

## Climate Risk and impact on Indian Banks<sup>#</sup>

Financial institutions have a significant role to play in the global transition to a greener planet as climate change takes centre stage in global policy initiatives. According to the United Nations (UN) Convention on Climate Change, developing economies would require somewhere between US\$160 billion and US\$340 billion by 2030 to adapt to climate change, and perhaps higher if climate conditions deteriorate further. Most economies have adopted fiscal policy as the primary instrument to achieve climate change commitments and targets. The commonly used fiscal policy instruments include price-based instruments such as carbon taxes, feed-in tariffs, renewable subsidies, and quantity-based instruments such as emissions trading system (ETS) and renewable quotas. A growing role of regulatory policies is however evident, in the global climate policy toolkit. This reflects the recognition of their role in encouraging green or Environmental, Social and Governance (ESG) finance and incentivising investors towards low-carbon instruments. Apart from the challenges posed by the growing need of green financing, which is the financing of environment-friendly projects by financial institutions, such institutions must also consider the credit risk posed by extreme climate events, leading to potential losses. Regulatory institutions are increasingly urging financial institutions to include such risks in their internal models and perform stress test events for the same.

India's growing energy needs as it aspires to become a large developed nation by 2047 will only amplify the need to keep a close watch on its greenhouse gas (GHG) emissions, alongside its growing vulnerability to disruptive climate events, which have caused significant output loss and supply chain breakdowns in the recent past. India has however, acted proactively in its response to the risks posed by climate change, through policy actions and participation in global initiatives to combat climate change. Before the United Nations Climate Change Conference (COP21) in 2015, which enacted the legally binding treaty on climate change on a global level, India submitted its intended nationally determined contributions (NDCs) to the United Nations Framework Convention on Climate Change (UNFCCC) with targets up to 2030, pledging to reduce its emissions intensity of GDP by 33-35 per cent from 2005 levels; increase the share of non-fossil-fuels based electricity to 40 per cent with the help of transfer of technology and low-cost international finance mechanisms such as the Green Climate Fund; and create an additional carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent through extra forest and tree cover. At COP26 held in Glasgow in 2021, India updated its NDCs, which represented the framework for its transition to cleaner energy for the period 2021-2030. These included raising the non-fossil-fuels-based energy capacity of the country to 500 Gigawatt by 2030, raising 50 per cent of energy requirements from renewable sources; and 45 per cent reduction of carbon intensity by 2030.

### Global Financial Sector Initiatives

In a discussion paper released in 2023, researchers at the Federal Reserve analysed how global systemically important banks (G-SIBs) are countering climate risk. According to the paper, such initiatives have the potential to impact price stability mandate adopted by several central banks. For example, several European Central Bank (ECB) officials have noted that climate change directly relates to their price stability mandate as

<sup>#</sup>Debjyoti Roy is Deputy Manager I, Research Department, Clearing Corporation of India Limited.

the increasing frequency and severity of climate disasters will have implications for inflation. G-SIBs' plans address both mitigation and adaptation efforts. On the mitigation front, most G-SIBs have committed to provide more green financing while some have indicated they would restrict financing to high-emissions industries. On adaptation, G-SIBs are developing more robust climate risk management practices and changing their business models to take advantage of new opportunities in sustainable finance.

The global regulatory landscape regarding climate change is also becoming more stringent. In 2015, the Financial Stability Board (FSB) established the Task Force on Climate-related Financial Disclosures (TCFD) with the goal of developing more effective climate-related disclosures. The TCFD recommended that organizations report their climate-related disclosures around four thematic areas: governance, strategy, risk management, and metrics and targets. All G-SIBs have signed on to the TCFD, and submitted a disclosure report at the end of the year since 2021. With the release of their 2023 report, the TCFD have however been disbanded, and the International Stability Standards Board (ISSB), established on the side lines of the COP26 summit at Glasgow, assumes future responsibility for monitoring the progress of companies' climate-related disclosures. The ISSB is also developing global baseline sustainability disclosures standards based on investor needs and financial market requirements.

**Figure 1: Global Initiatives to combat Climate Risk in the Financial Sector**

#### Financial Stability Board

- Task Force on Climate-Related Financial Disclosures (TCFD), 2015
- Superseded by the International Stability Standards Board (ISSB), 2023

#### European Commission

- Sustainable Finance Disclosures Regulations (SFDR), 2019

#### United Nations

- Principles for Responsible Banking (PRB), 2019

#### European Central Bank

- Guide on Climate-related Environmental Risks, 2020
- Good Practices for Environmental Risk Management, 2022

#### Glasgow Financial Alliance for Net Zero (GFANZ)

- Global alliance combining seven initiatives formed between 2019 and 2021 to mobilize climate finance in one sector -wide strategic forum

The Principles for Responsible Banking (PRB) was created in 2019 by the United Nations Environment Programme Finance Initiative in collaboration with the global financial sector. The PRB's fundamental ambition is to integrate sustainable finance and practices into banks' business models. As of December 2021, over 250 banks, representing over 40 percent of total global banking system assets, have signed onto the PRB. Banks have 18 months from signing to publish a self-assessment outlining their impact on societies, economies, and environments and to establish measurable targets for improving these outcomes. The United Kingdom became the first G20 country to require Britain's largest companies and financial institutions to report on their climate-related risks and opportunities, in line with TCFD recommendations. In 2019, the European Commission adopted the Sustainable Finance Disclosures Regulations (SFDR), which requires financial market participants to disclose information to help investors assess the sustainability performance of financial products. The European Banking Authority (EBA) also recently published detailed and binding disclosure standards for Environmental, Social, and Governance (ESG) risks, which seek to enhance consistency and meaningfulness of institutions' disclosures and help establish international best practices. In the United States, the Securities and Exchange Commission (SEC) is considering new rules requiring large publicly traded companies, including banks, to disclose their climate-related risks and greenhouse gas (GHG) emissions.

The Network for Greening the Financial System (NGFS) is a group of central banks and supervisors that collaborate on developing tools and methodologies for managing climate-related risks in the financial sector. The NGFS has developed several reports and guidelines, including the "Guide for Supervisors: Integrating climate-related and environmental risks into prudential supervision<sup>1</sup>" and the "NGFS Climate Scenarios for central banks and supervisors<sup>2</sup>".

The European Central Bank (ECB) published a guide<sup>3</sup> for financial institutions in November 2020 (see annexure), to help consider climate-related and environmental risks when formulating and implementing their business strategy and governance and risk management frameworks. The ECB mentioned that it was not binding for institutions, rather intended to serve as a basis for supervisory dialogue.

Following up on the supervisory guide, the ECB published a thematic review in November 2022, on the institutions' capabilities to steer their climate and environmental (C&E) risk strategies and risk profile to foster alignment set out in the guide (November 2020). The review was conducted in tandem with the first supervisory stress test on climate-related risks, within which banks' stress testing frameworks were assessed, including from a qualitative perspective. There was consensus that climate risks have material impact on the risk profile and strategy of participating institutions. Most institutions have therefore put in place at least basic practices for most areas identified by the 2020 guidelines. Many institutions are however still in the wait-and-watch stage in terms of a long term strategy towards net zero emissions target of 2050 set by the European Union (EU). The ECB came to the conclusion that virtually all the institutions need to make forward looking efforts to manage C&E risks on a sustainable basis.

<sup>1</sup>[https://www.ngfs.net/sites/default/files/medias/documents/ngfs\\_guide\\_for\\_supervisors.pdf](https://www.ngfs.net/sites/default/files/medias/documents/ngfs_guide_for_supervisors.pdf)

<sup>2</sup>[https://www.ngfs.net/sites/default/files/medias/documents/ngfs\\_climate\\_scenarios\\_for\\_central\\_banks\\_and\\_supervisors\\_phase\\_iv.pdf](https://www.ngfs.net/sites/default/files/medias/documents/ngfs_climate_scenarios_for_central_banks_and_supervisors_phase_iv.pdf)

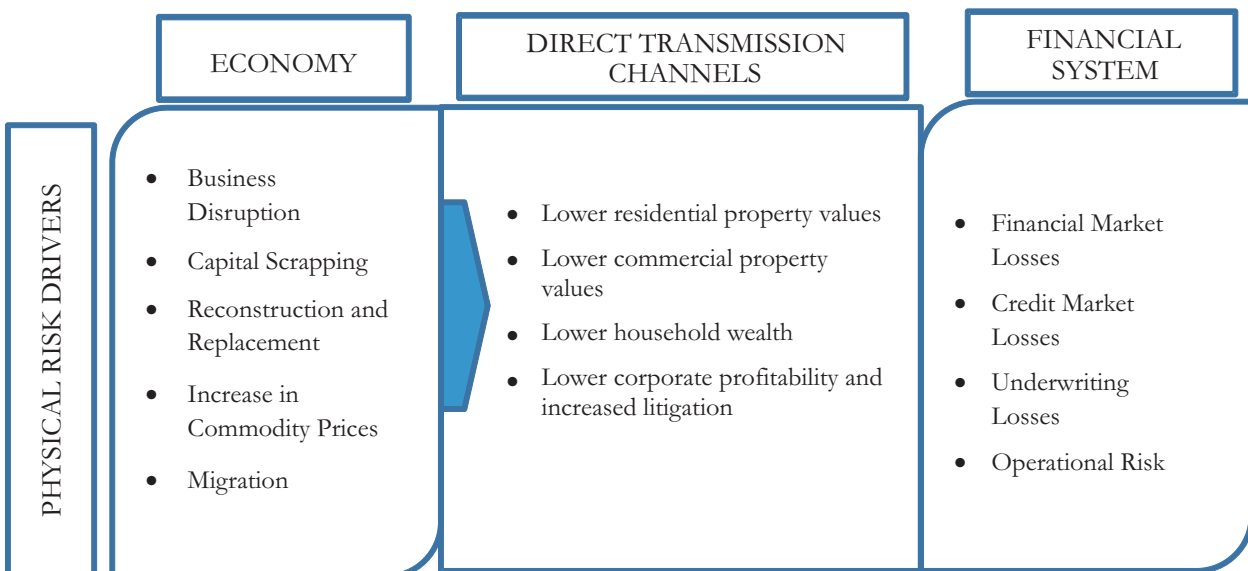
<sup>3</sup><https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.202011finalguideonclimate-relatedandenvironmentalrisks~58213f6564.en.pdf>

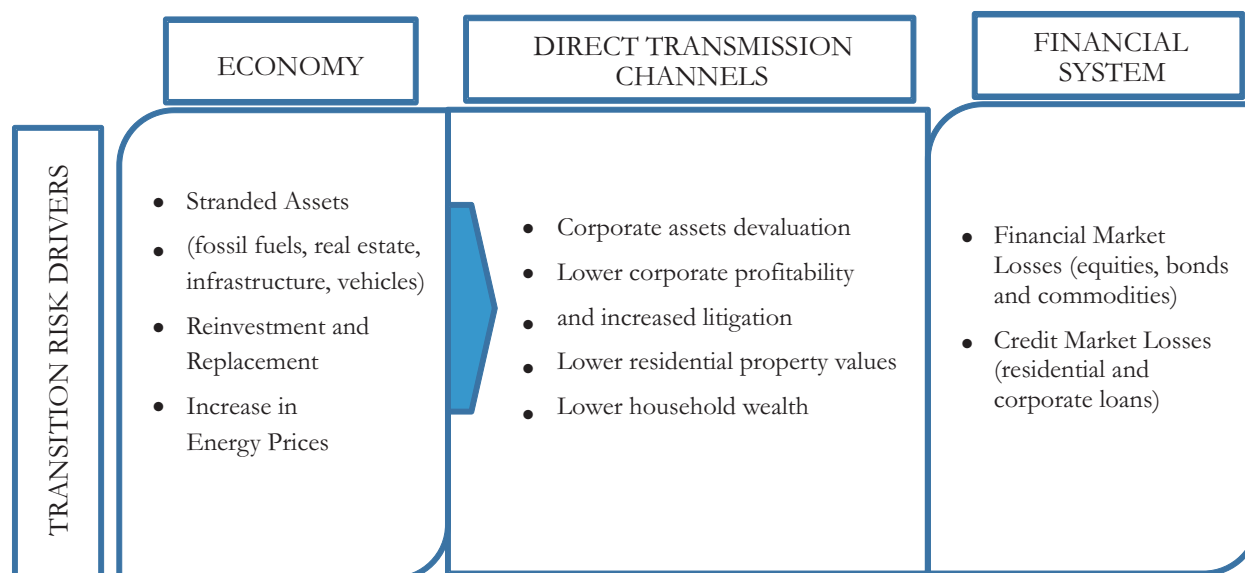
## Macro-Economic Impact of Climate Change

India's diverse topographical and demographical characteristics exposes the economy to varied climate risks. For example, India's long coastline, also referred to as the coastal plains, features among the most densely populated regions of the world, primarily owing to its fertile soil and accessibility to ports. However, global warming leaves the coastal plains susceptible to flooding owing to rising intensity and frequency of extreme sea level events, in the form of tides, waves, storm surges and rise in mean sea level. Coastal cities are prone to cyclones and also face acute dangers of frequent flooding and salinization of farmlands and freshwater supplies. The Central Peninsular Plateau is vulnerable to extreme heatwaves, forest fires and droughts. The Indo-Gangetic plains, also known as the food bowl of India, due to their fertile land yielding high crop output, are also vulnerable to river floods, thunderstorms and heatwave events.

In 2019, India suffered an economic impact of approximately US\$69 billion due to climate related events, in comparison to US\$80 billion (approx.) between 1998 and 2017 (UNISDR, 2018). Additionally, the South West Monsoon has been sporadic and uneven in recent times, due to climate change, leading to higher food inflation and related volatility. Mani et al (2018) observed that India could lose nearly 2.8 per cent of its GDP due to climate related events, impacting the living standards of nearly half of its population by 2050. The World Bank (2022) pointed out that India could account for 34 million of the projected 80 million global job losses from heat stress associated productivity decline by 2030, accounting to up to 4.5% of GDP.

**Figure 2: Interlinkages between the Economy, Climate related risk events and the Financial System**





Apart from perceiving the macroeconomic impact of climate change, there is also the need to assess the impact of transitioning towards a green economy. The report pointed out that under the current NDC, India's target of achieving a net-zero emission target by 2070 would require the share of green energy in India's energy consumption basket to jump to 70 per cent, from around 5.5 per cent in 2021-22. Achievement of net zero under this scenario would lead gross GHG emissions to peak by 2032-33 and decline thereafter to deliver net zero GHG emissions by 2070. The level of energy consumption by 2070 would be 1.8 times higher than that of 2021-22 level as against 7.2 times higher under the baseline scenario.

By simply pursuing a linear growth policy might not help achieve the ambitious targets set by the NDCs. To achieve the twin goals of becoming an advanced economy (AE), as well as a net zero nation by 2070, further policy actions might be necessary. In particular, coordinated policy actions together with technological improvements and structural changes may be necessary for India to simultaneously meet its dual goals of becoming an AE with net zero emissions.

### Impact of Climate Change on the Financial Sector in India

Financial systems are exposed to both physical and transition risks from climate change, which propagate through both macroeconomic and microeconomic channels [Basel Committee on Banking Supervision (BCBS), 2021]. The impact of these risks may materialise with uncertain time lags, and are therefore difficult to predict. For banks, as uncertainty rises, estimation of default probabilities for loans would become more difficult and uncertain, resulting in higher interest rates and insurance premiums. In view of higher expected credit loss, lending institutions may turn risk averse, with higher provisions and risk capital, which may adversely impact credit growth, although the economy may need higher, not lower, credit to support successful green transition. According to literature, India is simultaneously most vulnerable to climate change induced physical risks (IMF), as well as least resilient among major economies [Peszko et al. (2020)]. Both physical and transition risk drivers from climate events can reduce a borrower's capacity to service or repay debt and erode a

lender's ability to fully recover losses if the pledged collateral values are insufficient. Banks that are highly exposed to sectors more dependent on fossil fuels, or sectors which contribute highly to emissions due to the nature of their products, such as automobile and thermal power, are more exposed to transition risks. In recent years, bank credit to green industries has accelerated at a pace faster than that to energy-intensive (brown) industries, which is a sign of improved recognition of climate risks. The gross non-performing assets (GNPA) ratio of green industrial loans, however, has also been higher during the same period, especially for public sector banks (PSBs). According to a recent report by domestic think tank Climate Risk Horizons, Indian big banks are unprepared to face climate change related risks (see box).

**Box 1: Key Observations on the Climate vulnerability of Indian banks by Climate Risk Horizons**

- Only two private sector banks have a climate based credit policy against financing fossil fuels
- Only eight banks are included in international associations for climate initiatives like UN Principles for Responsible Banking, Carbon Disclosure Project (CDP) etc.
- Only eight banks disclose their emissions at a detailed level, such as direct emissions, and those happening at the level of their business value chain
- None of the Indian banks have set a net zero target which covers the scope emissions<sup>1</sup>
- Only four banks have set a target to achieve carbon neutrality by 2030
- 44% of Indian banks have no plans to contribute to the country's new ambitious renewable energy sector
- Only 10 of the major banks in India have a proper, dedicated climate risk management committee at the board level

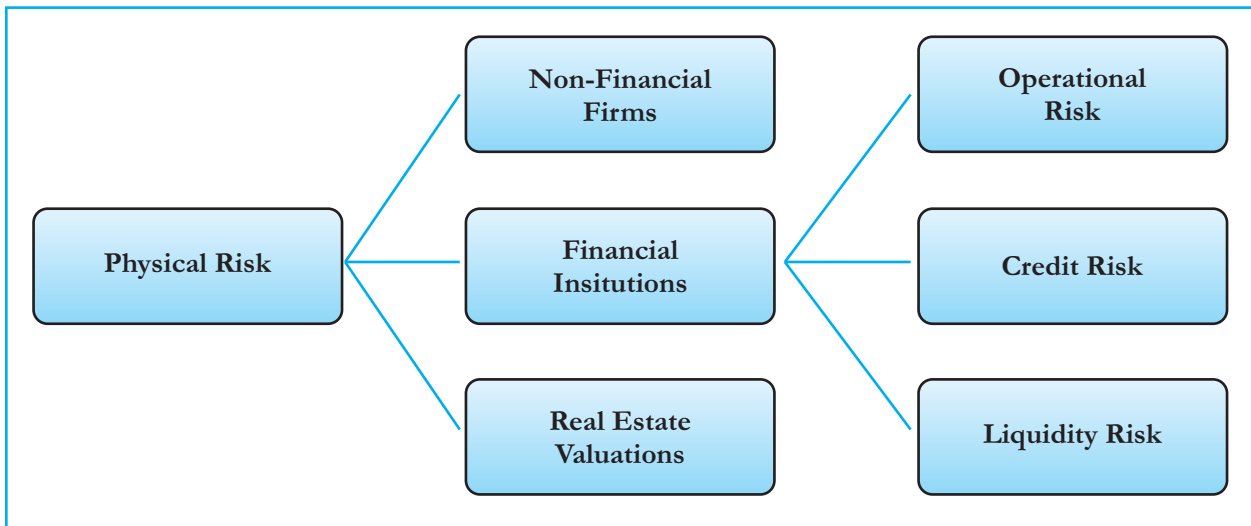
<sup>1</sup>Typically, under the prevalent three-scope system of disclosure, organizations have to calculate and disclose even indirect emissions such as those related to employee-travel related expenses, electricity consumption and paper consumption.

The activities of Non-banking financial companies (NBFCs) also require close monitoring for transition risks, as according to the RBI<sup>4</sup>, NBFCs extend about half of their gross credit to brown industries, and any physical or transition risk arising in such industries can have widespread implications for macro-financial stability in the domestic economy. Risks arising out of climate change can also have implications for asset prices and associated volatility, ability of banks to raise funds, and can exacerbate operational risks for institutions. A study on the relationship between climate change and Asian stock markets suggests that the former has a statistically significant negative impact on long term return volatility of about 20 per cent of stocks (Oloko et al., 2022). In times of crisis, competing claims on liquidity from firms and the lenders may give rise to a tension between the two. Such tensions generally manifest as higher spreads on credit, higher charges for covenant violations, and barriers to drawdown of credit lines (Acharya et al. 2020, 2021). Climate events can also exacerbate operational risks as corporations and banks could be subject to legal and regulatory compliance risk,

<sup>4</sup>RBI Report on Currency & Finance, 2022-23, Chapter III

especially from climate-related lawsuits. Further, extreme weather events may impact the financial sector by forcing office closures or damaging crucial resources such as data centres. Stronger enforcement of regulatory and disclosure requirements by the regulator coupled with a competitive market structure may help mitigate the adverse impact of climate change. A climate risk model developed by the RBI indicated that a one-time climate shock can have impact for the output up to 5 quarters ahead, resulting in fall in income and consumption, also translating into the financial sector by means of damage to capital. To counter this, further investments are warranted, which pushed up price levels, and the Central Bank responds by tightening credit, which affects bank profitability. Additional stability risks may arise due to tight liquidity and increase in interest rates.

**Figure 3: Climate Event Induced Risks to the Financial System**



Source: DTCC

**Figure 4: Types of Risks Faced By Financial Institutions Due To a Climate Event**

<b>Credit Risk</b>	<ul style="list-style-type: none"> <li>Deterioration in borrowers' ability to pay back debt</li> <li>Higher probability of default (PD) and higher loss-given-default (LGD)</li> </ul>
<b>Market Risk</b>	<ul style="list-style-type: none"> <li>Change in valuation of financial assets after a significant event</li> <li>Loss in value could trigger a fire sale, leading to a financial crisis</li> </ul>
<b>Liquidity Risk</b>	<ul style="list-style-type: none"> <li>Bank balance sheets would be hit by credit and market risks</li> <li>Lack of refinancing options could potentially lead to tensions on the interbank lending market.</li> </ul>
<b>Operational Risk</b>	<ul style="list-style-type: none"> <li>Bank premises or data centres could be physically impacted by adverse climate event</li> </ul>

Source: Deloitte

To test the resilience of banks and financial institutions in the face of climate events, climate stress tests have been implemented by central banks and regulators. Exercises have been carried out by the French supervisor (ACPR) in conjunction with Banque de France (ACPR, 2020) and Bank of England (BoE) using a bottom-up framework with a direct participation of banks and insurance companies. Other top-down exercises have been undertaken by the ECB (Alogoskoufis et al., 2021) among others. Macro stress tests and banks' internal assessment of climate related risks have not resulted in additional capital requirements, so far.

To measure transition risks for Indian banks, the RBI carried out an empirical exercise<sup>5</sup>, constructing a stranded assets portfolio for India, with 30 per cent weight to NIFTY Energy Index and 70 per cent weight to Coal India Limited. A transition to a less carbon-intensive environment may result in underutilisation of existing fossil fuel reserves, which could be viewed as stranded assets. The returns on the stranded assets portfolio are used as a climate risk factor. The exercise indicated that public sector banks were more exposed to climate risks compared to the private banks in India. The exercise also found that when the repayment obligations of the bank cover only its borrowings, banks remain solvent and can meet regulatory capital requirements even in the face of sudden adverse climate shock. However, if the banks are obliged to repay their borrowings as well as deposits, larger capital shortfalls may be expected.

The RBI conducted a pilot exercise during October-November 2022<sup>6</sup>, for a forward-looking assessment of the exposure, impact, and resilience of participating banks' financial position under severe but plausible scenarios. The objective of the exercise was to assess how the climate risk could impact individual banks, develop climate scenario analysis and stress testing capabilities in the banks and within the Reserve Bank, build in-house capacity in banks for identifying, measuring, and managing climate related financial risks and to facilitate and promote dialogue with the regulated entities (REs) about climate-related financial vulnerabilities. The results indicated that Indian banks were not yet fully integrating climate related risks in their risk analysis and management repertoire, as they viewed that climate stress testing exercises would not influence capital requirements, along with a general lack of data availability and/or expertise to conduct such exercises. The RBI exercise also underlined the material risk of credit loss for banks in the event of extreme weather events, and additional losses under transition risks as the nation moved towards net zero framework.

### Policy Measures

To achieve net zero emission by 2070 and successfully transition to a green economy, India would require an annual investment equivalent to close to 6 per cent of its GDP, by conservative estimates. To finance this additional investment, direct approaches as well as supportive policies are required from the RBI and the Government of India. The Government of India has announced several measures to address the burgeoning need for climate-friendly policies and to fund the investment gap. Policies encompassing all aspects of governance viz. fiscal, monetary, technology, trade, regulatory and social/behavioural, have to work in tandem

<sup>5</sup>RBI Report on Currency & Finance, 2022-23, Chapter III

<sup>6</sup>Climate Stress Testing and Scenario Analysis: Navigating Uncharted Waters; Amit Sinha and Shivang Bhanvadia; RBI Bulletin, January 2024



to achieve the net zero path. Some of the key fiscal policies undertaken by the Indian Government over the years have been to promote alternative fuel and energy production schemes through grants and subsidies. The share of renewables in India's electricity generation increased from around 16 per cent in CY2015 to 23 per cent in CY2022.

The RBI released a discussion paper on Climate Risk and Sustainable Finance in July 2022<sup>7</sup>, along with a survey of the scheduled commercial banks (SCBs) in India on their preparedness on the same topic. The survey found out that a majority of the banks were unprepared to counter the risks borne out of climate risk (see box). The discussion paper released simultaneously highlighted the good practices REs, including SCBs in India should follow in order to integrate climate and environmental considerations in their core lending and investment activities (see box).

**Box 2: Key Observations from the RBI Survey of Scheduled Commercial Banks (SCBs) on Climate Risk and Sustainable Finance**

- Board-level engagement in banks on climate risk and sustainable finance is inadequate
- A majority of banks didn't have a separate vertical for ESG initiatives
- Almost all surveyed banks recognize climate risk to be of material importance
- Most of the banks have decided to gradually reduce their carbon exposure and move to a low carbon environment
- A majority of banks have not aligned their climate-related financial disclosures internationally
- Most banks are looking at capacity building to better understand the financial implications of climate risk

Based on the observations in the survey, the RBI released a discussion paper simultaneously to help regulated entities (REs) to navigate the difficult path towards adoption of climate initiative and manage financial risk (see box).

<sup>7</sup><https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/CLIMATERISK46CEE62999A4424BB731066765009961.PDF>

**Box 3: Discussion Paper on Climate Risk and Sustainable Finance (2022)**

The RBI published a discussion paper on best practices to manage and mitigate climate risk and a roadmap to sustainable finance for REs in July 2022. The paper suggested good practices for REs to follow to integrate climate and environmental considerations in their core lending and investment activities, some of which are enumerated below:

- REs must ensure that material climate related financial risks are considered to be part of their business strategy and risk management framework
- REs may ensure that the Board and the Senior Management have sufficient understanding of such risks, and that the Senior Management is equipped with the suitable capabilities to deal with such risks, achieved through internal workshops, training or external collaborations
- REs may frame a climate related policy by taking into consideration physical and transition risks, which should have a clear assignment of responsibilities and reporting lines across the three lines of defence
- REs may develop a framework to identify which of its activities are exposed to climate-related physical and transition risks
- REs may develop a method to assess the correlation between the carbon footprints of their customers and the associated climate-related risks for them
- REs may carry out substantial measures to mitigate or refrain from climate-related risks that are not in accordance with their risk appetite
- REs may incorporate climate related risks into their business continuity plan
- REs should develop climate scenarios to identify emerging risks across varying timeframes in the future, which may then be incorporated in their strategic decision making
- Preparation of climate disclosures may serve as a mechanism for internal due diligence and impose discipline, leading to better risk management for the REs
- REs may explore aligning their climate related financial disclosures on the lines of the Financial Stability Board (FSB)'s Task Force on Climate-related Financial Disclosures (TCFD), published in 2017
- The REs may set up a voluntary funding target to increase green funding with the approval of their Board, and should consider converting their branches into green branches by adopting climate friendly measures

**Disclosure Framework on Climate-related Financial Risks, 2024**

Following up on their discussion paper in 2022, the RBI in 2024 released the draft of the Disclosure Framework on Climate-related Financial Risks for REs. The rationale behind the framework is to foster an early assessment of climate-related financial risks and opportunities, and also instil market discipline. The

thematic pillars under the Disclosure Framework encompass governance, strategy, risk management and metrics & targets. The suggested timeline of disclosures for REs shall be as follows:

**Table 1: Climate-related Risk Disclosure Framework Glide Path for REs**

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

*Note: Scheduled Commercial Banks (SCBs), All India Financial Institutions (AIFIs), Non-banking Financial Companies (NBFCs), Urban Co-operative Banks (UCBs)*

**Green Bonds:** The Government also initiated the auction of sovereign green bonds (SGBs) in the fiscal year 2022-23. Green Bonds are standard, fixed-income financial instruments (bonds) where the proceeds are exclusively utilized for financing climate change mitigation or adaptation related projects or programs. SGBs can be a stable source of financing for Government expenditure on climate related infrastructure and can facilitate the transition to a low-carbon economy which would, however, depend on how they perform relative to conventional bonds. Apart from the Government, the corporate sector can be a significant source of green financing. India's State Bank of India issued a green bond in December 2023 with a face value of US\$250 million for a period of five years. Apart from it, several corporate entities and municipal boards in India have issued green bonds to finance their sustainability initiatives (see annexure).

**Table 2: Top ten global corporate green bond issuances in the quarter ending March 2024**

Sr. No	Entity	Amount Issued	Currency	Issue Date	Maturity Date
1	CA Fastigheter AB (CA-Group)	50,00,00,000	SEK	Mar-24	Mar-27
2	OP Corporate Bank plc	50,00,00,000	EUR	Mar-24	Mar-27
3	CBRE Global Investors Open-Ended Funds SCA SICAV-SIF-Pan	75,00,00,000	EUR	Mar-24	Mar-34
4	European Core Fund	50,00,00,000	EUR	Mar-24	Feb-71
5	Green STORM 2024 BV	75,00,00,000	EUR	Mar-24	Mar-32
6	KBC Group NV	80,00,00,000	SEK	Mar-24	Mar-29
7	Sparbanken Skane AB	1,95,00,00,000	SEK	Mar-24	Mar-29
8	City of Gothenburg	20,00,00,000	SEK	Mar-24	Mar-29
9	European Union	7,00,00,00,000	EUR	Mar-24	Feb-50
10	BBVA	1,00,00,00,000	EUR	Mar-24	Mar-31

*Source: Climate Bonds Initiative*

**Table 3: Sovereign Green Bond Auctions by the Reserve Bank of India**

Date of Auction	Nomenclature	Amount (₹ Crores)	Indicative YTM (%)
25-Jan-23	7.10% GOI SGrB 2028	4000	7.1
25-Jan-23	7.29% GOI SGrB 2033	4000	7.29
09-Feb-23	7.10% GOI SGrB 2028	4000	7.2304
09-Feb-23	7.29% GOI SGrB 2033	4000	7.2965
10-Nov-23	7.25% GOI SGrB 2028	5000	7.25
08-Dec-23	7.24% GOI SGrB 2033	5000	7.24
19-Jan-24	7.37% GOI SGrB 2054	5000	7.37

**Carbon Credit Scheme:** With an aim to promote sustainability and reduce carbon emissions, the Union Government launched the Carbon Credit Trading Scheme (CCTS) and the Green Credit Programme (GCP) under the Lifestyle for Environment (LiFE) IN 2023. The CCTS will aim to create India's first carbon market. Carbon markets are trading systems in which carbon credits are sold and bought. Companies or individuals can use carbon markets to compensate for their greenhouse gas emissions by purchasing carbon credits from entities that remove or reduce greenhouse gas emissions. Greenhouse gas emission reduction targets for obligated entities are expected to drive the carbon market in India, encouraging long term investments in emission reduction technologies in line with the country's nationally determined contributions.

The GCP, legally validated by the Green Credit Rules, 2023, entails voluntary participation of entities, incentivising positive environmental actions through a market based mechanism. The GCP allows entities to generate tradable green credits, independent of the CCTS, thus encouraging the participants to look beyond carbon. The GCP focuses on environment-friendly activities, which can be adapted in a nation-wide manner, enabling a nature-friendly sustainable economy.

**Green Deposits Framework:** The RBI announced the regulatory framework for 'green deposits' in May 2023. The framework, which came into force from June 1, 2023, allows banks and select categories of deposit taking non-bank financial services (NBFCs), including housing finance companies, to establish a dedicated corpus of funds specifically allocated to environment friendly products and activities. It also benefits businesses by providing them with easier access to green loans to support their transition towards net zero emissions.

### Conclusion

Climate policies hold the key to disaster risk reduction and protecting people and the planet, treading the delicate path between trade-off costs and green transition. Fiscal policy, including instruments such as carbon pricing using carbon taxes, green bonds issued by the Government and public sector enterprises for deployment of resources in green projects, and incentives or tax rebates for transitioning to a greener economy. Technological progress in the form of deployment of artificial intelligence (AI) and machine learning (ML) systems to develop, implement and monitor state of the art systems to aid green transition will also play a significant role. In India, the SEBI and the Reserve Bank are taking steps to facilitate green transition by

enhancing disclosure requirements and strengthening risk assessment and management of regulated entities. An assessment based on energy intensity of borrowing sectors to gauge transition risks of Indian banks suggests that risks may emanate from banks' exposures to basic metals, and generation and distribution of energy. To increase green lending, banks would need to invest in upskilling human resources for the entire gamut of the credit appraisal system, preceded by adequate regulatory guidance. Monetary policy initiative such as lower margin requirements for SGBs when used as collateral to avail liquidity from the RBI, reserve requirement relaxation for green credit and promotion of central bank digital currency (CBDC) to reduce the reliance on cash and reduce the associated carbon footprint, can serve as further catalysts for India's transition to net zero.

### References:

- South Asia's hotspots: The impact of temperature and precipitation changes on living standards; M. Mani, S. Bandyopadhyay, S. Chonabayashi, and A. Markandya; World Bank Publications (2018)
- Economic Losses, Poverty and Disasters; United Nations International Strategy for Disaster Reduction (2018)
- Bank lines of credit as contingent liquidity: Covenant violations and their implications; V. Acharya, H. Almeida, F. Ippolito, and A. Perez-Orive; Journal of Financial Intermediation (2020)
- Scenarios and main assumptions of the ACPR pilot climate exercise; Autorité de contrôle prudentiel et de résolution (ACPR) Technical Report (2020)
- Diversification and Cooperation in a Decarbonizing World; G. Peszko, D. Van der Mensbrugge, A. Golub, J. Ward, C. Marijs, A. Schopp, and A. Midgley; World Bank (2020)
- Climate Change: Macroeconomic Impact and Policy Options for Mitigating Risks; Archana Dilip and Sujata Kundu; RBI Bulletin, April 2020
- Guide on climate-related and environmental risks, European Central Bank, November 2020
- Credit Lines and the Liquidity Insurance Channel; V. Acharya, H. Almeida, F. Ippolito, and A. Perez-Orive; Journal of Money, Credit and Banking (2021)
- ECB economy-wide climate stress test: Methodology and results (No. 281); S. Alogoskoufi, N. Dunz, T. Emambakhsh, T. Hennig, M. Kaijser, C. Kouratzoglou, and C. Salleo (2021); ECB Occasional Paper (2021)
- Climate-Related Risk Drivers and Their Transmission Channels; Basel Committee on Banking Supervision (BCBS) (2021)
- Climate Change and Asian Stock Markets: A GARCH-MIDAS Approach; T. F. Oloko, I. A. Adediran, and O. T. Fadiya; Asian Economics Letters (2022)
- Climate Investment Opportunities in India's Cooling Sector; World Bank. (2022)

- Impact of climate related risks on financial services; Deloitte, 2022
- Walking the talk: Banks gearing up to manage risks from climate change and environmental degradation, European Central Bank, November 2022
- Discussion Paper on Climate Risk and Sustainable Finance; Reserve Bank of India, July 2022
- Report of the Survey on Climate Risk and Sustainable Finance; Reserve Bank of India, July 2022
- Climate-related financial risk: An FMI's Perspective, DTCC Systemic Risk White Paper; 2023
- Report on Currency and Finance 2022-23, Various Authors; RBI (2023)
- Climate-driven INFORM Risk, IMF Climate Change Dashboard

[https://climatedata.imf.org/datasets/7cae02f84ed547fbbd6210d90da19879\\_0/about](https://climatedata.imf.org/datasets/7cae02f84ed547fbbd6210d90da19879_0/about)

<https://energy.economictimes.indiatimes.com/news/renewable/can-green-and-carbon-credits-drive-investment-opportunities-in-rural-india/105993326>

<https://energy.economictimes.indiatimes.com/news/renewable/opinion-why-climate-change-poses-a-significant-challenge-for-banks/100276421#:~:text=As%20we%20continue%20to%20grapple,change%20when%20making%20lending%20decisions>

Draft Disclosure framework on Climate-related Financial Risks, 2024, Reserve Bank of India, February 2024

## Annexure

**Box 4: Overview of ECB's supervisory expectations**

- Institutions are expected to understand the impact of climate-related and environmental risks on the business environment in which they operate, in order to be able to make informed strategic and business decisions
- Institutions are expected to integrate climate-related and environmental risks that impact their business environment, while determining and implementing their business strategy
- The management body is expected to consider climate-related and environmental risks when developing the institution's overall business strategy, business objectives and risk management framework, and to exercise effective oversight of climate-related and environmental risks
- Institutions are expected to explicitly include climate-related and environmental risks in their risk appetite framework
- Institutions are expected to assign responsibility for the management of climate-related and environmental risks within the organizational structure in accordance with the three lines of defence model
- For the purposes of internal reporting, institutions are expected to report aggregated risk data that reflect their exposures to climate-related and environmental risks with a view to enabling the management body and relevant sub-committees to make informed decisions
- Institutions are expected to incorporate climate-related and environmental risks as drivers of existing risk categories into their existing risk management framework, with a view to managing, monitoring and mitigating these over a sufficiently long-term horizon, and to review their arrangements on a regular basis. Institutions are expected to identify and quantify these risks within their overall process of ensuring capital adequacy
- In their credit risk management, institutions are expected to consider climate-related and environmental risks at all relevant stages of the credit-granting process and to monitor the risks in their portfolios
- Institutions are expected to consider how climate-related and environmental events could have an adverse impact on business continuity and the extent to which the nature of their activities could increase reputational and/or liability risks
- Institutions are expected to monitor, on an ongoing basis, the effect of climate-related and environmental factors on their current market risk positions and future investments, and to develop stress tests that incorporate climate-related and environmental risks
- Institutions with material climate-related and environmental risks are expected to evaluate the appropriateness of their stress testing with a view to incorporating them into their baseline and adverse scenarios
- Institutions are expected to assess whether material climate-related and environmental risks could cause net cash outflows or depletion of liquidity buffers and, if so, incorporate these factors into their liquidity risk management and liquidity buffer calibration
- For the purposes of their regulatory disclosures, institutions are expected, to publish meaningful information and key metrics on climate-related and environmental risks that they deem to be material, with due regard to the European Commission's Guidelines on non-financial reporting: Supplement on reporting climate-related information

Source: *Guide on climate-related and environmental risks, European Central Bank (ECB), 2020*

**Table 4: Major Policies to address Climate Change in India over the years**

Sr. No.	Year	Policies
1	2013	CSR provisions in Section 135 of the Companies Act, 2013, whereby every company having a net worth of ₹500 crore or more, or turnover of ₹1000 crore or more or a net profit of Rs 5 crore or more during the immediately preceding financial year shall constitute a CSR Committee of the Board.
	2014	Solar-powered toll plaza (2014)
2	2015	Inclusion of Renewable Energy as part of priority sector lending for banks (2015)
	2015	National Smart Grid Mission and the Green Energy Corridor Project for an efficient transmission and distribution network for renewable energy (2015)
	2015, 2019	Faster Adoption and Manufacturing of Hybrid Electric vehicles (FAME India) scheme (Phase I, 2015), (Phase II, 2019).
4	2021	Business Responsibility and Sustainability Report (BRSR) mandated by SEBI as part of corporate disclosure framework (2021)
5	2022	State Energy and Climate Index (SECI) developed by Niti Aayog to track the efforts made by the States and UTs in the climate and energy domains (2022)
6	2023	National Green Hydrogen Mission to make India a global hub for production, utilisation and export of green hydrogen and its derivatives (2023)
7	2023	Union Budget 2022-23
		•Production Linked Incentive (PLI) scheme for the domestic manufacturing of solar modules that will aid in the attainment of 280 GW of installed solar capacity by 2030.
		•Sovereign green bonds have been announced under the government's overall market borrowings in 2022-23.
		•National Clean Air Program under the Ministry of Environment, Forest and Climate Change, and the ministries of Power, New and Renewable Energy, and Urban Affairs.
		•Battery swapping facility with respect to Electric Vehicles
8	2023	National Framework for acceptance of green deposits to foster and develop the green finance ecosystem in the country (RBI, April 2023)
9	2023	Guidelines for issuances of Green Securities by SEBI (2023)
10	2023	Union Budget 2023-24
		•Allocation of ₹35,000 crore towards Green Transition.
		•Announcement of a Green Credit Programme.
		•Viability gap funding for battery storage facility.
		•Evacuation of renewable energy from the Union Territory of Ladakh.
		•PM Pranam scheme to incentivize states and union territories for promoting alternative fertilizers.
		•'Gobardhan' scheme to encourage 500 waste-to-wealth centres including 200 bio-compressed gas plants.
11	2023	Carbon Credit Trading Scheme (CCTS) & Green Credit Programme (GCP)
12	2024	Interim Budget 2024-25
		•Focus on renewable energy and alternative fuel
		•Higher allocation of funds towards Ministry of New and Renewable Energy
		•Production Linked Incentive (PLI) scheme for automobile and auto components
		•Provision of solar panels on rooftops of one crore households
		•Harnessing wind energy potential through viability gap funding
		•Coal gasification and liquefaction capacity of 100 MT by 2030, reducing import dependence
		•Infrastructure support provided to the growing e-vehicle ecosystem



Table 5: List of Green Corporate Bonds Issued in India

Sr. No	Issuer	Issuance Date	Maturity Date	Amount (₹ Cr)	Coupon (%)	Tenure (years)
1	L&T Infrastructure Finance Company Ltd	29-06-2017	18-11-2024	667	7.59%	7
2	Tata Cleantech Capital Limited	18-12-2018	18-12-2023	180	8.74%	5
3	Indian Renewable Energy Development Agency Limited	03-01-2019	03-01-2029	275	8.51%	10
4	Indian Renewable Energy Development Agency Limited	17-01-2019	17-01-2029	590	8.47%	10
5	Ghaziabad Nagar Nigam	31-03-2021	06-04-2025	150	8.10%	4.02
6	Yarrow Infrastructure Private Limited	01-07-2021	01-07-2024	581	6.49%	3
7	Priapus Infrastructure Limited	01-07-2021	01-07-2024	16	6.49%	3
8	Rattanindia Solar 2 Private Limited	01-07-2021	01-07-2024	227	6.49%	3
9	Malwa Solar Power Generation Private Limited	01-07-2021	01-07-2024	197	6.49%	3
10	Citra Real Estate Limited	01-07-2021	01-07-2024	19	6.49%	3
11	Sepset Constructions Limited	01-07-2021	01-07-2024	197	6.49%	3
12	Avaada Solarise Energy Private Limited	02-03-2022	28-02-2025	499	6.75%	2
13	Clean Sustainable Energy Private Limited	02-03-2022	28-02-2025	334	6.75%	2
14	Fermi Solarfarms Private Limited	02-03-2022	28-02-2025	337	6.75%	2
15	Avaada SataraMH Private Limited	02-03-2022	28-02-2025	270	6.75%	2
16	Vikas Telecom Private Limited	30-08-2022	29-08-2025	495	7.65%	3
17	Indore Municipal Corporation	20-02-2023	20-02-2026	244	8.25%	3
18	MINDSPACE BUSINESS PARKS REIT	15-03-2023	13-04-2026	550	8.02%	3
19	Ahmedabad Municipal Corporation	06-02-2024	06-02-2029	200	7.90%	5
20	Vadodara Municipal Corporation	06-03-2024	04-03-2029	100	7.90%	5
	<b>TOTAL</b>			<b>6,128</b>		

Source: Securities & Exchange Board of India (SEBI)