative units. The vendor should assist in customizing the RCSA templates to suit the requirements of the Bank.	U	
1.3	The system should be capable of supporting different RCSA methodologies. The system should support rollout of RCSA using multiple approaches such as top-down, bottom-up, and hybrid as determined by the bank. Methodology may include clustering/ grouping of risk entities by risk profile, geography or any other criteria where each cluster can be treated as as one risk entity.	U	
1.4	The system should have the capability to map the existing Organization Structure to the relevant Business Lines as per Basel-II guidelines.	U	
1.5	Assessment scheduling shall be done through the system as to when RCSA is to be done over defined RCSA period. System should have capabilities of sending auto reminders through emails when the scheduling is due and escalation for delay in completing the assessment to various levels. System should support assigning ownerhsip for each RCSA schedule.	U	
1.6	End users should be able to rate the identified risks and controls	U	
1.7	The system should have the ability to compute residual risk values based on the ratings applied for risks and controls for each process step	U	
1.8	The system should be able to re-run the past assessments based on the revised scale when there is a change in the rating scales	U	
1.9	The system should enable logical structuring of the self assessment scenarios into units, departments and business lines	U	
1.10	The system should be able to aggregate the different ratings and identify outliers. The system should have the capability to automatically communicate the identifed outliers to the respective users for further clarifications through bulk e-mail or other appropriate modes.	U	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
1.11	The system should have the capability to reclassify/categorize the operational risk's as per Basel/RBI Guidelines	**U**	
1.12	The system should have the capability to generate heat maps automatically. The system should have the capability to customize the logic used for creating Heat Maps (preferably through a master user setting)	**U**	
1.13	The system should have a dashboard facility to view the risk profiles by business area, business unit, Basel business category etc	**U**	
1.14	System should have the capability of rolling out RCSA through online (web based) channels	**U**	
1.15	System should have the capability to capture RCSA response planning and tracking the same	**U**	
1.16	The system should be able to follow up for unresolved action points and generate status report for the same.	**U**	
1.17	The system should be able to capture testing results. Risk and controls should be mapped to respective classification such as risk entity, process, product, Basel II classification, causal factors, risk drivers, significant/non significant risk, preventive/detective control, control frequency, risk identification by (auditor/risk entity/IRMD/external events/others) etc.	**U**	
1.18	The system should generate heat maps based on testing results. The same should be compared to initial heat maps to highlight the shift in risk levels.	**U**	
1.19	The system should be able to generate test plan based upon timelines in action points	**U**	
1.20	The system should have the capability to upload the existing RCSA data with the Bank	**U**	
1.21	Vendor should conduct a sample run of the entire RCSA exercise as per the process mentioned by the Bank and Vendor should extend assistance in customizing various reports and MIS	**U**	
1.22	RCSA template must have the facility for creation of risk and control library. It should have flexibility to enter any risks identified and corresponding controls in all the operations and activities of the bank including in the support functions. Risk and controls so identified should be stored in the risk and control data library.	**U**	
1.23	Risk and Controls in the RCSA template should come from the Risk and Control Library to avoid repetitive preparation of templates	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
2	**Loss Data**		
2.1	The system should have the capability to capture operational losses as per the threshold decided by the Bank. The loss capturing template should be customisable for different stages of the workflow.	**U**	
2.2	The format used for capturing operational risk losses should be customizable by the Bank. The system should have download and upload facility for loss risk events in a specified template.	**U**	
2.3	The system should have dashboard facility to view the loss event in different impact bucket by business area	**U**	
2.4	System should have facility to capture near-miss events, gains arising from operational risk loss event and opportunity cost.	**U**	
2.5	System to have the capability to request for and track the reporting of data from pre-defined responsible personnel at predefined frequencies	**U**	
2.6	System should be able to escalate losses to the authorized personnel above a set threshold. A master user setting should facilitate the input of the escalation structure.	**U**	
2.7	The system should have a methodology to classify losses as per Basel loss events, Classification logic should be customizable.	**U**	
2.8	The system should be able to generate an 8X7 matrix of loss events and business lines. And model the operational loss distribution for the entire 56 operational risk cell.	**U**	
2.9	The system should have the facility to customize/map loss data reports as per the Bank's needs. Loss information should include type of valuation such as book value, replacement cost, Mark to Mark (MTM) etc. Vendor should be able to link various source system and report servers with loss modules for automation of certain types of loss capture and under reporting analysis.	**U**	
2.10	The system should be able to do scaling, judgment overrides or other adjustments to the loss estimates.	**U**	
2.11	Information with respect to risk event should be captured such as date of risk event occurrence, event end date, date of discovery, date of providing contingent liability, date of accounting / provisioning, description of risk event, location, product, process, risk entity, root-cause analysis (RCA), causal factors, risk drivers, mapping with business line and loss event type as per Basel II classification, bank's internal classification etc.	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
2.12	System should flag events as loss event, near-miss, external loss data, operational gain and opportunity cost for distinct identification of each entry. It should enable identification of related loss events over time i.e. grouping of related loss events over a period of time.	**U**	
2.13	The system should have the capability to record recoveries and the category of recoveries e.g. insurance. There must also be the ability to add or customize categories and also to customize the recovery recording workflow as per the Bank's needs.	**U**	
2.14	The system should have facility to arrive at the Gross Loss inter alia including any direct charges to reserves due to operational losses, all expenses incurred as a consequence of operational risk events, provisions made, penalty and fines etc.	**U**	
2.15	System should have the ability to identify and approve "boundary issues" i.e. Credit Risk and Market Risk related losses as per the logic provided by the Bank.	**U**	
2.16	System should also facilitate, where relevant, the use of external data to enhance scenario analysis, fit severity distributions or benchmark operational risk exposure results.	**U**	
2.17	The external loss data points in the external loss database should have the following data points,		
	1. Loss information	**U**	
	2. Description	**U**	
	3. Supplementary analytic data (balance sheet size, revenue, etc)	**U**	
	4. Classification as per Basel-II standards	**U**	
2.18	External loss data from all sources e.g. public data / pooled industry data / vendor data, should be supported by the system. System should be able to do scaling, adjustments (qualitative as well as quantitative). The scaling process should be systematic, statistically tested and generate outcome consistent with the operational risk profile of the bank.	**U**	
2.19	System should facilitate validation of loss data through multiple levels of reviews and approvals e.g. maker-checker and there can be more than one level of review and approval.	**U**	
2.20	System should facilitate reconciliation of loss data with other source data such as GL entries etc.	**U**	
2.21	Proposed solution should provide facility to seamlessly upload/ download data to and from the Loss Data Exchange (CORDEX) setup by Indian Banks Association (IBA)	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
3	**KRI (Key Risk Indicator)**		
3.1	System should enable the authorized users to create new KRIs and edit as well as map existing KRIs. The system should also be capable to interface with multi data source systems (such as CBS, RBIA etc.) and extract the data from the same in an automated manner.	**U**	
3.2	The system should enable users to upload plan and facilitate tracking and reporting on a firm-wide basis of the KRI process.	**U**	
3.3	Definition of KRI with its mapping with various dimensions and classifications e.g. KRI name, description, mapping with process, activity, product, risk entity, risk event type classification, unit of measurement, calculation criteria, data attributes etc.	**U**	
3.4	The system should allow assignment of accountability to each KRI and list out underlying common risk factors for the KRIs and should also be capable of estimating/quantifying loss events based on the scenarios for underlying risk factors.	**U**	
3.5	The system should have the ability to take values from different users and consolidate them at various levels such as business function, location and business line.	**U**	
3.6	The system should be able to generate a dashboard, generate reports and analyze trends based on logic approved by the Bank.	**U**	
3.7	The system should allow setting up KRI specific tolerance threshold limits. The system should provide for email/SMS alerts whenever KRI values breach the acceptable threshold limits set for them.	**U**	
3.8	System should cull out continuous red (high risk) and amber (medium risk) indicators and automatically intimate the person responsible for that KRI.	**U**	
3.9	The system should allow setting of different monitoring frequencies (weekly, monthly etc.) for each KRI.	**U**	
3.10	The system should record, suggest and monitor action points arising out of red and amber indicators with agreed timelines. Action plan should include information such as task to be done, original target date, revised target date, number of revisions done in the target date, owner for action plan, link with the respective risk event etc.	**U**	
3.11	The system should be able to follow up (as per escalation matrix) for unresolved action points and generate status report for the same	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
3.12	The system should allow reassessment of indicators and thresholds.	**U**	
3.13	The system should have an algorithm for converting KRI data monitored across branches, units, geographies into risk scores. The algorithm should also provide for aggregating risk scores across business lines, geographies, branches and provide risk scores at different levels for comparison	**U**	
3.14	The vendor should extend assistance by conducting a sample run of the KRI process as per the Bank specified process.	**U**	
3.15	The vendor should extend assistance in customizing various reports and MIS	**U**	
3.16	System should create a KRI Database which would store the Defined KRIs, which can be used to assign KRI to various risk	**U**	
4	**Business Line Mapping & Capital Computation under TSA**		
4.1	The system should have the capability to map the existing Organization Structure to the relevant Business Line as per Basel-II guidelines on TSA.	**U**	
4.2	System should be able to map all activities of the bank into the eight level 1 business lines in a mutually exclusive and jointly exhaustive manner.	**U**	
4.3	The system shall also be capable to map the activities of the bank into level 2 & 3 mapping as envisaged by RBI.	**U**	
4.4	When mapping gross income, if an activity cannot be mapped into a particular business line, then the system should be capable of using an objective mapping criteria in accordance with the Basel II guidelines.	**U**	
4.5	System should be capable of defining the mapping of any new activities or products introduced by the bank.	**U**	
4.6	System should be capable of generating reports as envisaged by management. The bidder should extend assistance in customizing various reports and MIS.	**U**	
4.7	The bidder should also extend assistance by conducting a sample run of the Business Line mapping process as per the Bank specified process.	**U**	
4.8	System should allow the user to extract the data based on applied filters e.g. Gross Income mapping for a particular period.	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.9	System should be able to compute gross income for different business lines as per Basel II / RBI guidelines for TSA, by interacting with data warehouse or other source systems.	**U**	
4.10	System should incorporate validation checks such as reconciliation of income as per GL/FS with income considered for capital computation.	**U**	
4.11	System should be able to store documentation containing the rationale for mapping of Income codes appearing in GL.	**U**	
4.12	System should be able to calculate the operational risk capital as per RBI's TSA guidelines by applying the Beta % prescribed by RBI for each Business line.	**U**	
5	**Scenario Analysis & BEICFs**		
5.1	Systems should facilitate scenario analysis of expert opinion to evaluate its exposure to high-severity loss events e.g. including macro-economic scenarios for calculation of operational risk capital and for operational risk management.	**U**	
5.2	The system should support development of scenario related models under the scenario based approach.	**U**	
5.3	System should facilitate use of assumptions in scenario analysis based on empirical evidence.	**U**	
5.4	System should also facilitate review and validation of scenarios.	**U**	
5.5	Solution should provide various methods for the identification and assessment of Business environment and internal control factors and combining results thereof by using bank's existing operational risk management framework and its implementation results such as RCSA (Risk and Control Self-assessment) results, KRI results and Audit Review findings, etc.	**U**	
5.6	Solution should support flexibility for use of BEICF directly or indirectly in the capital calculation process :	**U**	
	as upward / downward adjustment to operational risk capital	**U**	
	indirect input to the scenario analysis process	**U**	
	Solution should have capability of calculation of capital before and after consideration of BEICF factors.	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6	**Capital Computation - Standardized Approach and AMA**		
6.1	System should be able to compute gross income for different business lines as per RBI/Basel guidelines or any other alternate classification.	**U**	
6.2	The system should be able to capture loss scenarios and map loss events and business lines on the basis of low frequency high severity (LFHS), high frequency low severity (HFLS), low frequency low severity (LFLS), high frequency high severity (HFHS).	**U**	
6.3	The system should be able to generate a 8X7 matrix of losses and business	**U**	
6.4	The system should allow the user to fit various frequency distributions, including Poisson, Binomial, Negative Binomial and any other distribution suggested/accepted by RBI. The system should be able to provide graphical outputs for the fitted distribution. Vendor should independently develop and validate the distributions using statistical tools.	**U**	
6.5	The system should allow the user to fit various severity distributions, including Normal, Log normal, Pareto, Weibull, Beta, Gamma, Inverse Gaussian, Extreme Value Theory and any other distribution suggested/accepted by RBI. The system should be able to provide graphical outputs for the fitted distribution. Vendor should independently develop and validate the distributions using statistical tools.	**U**	
6.6	System should have capability to integrate all the data elements viz. external loss data, internal loss data, scenario data, business environment and internal control factors and generate capital numbers. Vendor should be able to provide the logic of usage/ combination of the above data elements.	**U**	
6.7	The system should have the capability to run the goodness of fit test for fitting distribution as suggested by RBI and industry leading practices. Vendor should have the capability to run the goodness of fit test.	**U**	
6.8	The system should identify the relationship between losses and the provided drivers based on various regression techniques and the system should rank the provided drivers against the loss event categories based on the best fit computation of the identified relationship parameters.	**U**	
6.9	The system should allow user to define scaling methodology for losses at each cell based on the above relationship	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6.10	The system should support Monte Carlo simulation for combination of frequency and severity distribution. Vendor should be able to provide the logic for combination of frequency and severity distribution through Monte carlo simulation	**U**	
6.11	The system should support Extreme Value theory for fat tail events (Low frequency high severity -LFHS). Vendor should be able to develop operational VAR for LFHS events using Extreme value theory	**U**	
6.12	The system should have a functionality to combine frequency and severity distributions via statistical techniques to form a total loss distribution for each loss type/business line combination. Vendor should independently develop and validate the mixing of frequency and severity distribution using statistical tools.	**U**	
6.13	The system should have advanced analytics functions such as: system capability to extrapolate from the distribution of observed total loss points curve to determine the likely amount of total losses, etc. Vendor should be able to carry out Advanced analytics function.	**U**	
6.14	The system should support development of scenario related models under the scenario approach. System should support identification/generation of scenarios and their consequent analysis based on inputs received from Internal Loss Data, Relevant External Loss Data and Business Environment and Internal Control Factors (BEICFs) in line with the RBI AMA guidelines.	**U**	
6.15	The system should have advanced analytics functions such as: system capability to carry out structured stress testing, factor the impact of BEICF effect, extrapolate from the distribution of observed total loss points curve to determine the likely amount of total losses, etc.	**U**	
6.16	System should support administration and facilitation of the templates designed for respective assessors for various risk types and business lines. The templates should be customizable	**U**	
6.17	The system should generate VAR for each scenario as well as aggregated VAR at Business line level and Bank wide level. Vendor should independently develop and validate the VAR measures using statistical tools.	**U**	
6.18	The system should fit various distributions based on pre set criteria for each Scenario. Vendor should be able to fit the frequency/ severity distributions, generate scenario based on Var and link the Var number to the number derived from internal loss data.	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6.19	The system should objectively combine LDA data / RCSA data with Scenario data to arrive at Bank wide capital	**U**	
6.20	The system should enable the user to define rules for combination of LDA data/ RCSA data and Scenario data	**U**	
6.21	System should support the risk Var measure to reflect various confidence levels e.g. 95%, 99.9% etc. Vendor should independently develop and validate VAR using statistical tools.	**U**	
6.22	The system should be able to adjust capital based on RCSA /KRI / other quality index and the system should identify the relationship and carry out sensitivity analysis between RCSA / KRI / other quality index	**U**	
6.23	System should enable validation of any parameters (loss rates, risk indicators, scale indicators etc.) used in the system to ensure that the inputs to the regulatory capital charge are reliable e.g. capability to allow the user to run sensitivity analysis	**U**	
6.24	System should enable analyst to model operational risk capital charge with and without the impacts of insurance	**U**	
6.25	The system should be able to provide graphical outputs for the fitted distribution.	**U**	
6.26	The system should support matrix multiplication, covariance-variance and copula approaches for the purpose of aggregation of losses at each cell to arrive at bank wide capital. Vendor should independently develop and validate the above approaches using statistical tools.	**U**	
6.27	System should enable capital re-allocation to the business lines based on the above Aggregation	**U**	
6.28	System should support back testing and vendor should be able to carry out back testing specifying the scope and scale of backtesting.	**U**	
6.29	The software should provide bulk data loading facilities to load the data in database.		
	Following is expected to be bulk loaded:		
	· Loss events with financial impacts (losses and recoveries)	**U**	
	· Business structures (business lines, risk categories, causes, management organizations, legal organizations etc.)	**U**	
	· KRI (& RCSA), Scenario data	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6.30	All the processes of the system (including approaches for stress testing) should be Adequately documented for ease of review and verification by the Bank, external parties or by the regulator. Vendor should provide adequate assistance during such reviews. All the documentation of models should include the key assumptions and key sensitivities of the models. Vendor should be able to carry out stress testing	**U**	
6.31	System should have the facility to - define the model input and output ,parameter estimation of each scenario, frequency and severity distribution and its aggregation , calculation of expected and unexpected losses.	**U**	
7	**Process Mapping and Reporting Structures**		
7.1	The system should provide at least 10 dimensions of structures or hierarchies: Basic organization of the information onto any one or more of at least a selection of 10 hierarchy structures. (For example: Business units hierarchy, Process Structure, Product Structure, Risk Library Structures).	**U**	
7.2	System should provide Multi- Hierarchy Structure Management: Multiple hierarchies or structures permit data to be viewed and managed across more than one dimension with adequate access and edit permissions as specified by the Bank.	**U**	
7.3	System should facilitate split, change, merge, edit and creation of units and codified data points. For example, with business changes there should be the ability to split or merge loss and risk data/MIS.	**U**	
7.4	System should have the capability to maintain inventory of processes and reports at least for seven years	**U**	
7.5	System should support the break-down of processes into logical process steps with linkages to underlying procedures, unit responsibility and they should be able to be linked to RCSA, KRI and Loss event	**U**	
8	**Verification & Validation of processes**		
8.1	The system should have the capability to implement a Bank defined verification & validation process and should fulfill all audit and compliance requirements.	**U**	
8.2	The system should be able to intake the process flow as mentioned by the Bank	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
8.3	As per the process flow, the system should have the capability to initiate the verification & validation process and track the progress of various process steps as per the timelines provided by the Bank	**U**	
8.4	The system as well as the vendor should have the capability to get the operational risk measurement system (ORMS) validated by independent third parties to ensure it is compliant with RBI guidelines.	**U**	
8.5	System should provide all the information as may be required for independent review of Operational Risk Management Framework (ORMF)	**U**	
9	**Risk Reporting**		
9.1	Periodic reports to be generated on loss event types highlighting the findings of RCSA, Audit, Loss, Potential loss and Near Miss data, KRI and Scenarios	**U**	
9.2	The system should be capable of generating performance measurement reports measured vis-a-vis RCSA results, KRI status and action taken by units/business lines. Solution should provide capability for the allocation of capital to business lines, RAPM (Risk Adjusted Performance Measurement) and RAROC (Risk Adjusted Return on Capital).	**U**	
9.3	System should provide linkages between RCSA, KRI, loss data and audit processes as required by the Bank.	**U**	
9.4	The system should provide a drill through heat map. The system should provide drill down reporting.	**U**	
9.5	The operational risk charge before and after any reduction in capital resulting from the use of insurance.	**U**	
9.6	The system should have adequate graphical reporting tools for reporting loss event data	**U**	
9.7	System should support KRI dials for the dashboard reporting	**U**	
9.8	System supports to build various MIS reports Loss matrix, Trend analysis, Issues and action plan status report etc., as per the requirements of the Bank	**U**	
9.9	System should support slice and dice of structure values and filtering of risk areas simultaneously	**U**	

Sl. No	Operational Risk Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
9.10	The system should provide capital charge drill down at each cell level, which would provide a split of LDA VAR and Scenario VAR and from Total Scenario VAR the system should provide drill down to VAR of each Scenario	**U**	
9.11	The system should display capital before diversification and capital after diversification effect and highlight the diversification impact	**U**	
9.12	The system should display capital before BEICF adjustments and capital after BEICF adjustments and highlight the impact of BEICF	**U**	
9.13	The system should aggregate the RCSA scores of risk events to arrive at a Bank wide RCSA profile	**U**	
9.14	The system should generate reports pertaining to outstanding issues and/or action plans emanating from RCSA/KRI/Loss Data Analysis at any given date	**U**	
9.15	The system should generate reports for processes that has loss data but no KRI / RCSA and for processes that have adverse RCSA events but no KRI	**U**	
9.16	The vendor should provide post implementation support, configuration training and enduser training.	**U**	

Integrated Capital Risk (Functional Requirement) - As per Reserve Bank of India

Note :- Kindly choose the status of functionality from the drop down menu

Sl. No	Pillar II, Pillar- III & Basel III & Integrated Capital Computation Module Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
1	**Reporting**		
1.1	A reporting Tool with a presentation layer	U	
1.2	An ETL tool for extraction of capital computed from the four respective systems (CRMS, ORMS, MRMS and ALM/FTP)	U	
2	**Data Model**		
2.1	The solution should provide a single data model to serve as a single repository for all the Market Risk, Credit Risk, Operational Risk, ALM and FTP Solutions	U	
2.2	Provide a Physical Data Model	U	
2.3	Provide the ability to perform data transformation	U	
2.4	Provide the ability to execute the calculation of each of the concerned applications directly from the Data Model	U	
2.5	provide a single framework for the definition of calculation runs across all applications (Market Risk, Credit Risk, Operational Risk, ALM, FTP)	U	
2.6	Provide a single mechanism for batch execution across applications	U	
2.7	provide the ability to trace data calculations across the applications	U	
3	**Capital Planning**		
3.1	System should enable capture of requisite data and for user defined periods for development of the capital plan at the bank and at sub portfolio levels such as but not limited to:	U	
	• Balance sheet and PL estimates	U	
	• Anticipated growth in top line/revenue year on year, profitability margins, costs	U	
	• Increase in risk weighted assets	U	
	• Capital types, amounts, maturity (for non-equity), capital cost.	U	
	• Risk Adjusted performance measures across various business lines and products	U	
3.2	The system should have capital planning and budgeting modules for estimating bank-wide capital for future, stress testing by changing assumptions/ macroeconomic scenarios, allocation across business units, geographies, products etc., if needed.	U	

Sl. No	Pillar II, Pillar- III & Basel III & Integrated Capital Computation Module Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4	**Market Disclosure/Pillar-3 Report (as per RBI guidelines on BASEL II/Basel- III).**		
4.1	The system should generate all reports necessary for complying with Pillar-III of Basel- II/Basel-III norms. These reports include but are not limited to:	U	
	Residual Contractual Maturity Breakdown of the whole portfolio broken down by major type of Credit Exposures	U	
4.2	Exposure -weighted average LGD/EAD for each borrower category.	U	
4.3	Securitization disclosure (Total outstanding exposure securitized by bank broken down by type of securitization (traditional/ Synthetic), exposure type.	U	
4.4	Amount of NPA securitized broken down by exposure type.	U	
4.5	Securitization exposure retained/purchased broken down by exposure type. (This report would be generated for user defined period and as of date).	U	
4.6	Report on capital market exposure as required as per RBI requirement – account wise as per limit and outstanding exposure – on and off balance sheet	U	
4.7	Report on exposure to Real Estate – commercial and residential – direct and indirect	U	
4.8	Report on exposure to commodities	U	
4.9	Report on Interest rate wise break up of advances – segment wise (term loans, project finance, bills purchased/discounted or negotiated, demand loans, CC, staff loans etc) as per user defined range of rate of interest	U	
4.10	Report on Interest rate wise break up of advances – segment wise - as per user defined range of rate of interest	U	
4.11	Report on position of unsecured exposure – public sector/private sector/rating wise/interest rate wise/maturity wise	U	
4.12	Report on break up of term loans, project finance, bills purchased/ discounted or negotiated, demand loans – as per residual maturity	U	
4.13	Report on pre payment of total/ installment of term loans, project finance, bills purchased/discounted or negotiated, demand loans	U	
4.14	Report on segment wise exposure –Report on future draw down schedule for term loans,project finance and infrastructure projects	U	

Sl. No	Pillar II, Pillar- III & Basel III & Integrated Capital Computation Module Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.15	Report on single borrower/group borrower exposure – user defined number of top exposure vis-à-vis prudential exposure limits fixed by bank/regulator	U	
4.16	Rating Wise Distribution of Credit Portfolio Report	U	
4.17	Audit log report	U	
4.18	Overrides performance reports – performance of accounts where there is rating over-ride or downgrades (Branch wise / region wise /geography wise/level wise/approving user wise rating cases processed, approved, rejected and pending for user defined period.	U	
4.19	The system should support portfolio-based calculation like Limits Management: Bank may define a limit cap (may be absolute or % terms) to an industry, borrower, individual exposure, and bank, sovereign, rating. The system would check the same and generate reports. What if/Incremental risk analysis by addition of individual loan portfolio for decision making purpose. Portfolio based calculation should take into account industry correlation to arrive at capital requirement.	U	
4.20	The system should provide facility to generate customized report for user like Top Mgmt, Risk Management Dept, Regional office, Branch Manager, and Relationship Manager etc. Graphical representation of reports, wherever required. Access to certain reports would be restricted to certain groups.	U	
4.21	The solution should have the flexibility of viewing the reports at an aggregated level or at granular level.	U	
4.22	The system should be capable of capturing the distinct elements of Tier-1 and Tier-2 capital under Basel-II/Basel-III norms and it should be able to report total Tier-1 and Tier-II capital at any point of time.	U	
4.23	The system should apply the discount factor in case of subordinated debt based on RBI guidelines and only eligible portion of subordinated debt should be taken as Tier- II capital	U	
4.24	The system should facilitate the regulatory adjustments made to Common equity/ Tier-1/Tier-2 capital under Basel-II/Basel- III norms by appropriately linking with source systems/facilitating manual entry. Examples of such regulatory adjustments are reciprocal cross holdings, unamortized expenditure arising out of second pension option etc.	U	

Sl. No	Pillar II, Pillar- III & Basel III & Integrated Capital Computation Module Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.25	Report on credit, market and operational risk information required for compiling the risk profile template, which is furnished before RBI on a quarterly and annual basis	U	
5	**ICAAP and Pillar 2 Requirements**		
5.1	The system should have a Pillar-II module which supports ICAAP analysis of all material Pillar-II risks of the Bank and do capital computation, for risks like concentration risk (branch wise, RO wise, state wise, industry/ sector wise, product wise, vertical wise rating-grade wise, interest rate-wise, group-wise, borrower-wise etc), reputation risk, strategic risk, compliance risk, underestimation of risk under standardized approach, model risk, liquidity risk, interest rate risk, forex risk etc, as per relevant RBI/ Basel guidelines on Pillar-II.	U	
5.2	The system should perform stress testing for each of the credit, market, interest rate, forex, liquidity, concentration risk on individual basis and aggregate the results of stress testing. The system should at the same time assist in reporting, back testing and assessment of capital for Pillar-II risks including impact on account of stress testing. Additionally, the system should also support aggregation of Pillar-II capital into Bank-wide capital (regulatory & Economic capital) assessed.	U	
5.3	The System should be able to support and have the necessary statistical tools to validate the material risk estimation methodologies and stress testing methods under Pillar-2.	U	
5.4	The system should have capital planning and budgeting modules for estimating bank-wide capital for future, stress testing by changing assumptions/ macro-economic scenarios, allocation across business units, geographies, products etc, if needed.	U	
5.5	The system should be able to generate risk maps, risk charts, reports, trend analysis etc for Pillar- II risks, various risk dashboards for the users and top management.	U	
6	**Basel-III Requirements**		
6.1	The system should have the capability for computation of non-risk based leverage ratio as per RBI/ Basel-III guidelines. The system should have the flexibility to enable reporting and estimation of each capital components like common equity, Additional Tier-1, Tier-2 etc as per prescribed guidelines of RBI under Basel-III. The Pillar-1, Pillar-2 and Pillar-3 modules should be compliant with RBI's Basel-III requirements also.	U	

Sl. No	Pillar II, Pillar- III & Basel III & Integrated Capital Computation Module Functional requirement	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6.2	The system should be capable to compute Liquidity ratios (LCR,NSFR and stock approach ratios) as per Guidelines on Liquidity Management under Basel III	U	
6.3	System should have the capability to compute CVA under Basel-III guidelines.	U	
6.4	The system should be able to compute capital requirement for bank's exposure to central counter parties	U	
7	**Overall Functionality**		
7.1	The solution should have the functionality to extract computed Credit Risk capital numbers, computed Operational Risk capital numbers, computed Market Risk capital numbers, Pillar-II capital numbers if any (e.g. for concentration risk), Pillar-II stress testing capital and Pillar-III capital (if any) from the respective systems/ applications and compute the overall CRAR (Capital to Risk Weighted Assets Ratio) of the Bank for regulatory and internal reporting	U	

ALM Risk (Functional Requirement) - As per Reserve Bank of India

Note :- Kindly choose the status of functionality from the drop down menu

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
1	**Computation Requirements**		
1.1	generate cash flows for all assets and liabilities with or without embedded optionality, by utilizing market or internal data, or by means of behavioral analysis as appropriate	U	
1.2	bucket each on- and off-balance sheet asset and liability in line with extant RBI guidelines for SLS, Interest Rate Sensitivity – TGA and Interest Rate Sensitivity – DGA. Also allow user to define custom buckets for additional analysis.	U	
1.3	compute coupon, yield for each bucket and the macaulay duration, modified duration and modified convexity as applicable to each on- and off-balance sheet asset and liability in line with RBI guidelines on DGA computation, incorporating data from market sources as well as bank internal sources	U	
1.4	evaluate the bank's position with respect to various duration, maturity-mismatch and any other limits established in the system by the Bank to monitor ALM position across geographies, portfolios and jurisdictions	U	
1.5	generate automated threshold alerts and drill-down reports on any breaches of limits established in the system	U	
1.6	Allow bank to define new products, new coupon/yield computation logic and new bucketing rules without extensive rework and recoding.	U	
2	**Behavioral Analysis**		
2.1	allow user to configure behavioral analysis using RBI guidelines, trend analysis, historic data and user inputs for at least the following assets and liabilities with no contractual maturity, from the perspectives of SLS and IRS reporting:	U	
	Current and Savings Bank Deposits	U	
	Overdue Deposits	U	
	Term Deposits	U	
	Bills Payable	U	
	Cash Credit and Overdraft (CC/OD)	U	
	Prepayment of Term Loans	U	
	Un-availed Portion of CC/OD/WCDL	U	
	Devolvement of LCs/Guarantees.	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
2.2	provide a choice of statistical models to analyze behavior of assets and liabilities, including but not limited to, the following:		
	Drawdown analysis	U	
	Rollover analysis	U	
	Prepayment/Early redemption analysis	U	
	Past due analysis	U	
2.3	back test behavioral analysis assumptions by means of industry standard tests (Conditional coverage tests, unconditional coverage tests, duration tests, etc.), in order to assess accuracy of expected behavior.	U	
2.4	compare and tabulate expected versus actual historic behavior and enable an analysis of reasons for deviation, if any	U	
2.5	allow user to tweak behavioral study assumptions and provide estimates of changed behavior to enable accurate recalibration	U	
3	**Liquidity Risk Monitoring**		
3.1	Liquidity Risk		
3.1.1	Monitor daily risk positions through cash flow gaps and maximum cumulative outflow measurements. Intra-day bank liquidity position and currency-wise open position reporting included in this requirement.	U	
3.1.2	generate and monitor all ratios relevant to liquidity, including but not limited to, the following:	U	
	Liquidity Coverage Ratio and Net Stable Funding Ratio in line with RBI guidelines on Basel III implementation	U	
	Market Value of unencumbered High Quality Liquid Assets (HQLA) required for the bank to meet regulatory liquidity coverage ratio requirements	U	
	Actual vis-à-vis regulatory levels of CRR and SLR	U	
	Regulatory monitoring ratios:	U	
	(Volatile liabilities – Temporary Assets)/(Earning Assets – Temporary Assets)	U	
	Core deposits/Total assets	U	
	(Loans + mandatory SLR + mandatory CRR + Fixed Assets)/Total Assets	U	
	(Loans + mandatory SLR + mandatory CRR + Fixed Assets)/Core Deposits	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
	Temporary Assets/ Total Assets	U	
	Temporary Assets/ Volatile Liabilities	U	
	Volatile Liabilities/Total Assets	U	
	Impact of stress scenarios such as drying up of funding sources, increased market volatility, bank-run, etc. on the bank's liquidity position	U	
	Utilization against contingency plan triggers and limits	U	
	Any other ratio required by the Bank from the perspective of stock approach	U	
	liquidity management (Swapped Fund Ratio, Credit Deposit Ratio, Loan losses to net loans, etc.)	U	
3.1.3	allow user to configure liquidity ratios and trigger/limit levels through a graphic user interface, defining the numerator and denominator out of bank balance sheet inputs	U	
3.1.4	provide an overall consolidated view of the total market liquidity risk faced by the Bank by virtue of its current portfolio	U	
3.2	Liquidity Stress Testing		
3.2.1	possess a robust stress testing engine to simulate systemic and specific events including but not limited to, the following	U	
	Deterioration in firm's credit rating	U	
	Run-off of non-contractual liabilities using statistical approaches	U	
	Periods of combinations of sudden and prolonged market volatility	U	
	Greater than expected drawdown of non-fund based exposures	U	
3.2.2	should be capable of analyzing the impact of concentration of funds by source, borrowers and currency to identify significant sources of market liquidity stress	U	
4	**Scenario Analysis**		
4.1	produce budgetary and customer scenarios defined by type of contract.	U	
4.2	scenario-dependent projections of future earnings, balance, market values, yields, cash-flows, etc.	U	
4.3	measure earnings effects, future liquidity risk, and product-inherent optionality risk	U	
4.4	allow user to simulate new business, by defining volume projections, instrument characteristics, price rate models, and maturity schedules	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
4.5	perform income simulation: Future Earnings and capital requirements.	U	
4.6	provide a robust cash flow engine as part of the system that supports at least, but not limited to, the following:		
	Conventional amortization (EMI)	U	
	Annuity payments with fixed maturity	U	
	Annuity payments with variable annuity	U	
	Principal only	U	
	Balloon/Bullet/Staggered payments	U	
	Amortization for floating rate instruments	U	
	Customized (user-supplied) amortization schedules	U	
	Negative amortization	U	
	NPAs and Restructured accounts	U	
	Instruments such as Bonds, Swaps, Repos, Reverse Repos, CDS, futures, options (cash-flow, swap, cap/floor) and forward rate agreements	U	
	Instruments without embedded optionality (E.g., CASA deposits)	U	
	Off-balance sheet assets and liabilities without defined maturities (E.g., LCs, LGs)	U	
4.7	model instrument / account level prepayment assumptions by, but not limited to, the following methods:		
	By specifying a constant flat percentage of the current balance	U	
	By specifying prepayment rates based on either age, term or rate characteristics	U	
	By specifying mathematical relationships between prepayment rates & bank lending rates/spreads over base rate	U	
	By incorporating seasonality adjustment factors based on past xperience for prepayments	U	
4.8	support the choice of at least the following term structure models (including no arbitrage models):		
	Merton	U	
	Vasicek	U	
	Ho & Lee	U	
	Extended Vasicek	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5	**Data Requirements**		
5.1	Market Data Sourcing		
i.	capture price/volatility/spread data relating to a broad range of products from different data providers, to allow the Bank to record its current and likely future treasury activities accurately, including, but not limited to, the following:	U	
	Fixed Income Investments (Central Government Securities, State Government Securities, Other Approved/SLR Securities, Treasury Bills, Cash Management Bills, Corporate Debt, Commercial Paper, Certificates of Deposit)	U	
	Stock Investments (Equity, Preference Shares and Mutual Funds)	U	
	Lending and Borrowing Operations (Repo Transactions, Reverse Repo Transactions, Interbank Lending Operations, Central Bank Lending Operations, Call Money, Notice Money, Refinancing operations - NABARD, SIDBI)	U	
	Over-the-counter and Exchange traded Derivatives (Exchange Traded Futures, IR/Fx Swaps, Credit Derivatives, Cross currency swaps, Fx Options, Interest Rate Options, Forward Rate Agreements)	U	
ii.	Allow addition of new market data sources. E.g., configure the system to obtain equity price information from Bloomberg in addition to Reuters	U	
iii.	source time stamped market data (e.g., Open/ High/ Low/ Close) across multiple markets, taking to account varying business hours	U	
iv.	allow user to configure intraday timings for sourcing market data	U	
v.	allow user to configure change in market data source as either temporary or permanent	U	
vi.	allow user to configure alternative data source in case of failure of primary source system (E.g., BSE prices when the NSE price feed suffers disruption)	U	
vii.	Obtain information from external sources on historic values of various risk factors (E.g., equity index and individual equity prices, forex prices, commodity prices, spreads over benchmark curves for Bank/PSU/FI/Corporate rated bonds, etc.) relevant to market risk computations. Historic data for at least last 5years should be available.	U	
viii.	allow modification of input price/curve data as required by the pricing model, e.g. transforming quarterly quotes into monthly prices	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5.2	Static & Reference Data Sourcing		
i.	source reference data from relevant sources including:	U	
	Instrument reference data for (past, current and future) traded products. (E.g., Bloomberg/Reuters/FIMMDA ticker, Index constituents, etc.)	U	
	Internal Desk/Book hierarchy data	U	
	Product hierarchy data (e.g. relationship of asset classes, instruments and subproducts	U	
	Counterparty data including a standardized, organization-wide counterparty	U	
	hierarchy	U	
	Calendar / business day conventions	U	
	Static data values (e.g. country codes, currency codes etc.)	U	
ii.	allow definition of new reference data types and modification of pre-defined data types (E.g., addition of a new level in the product hierarchy)	U	
iii.	allow sources of reference data to be changed, and the reference data should have an attribute identifying data source	U	
iv.	support all types of day count basis including 30/360, Actual/360, Actual/365, Actual/Actual, 30E/360	U	
v.	support International Swaps and Derivatives Association (ISDA) -defined business day conventions such as following, modified following, preceding, next month, this month, average of the month etc.	U	
vi.	support user defined reprising to input changes in asset prices that do not flow from data feeds	U	
5.3	Holiday Calendars		
i.	load calendar schedules from external sources including but not limited to SWIFT, International Holiday schedule and Bloomberg holiday schedule etc.	U	
ii.	allow users to set calendar schedules through interfaces/ patch updates	U	
iii.	allow configuration of multiple holiday tables for each currency and country	U	
iv.	allow users to input calendar schedules at least 7 years forward	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
v.	edit and override global calendar and holiday tables	U	
vi.	flag trades executed on a global holiday through exception messages and exception reports	U	
vii.	define settlement instructions based on emergency holidays	U	
viii.	model cash flows and interest accruals based on holiday calendar and standard day roll conventions	U	
5.4	Position Data		
i.	retrieve position data from treasury system to perform valuations	U	
ii.	allow user to create, save and load portfolios of bank's position in various instruments/ currencies	U	
iii.	automatically recalculate the trade or portfolio value if (relevant) market rate changes are detected	U	
iv.	allow user, based on access rights, to create portfolios across all dimensions (E.g., Bank-wide, HFT/AFS/HTM, Trading Book, commodity, Risk factor, individual position, Trader, currency, delivery location, Trade type, Time bucket, etc.)	U	
v.	support different types of portfolio revaluation methodologies: marginal, full, no recalculation, manual, timed (i.e. every 10 minutes, batch), etc., or any portfolio-wise combination of the same	U	
vi.	provide various options to value the Bank's investment portfolio: current market rates, freeze current market rates (snapshot), etc.	U	
vii.	facility to specify if portfolio should be loaded as of a specific date in the past	U	
viii.	select Position / Price / Liquidation methodology for aggregated positions: Average Cost, LIFO, FIFO, Max Profit, Least Profit, User defined	U	
ix.	display information at trade and portfolio levels	U	
x.	display valuation results using drill down capabilities (e.g. Local Currency, Base Currency, Reference Currency)	U	
xi.	display portfolio results, where possible, by a user definable maturity grid	U	
xii.	bucket portfolio open positions into the maturity grid using industry standard methodologies: Previous Bucket Point, Following Bucket Point, Proportional , Nearest, Delta Equivalent, Proprietary, etc.	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
xiii.	create, name, save and load portfolio 'views' as result of the previous choices	U	
xiv.	provide Hedge Effectiveness Testing and Portfolio Optimization functionalities. I.e., the system should be able to compute the effectiveness of hedges as well as to determine the optimal portfolio composition given various constraints (E.g., minimum/ maximum investments in certain assets)	U	
5.5	Data Upload		
i.	time stamp and record data source for each data upload	U	
ii.	allow user to decide the frequency and mode of data upload, e.g., timed update or continuous update	U	
iii.	upload position, rate and valuation information of the investment portfolios of local as well as overseas branches to allow consolidated reporting	U	
5.6	Data Overrides and Adjustments		
i.	allow users to apply adjustments to address erroneous values via single point changes or mass updates	U	
ii.	log data corrections and communicate the same to relevant upstream/ downstream systems	U	
iii.	maintain an audit trail of data changes made by users	U	
iv.	allow reversal of changes made based on access rights given to different levels of users	U	
5.7	Data Validation		
i.	validate user entered data at the time of data sourcing, preferably by field input controls, e.g., format of input, date checks, etc.	U	
ii.	support configurable data checks on consistency and integrity of all data inputs (market data obtained from different data providers, position data from treasury systems, etc.). The checks should be configurable on single data points as well as on groups of data, e.g., curves	U	
iii.	support validation of uploaded data by means of business rules with configurable parameters	U	
iv.	ensure that there are effective checks and controls to ensure that transactions are not loaded multiple times in the host system, i.e., duplication checks	U	
v.	perform data validation to reconcile position data in the treasury system with market risk system	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
5.8	Data Storage and Archival		
i.	store on a daily basis the following information:	U	
	Position and transaction data at a granular level present in the Bank's portfolio	U	
	Market data (yield curves, volatility curves, Fx Spot and Forward prices , FX volatilities)	U	
	Market prices (for quoted instruments) and book value for instruments that are not traded often	U	
	Net Present Values(NPV), MTM and Greeks at transaction and aggregated levels	U	
	Value-at-Risk at transaction and aggregated levels	U	
	Scenario Results at transaction and aggregated levels	U	
	Profit & Loss results at transaction and aggregated levels	U	
ii.	import historical market prices files from external vendors for volatilities and correlations calculations for transactions on new markets	U	
iii.	import historical position information either directly from existing systems or in the form of data upload files to allow easy system migration, generation of historical results and also to mitigate the impact of incorrect data uploads	U	
iv.	store historical market rates information through automatic end-of-day procedures and historical results for at least 10 years	U	
v.	store the complete set of data used as input to calculations performed by the system	U	
vi.	allow users to view complete data snapshot of any previous business day	U	
vii.	support storage of all current and historical position, market and reference data on a daily basis, and allow users to view the complete set of data for any given day	U	
viii.	store system-generated data points (e.g. interpolated values), with configurable flags determining whether or not data is stored	U	
ix.	transform data from source format to a standard format for storage/ archival	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
x.	provide data mining functionalities (e.g. identifying from a set of historical data the worst one month/quarter/year)	U	
xi.	support archiving of data that are beyond a specified time horizon	U	
xii.	export data to secondary storage device without down-time	U	
xiii.	support data retrieval from the specified archives. The archival and retrieval programs should facilitate easier analysis of old data.	U	
xiv.	in-built Data warehousing capabilities or standard interface with Data warehousing solutions	U	
5.9	Data Quality and Statistics		
i.	provide an analysis of data quality, i.e., completeness and accuracy of inbound / outbound data feeds and reporting on key data quality metrics	U	
ii.	provide a tool for automatic verification and validation of uploaded data with appropriate measure of correction	U	
6	**Reporting Requirements**		
6.1	**Aggregation and Drill-down Capabilities**		
6.1.1	record information to identify various dimensions of ALM reporting from the perspective of aggregation, including, but not limited to:	U	
i.	multiple currencies: To handle all currencies the Bank has rate-sensitive exposure to. The system should also be able to convert all currencies to the Bank's reporting currency (INR) using FEDAI spot rates	U	
ii.	multiple departments: To allow rule-based access to different departments as required	U	
iii.	multiple products and product categories: To handle all risk sensitive assets and liabilities that may be present in the Bank's portfolio	U	
6.1.2	allow rule-based aggregation to identify exposures across each dimension above	U	
6.1.3	drill-down from the interest rate sensitivity, structural liquidity and any other analysis to a granular level (E.g., Product level, portfolio level, geography level, etc.)	U	
6.2	**Reporting and Analysis**		
6.2.1	reporting should be compliant with regulatory requirements	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
6.2.2	predict possible business volumes, maturity patterns, etc. utilizing historical data and simulation	U	
6.2.3	report at any level of detail (drill down and aggregate)	U	
6.2.4	build customizable hierarchical roll up structure	U	
6.2.5	provide graphical representation of reports as appropriate report across product, account, business unit etc	U	
6.2.6	perform the following analysis:-		
	Interest Rate Risk in the Banking Book and Trading Book: Interest Rate Sensitivity	U	
	Analysis – Traditional Gap Analysis and Duration Gap Analysis	U	
	Structural Liquidity Analysis	U	
	Re-pricing balance sheet/gap analysis	U	
	Cash flow balance sheet	U	
	Breakup of cash flow and balance sheet into deterministic (contractual assets and liabilities) and dynamic (non-contractual assets and liabilities)	U	
	Market value balance sheet (present values)	U	
	Value effect: economic value sensitivity key rate duration	U	
	Scenario analysis (parallel shifts, non-parallel shifts)	U	
	Trend analysis	U	
	Static profitability analysis: yield report	U	
	Effective yields	U	
	Market Value Sensitivity (MVS)	U	
	Market Value of Equity (MVE)	U	
	NII and NIM analysis	U	
	Behavioral analysis for rate sensitivities with embedded optionality	U	
6.2.7	generate standard reports for following:		
	RBI mandated Structural liquidity reports:	U	
	Domestic Currency – Indian Operations	U	
	Foreign Currency – Indian Operations	U	
	Combined Indian Operations – Domestic and Foreign Currency	U	
	Overseas branch Operations – Country-Wise	U	
	Consolidated Bank Operations	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
	RBI mandated Interest Rate Sensitivity reports to monitor Interest Rate Risk in the	U	
	Banking Book and Trading Book:	U	
	Traditional (Static) Gap Analysis	U	
	Duration (Dynamic) Gap Analysis	U	
	RBI mandated Short Term Dynamic Liquidity Statement	U	
	Currency-wise mismatch reports	U	
	Cash flow projections	U	
	Bucket-wise mismatch reports	U	
	Variance analysis	U	
	Mark to market reports	U	
	Net Interest Income reports	U	
	Economic Value of Equity Analysis	U	
	Product/ Account Level Profitability Analysis	U	
	Line of Business Level Profitability Analysis	U	
	FTP Division of spread analysis, by lending, funding and interest rate risk spreads	U	
	Total Organizational Level Profitability Analysis	U	
	Cost of Fund by Product/Account	U	
	Net Interest Margin Analysis	U	
	Key early warning/risk indicators	U	
	Status of contingent funding sources	U	
	Interest Rate Risk Analysis/Reporting	U	
	Value at Risk Analysis and Reporting	U	
	Earnings at Risk Analysis and Reporting	U	
	Market Value - deterministic and stochastic	U	
	Scenario Income reports	U	
	Gaps statement based on contractual maturity	U	
6.2.8	provide querying facilities to build own queries	U	
6.3	**Report Customization**		
i.	provide a user-configurable ALM dashboard	U	
ii.	provide user-definable time buckets	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
iii.	provide user-definable chart of accounts, classification, sub-classification, maturity buckets, reference rates, yield curves, currencies etc.	U	
iv.	Ratio Builder, which allows users to define any number of categories and ratios	U	
v.	support custom report designing	U	
vi.	allow users to specify the exact layout of the required report including location of fields, header, footer, page numbering, title etc.	U	
vii.	allow users to define structures and fields of each report by selecting fields from databases of their choice	U	
viii.	provide a report writing wizard that provides users with step by step menus and allows them to draw up reports in the required format	U	
ix.	allow users to present outputs from reports in the form of graphs, charts and other graphical representations	U	
x.	allow for sorting of data in reports	U	
xi.	isolate and report errors and exceptions	U	
xii.	allow user defined filters	U	
xiii.	customize reports with respect to time period considered, portfolios considered, levels of granularity, etc.	U	
6.4	**Scheduling of Reports**		
i.	generate pre-defined end-of-day, end-of week and end-of month reports	U	
ii.	generate pre-defined reports with minimum user interference	U	
iii.	define a schedule for reports and reports should be generated as per the frequency defined by the Bank	U	
iv.	allow defining the users to whom reports can be automatically sent	U	
6.5	**Archiving of Reports**		
i.	archive historical reports	U	
ii.	archive historical rates extracted from market information systems	U	
6.6	**Ad hoc Reporting**		
i.	allow users to customize standard reports for their own profile (E.g., different portfolio, specific time period, comparing with historic results), without affecting reports generated by other users	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
ii.	allow users to configure what-if analysis to analyze the impact of new positions, amendments to existing positions, unwinding positions, etc.	U	
6.7	**General Requirements**		
i.	generate all regulatory reports required in appropriate regulatory formats	U	
ii.	provide pre-configured internal reports in standardized templates, for effective market risk management.	U	
iii.	allow user to configure and generate new ad hoc reports and save report configuration in user profile	U	
iv.	retain historic report information to compare report outputs over a configurable time period (E.g., previous day or previous month end)	U	
v.	distribute reports according to user-configurable distribution parameters, e.g., email to a generic inbox, save to a server location, etc.	U	
7	**FTP Requirements**		
7.1	provide distinct modules to approach FTP, enabling the user to define the interest rate environment, interface with the bank systems for information on the product portfolio, establish costing rules at a desired level of granularity, analyze the cost of source and use of funds and generate appropriate end user reports	U	
7.2	provide flexibility to choose from multiple FTP methodologies (Cost of funds/ Net Funding/Pooled Funding/Matched Maturity)	U	
7.3	generate the Base FTP curve for each use and source of fund on the underlying account or transaction attributes at the time of origin at a granular account-level using matched maturity methodologies such as bullet, cash flow and weighted average life funding	U	
7.4	generate the base FTP curve by combination of multiple yield curves for different maturities, as a combination of:		
	Treasury rates	U	
	Funds pool	U	
	Bank cost of funds	U	
	Target borrowing rate	U	

Sl. No	ALM Functional Requirements	Standard (S)/ Alternative Available (A) / Customisable (C) / Unavailable (U)	Bidder Remarks (If Any)
	Swap curves	U	
	CD rates	U	
	LIBOR/MIBOR	U	
7.5	view FTP rates across at multiple granularities:		
	product	U	
	business unit	U	
	branch	U	
	Bank/ entity	U	
7.6	analyze profitability at various levels by generating the economic value and the corresponding FTP rates	U	
7.7	calculate liquidity cost for:		
	on-balance sheet assets consuming liquidity based on tenor at origination date and on marginal cost.	U	
	contingent liquidity risk (cost of holding stand-by liquidity buffer to cover unexpected liquidity needs and cost of roll-over risk) other categories of possible liquidity risk exposure (E.g., country risk cost due to extension of funding to clients in non-fungible currencies)	U	
7.8	calculate, assign / allocate FTP costs, behavioral models or pricing assumptions based on the following:	U	
	Basis risk	U	
	Liquidity risk	U	
	Funding rates (Base Government ZCYC rate/ LIBOR/MIBOR)	U	
	Fixed rate structural funding cost	U	
	Option cost	U	
	On-balance sheet and off-balance sheet products	U	
7.9	project and price undrawn off-balance sheet items, including contingent commitments, by means of stress and scenario testing	U	
7.10	quantify impact due to change in FTP rates, methodologies, behavioral models, volumes, changes in key stress assumptions, etc.	U	

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