

RESEARCH ARTICLE

Whether Banks are Ready for Transition – Indian Scenario

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Abstract

Climate risk management including transition risk has been evolving as a critical area requiring ambitious actions to be implemented. India being an emerging economy has dependency on fossil fuels which will continue in short run. Reserve Bank of India as a regulator has been working actively in the area after the Global Financial Crisis (GFC) and has recently come forth with the draft of standard disclosure framework for climate related financial risks, to provide guidance to all the regulated entities. The present study aims to evaluate theoretically the preparedness of Indian banks towards transition. In the absence of the relevant data, methodological interventions do not seem plausible. However, the study explores the factual investigations as per the latest available reports in this area. It is found that the major scheduled commercial banks have initiated few important and obvious steps towards climate related risk management and disclosures. Case studies suggest that few major banks have moved early towards integration of the sustainability policies in their risk management system and others are still in the process of doing it. Hence, it may be concluded that Indian banks are unceasingly walking towards transition. The future course of action in this area may be the statistical/empirical investigation of the readiness of Indian banks once the proper database is available in public domain.

Key Words: *Indian; Climate; Transition; Risk*

1. Introduction

Climate change is conceivably the greatest danger gazing at the confront of humankind. How we handle this challenge will be a defining moment of our times. As part of the Paris agreement, nations around the world agreed to come forward with their endeavors to constrain worldwide warming to well below 2 degrees Celsius, ideally to 1.5 degrees Celsius, as compared to pre-industrial levels. To attain this, nations must decrease their Green House Gas (GHG) emissions to 'net zero' by around 2050. But for developing countries this may be an achievable target by 2060 or beyond. India as a nation is also targeting to achieve net zero carbon emission by 2070.

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Received Date: August 05, 2024, **Accepted Date:** September 27, 2024, **Published Date:** December 20, 2024

Citation: Rawat RS. Whether Banks are Ready for Transition – Indian Scenario. *Int J Bank Fin Ins Tech.* 2024;2(1):100-116.



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India's long-term low-carbon development strategy focuses on seven key transitions to low-carbon development pathways including the areas i) electricity, ii) transport system, iii) sustainable urbanization, iv) decoupling of growth from emissions, v) development of carbon dioxide removal and related engineering solutions, vi) enhancing forest and vegetation in line with ecological considerations and vii) economic and financial needs of low-carbon development, Ministry of Environment, Forest, and Climate Change.

Transition of economies to low carbon emissions has environmental benefits which will enable humans to survive prosperously on the earth, but such transition may also result as turbulence to financial sustainability of economies, especially in the banking sector. The turbulence may also result in financial vulnerability if not strategically dealt with.

As banking sector lends credit to different sectors of an economy and such loans remain their main assets in the balance sheet, it is crucial for banks to strategically mitigate the adverse effects of transitions to low carbon sectors prudently. In particular, the share of annual outstanding credit by Scheduled Commercial Banks (SCBs) have remained more than 50 per cent in annual GDP of Indian economy, which have loans and advances to be more than 50 per cent of their total assets during past decade (Table 1).

Table 1: *Assets of all Scheduled Commercial Banks (SCBs) in India.*

Year	Amount outstanding of loans and advances by SCBs	Total assets of SCBs	Share (%) of loans and advances in total assets of SCBs
2022-23	1,43,19,355	2,43,18,174	59
2021-22	1,21,98,769	2,16,74,688	56
2020-21	1,08,06,381	1,95,78,895	55
2019-20	1,03,01,897	1,80,14,425	57
2018-19	96,76,183	1,66,01,045	58
2017-18	87,45,997	1,52,55,033	57
2016-17	81,16,109	1,41,74,606	57
2015-16	78,96,467	1,31,29,288	60
2014-15	73,88,160	1,20,36,992	61
2013-14	67,35,213	1,09,75,929	61

Source: *Statistical Tables relating to Banks in India, RBI.*

The above statistics may help anticipating how severe the impact may be of transition risk on the SCBs and in turn on Indian economy if these banks are not ready to manage the risk. Banking sector as whole may also have similar severe effects.

So, banking sector has a dual challenge to recalibrate its business and operations for supporting transition to green economy and to strengthen their resilience to the resulting changes for safeguarding the financial stability.

2. Objective of The Study

To theoretically assess whether the Indian banks are getting ready for transition towards low carbon economy.

3. Review of Literature

There exist several pioneer investigations in the field of climate change especially on transition risk yet most of them remained qualitative or theoretical. Quantitative aspect of the readiness for transition risk management by the banks may be explored in detail once a proper database is constructed and maintained by the nation. Such a database pertaining to banks may possibly include complete disclosure on GHG emissions due to lending by banks to carbon intensive sectors/activities, banks' strategies towards transition, implementation of disclosure framework on climate-related financial risks, their lending portfolios in renewable energy or activities which emit relatively low carbon emissions, and emissions from their own operational activities etc. It may also be made available to the researchers in public. Therefore, most of the literature that has been reviewed for writing the present paper engages only qualitative studies. One empirical study which has been encountered during review process deals with the low carbon transition risks for financial system in India, by Colenbrander et al [1]. It highlighted that the evidence on exposure to transition risks in emerging market economies (EMEs) like India are scarce. Despite the scarcity of data resources, their study focused upon two objectives, (1) extent of exposure of Indian financial sector to manage transition risks and (2) whether financial institutions and professionals in the nation are ready for managing transition risk. They concluded that Indian financial sector extensively exposed to the risk of transition towards low carbon economy. Nair [2] conducted a study on enabling the climate transition in India & theoretically examined and concluded that Indian banking industry is at an initial stage of formulating an approach to address risks due to climate change and setting up of climate risk management framework. Their study is similar to the present study with respect to findings. Jabado et al. [3] examined through their study the influence of climate-related risks, focusing on both physical and transition risks, on the performance and lending growth of banks. Utilizing panel data from 147 international banks across 37 countries between 2011 and 2020, along with climate data sourced from the Carbon Disclosure Project, the results indicate that transition risks have a positive effect on both bank performance and lending growth. They also acknowledged that significant threats are posed by physical risks to banks' operations. Mondal et al. [4] investigated the influence of climate transition risk on the financial performance and market value generation of firms, specifically within the context of India. The relevant review of literature remained scanty due to the unavailability of pioneers' work in the field of transition risk and its assessment by Indian banks. The present study focuses on the suggested possible ways to transition to green economy by international organizations and their plausible impacts (if implemented) on the banking sector in Section 2. Section 3 broadly discusses about the readiness of Indian banks for managing transition risk and three major Indian banks (SCBs), are presented as case studies which have implemented the advanced actions towards transition, Section 4 will be evaluating the demanding role of Reserve Bank of India (RBI) in preparing the banks for transition, followed by the conclusions in the Section 5.

4. Ways Towards Transition and its Risk to Banking Sector

To achieve Net Zero Emission (NZE) at the earliest (preferably by 2050 as prescribed by United Nations Framework Convention on Climate Change (UNFCCC) [5], ambitious climate actions are required, as severe environmental problems have been increasing globally. IMF [6] suggested that carbon pricing may ideally be considered as one of the possible pathways which is cost-effective too. It may be implemented in the form of levying carbon tax which will discourage the extensive use of carbon emitting resources. However, levying such tax may not be politically feasible. Therefore, another alternative may be to decarbonize the sectors such as agriculture, land use, and transportation etc., which involves higher economic

costs. The carbon pricing may be complemented with the specified policies in the different sectors. So, International Energy Agency (IEA) [7] described the key pillars of decarbonization as following:

4.1. Energy efficiency

Growth in energy demand may be minimized. The fall in extensive use of fossil fuels in the production, refusal to the new oil and gas projects except those which have been approved, and to new coal mines or mine extension projects, are required to increase efficiency in the energy sector. The efficiency should be achieved even though population is growing and in turn, the electricity consumption is also increasing at a robust pace. Table 2 below shows a time series data which depicts that during past decade (from 2013-14 to 2022-23), the energy consumption grew at an average annual rate of 3.05 per cent whereas the growth in population is around 1.11 per cent. At the same time, it may also be noted that GDP increased at an average annual rate of 5.65 percent while the annual growth in energy intensity is negative at 2.46 per cent during the decade.

Table 2: Per-Capita energy consumption and energy intensity.

Year	Energy consumption (in petajoules)	Mid-year population (in '000)*	GDP at 2011-12 prices (₹ crore)**	Per capita energy consumption (in Megajoules)	Energy intensity (Megajoules per rupee)
2011-12	21,869	12,20,171	87,36,329	17,923	0.2503
2012-13	26,249	12,36,220	92,13,017	21,233	0.2849
2013-14	26,822	12,52,267	98,01,370	21,419	0.2737
2014-15	28,453	12,68,310	1,05,27,674	22,434	0.2703
2015-16	29,063	12,84,350	1,13,69,493	22,629	0.2556
2016-17	29,713	12,99,434	1,23,08,193	22,866	0.2414
2017-18	30,966	13,13,815	1,31,44,582	23,569	0.2356
2018-19	32,712	13,28,206	1,39,92,914	24,629	0.2338
2019-20	32,548	13,42,586	1,45,34,641	24,243	0.2239
2020-21	29,807	13,56,980	1,36,94,869	21,965	0.2176
2021-22	33,018	13,70,311	1,50,21,846	24,095	0.2198
2022-23(P)	35,159	13,82,894	1,60,71,429	25,424	0.2188
Growth rate of 2022-23 over 2021-22 (%)	6.48	0.92	6.99	5.52	-0.47
CAGR 2013-14 to 2022-23 (P) (%)	3.05	1.11	5.65	1.92	-2.46
(P): Provisional					
Energy Intensity=Amount of energy consumed for producing one unit of Gross Domestic Product.					
* Mid-Year (as on 1st October) population has been taken from Population Projections for India and states 2011 – 2036; Report of the Technical Group on Population Projections, July, 2020					
** GDP estimates are at base 2011-12 price as per the National Accounts Division's, NSO, MoSPI.					
Source: Energy Statistics 2024, Ministry of Statistics and Programme Implementation (MoSPI).					

4.2. Behavioural changes

Behaviour of the citizens in any economy towards achieving the NZE target seems crucial and they must actively and willingly participate in the transformation of energy sector. For example, citizens may opt for installing a solar heater instead of an electric heater or may prefer buying an electric vehicle over the petrol/diesel/gas versions of vehicles. Basically, their demand for energy-based goods and service may be fulfilled with other low carbon technologies. Hence, Behavioural changes include changes of the following types:

- Reducing the wastage of energy or excessive use may also be discouraged,
- Mode of transports may be switched to cycling, walking etc. for shorter distances,
- Those materials may be used heavily which can be recycled, etc.

4.3. Electrification

The passenger vehicles may be promoted in electric form instead of those run by oil and gas fuels. All the Indian villages (as identified in the 2011 census) have been electrified as of March 31, 2023 (Table 1, Annexure).

4.4. Renewables

The role of renewable energy may be promoted. Hydropower is one such renewable energy source which is low in carbon emission and popular too globally. As per the 63rd edition of the Renewable Energy Country Attractiveness Index (RECAI) report in June 2024 by Ernst & Young Global Limited, India stood at rank seven out of the total 40 countries which were included in the study.

4.5. Hydrogen and hydrogen based fuels

The use of hydrogen and hydrogen-based fuels may be encouraged in industry and in oil refineries and power plants etc., along with the mixing of hydrogen into natural gas for allocation to end users.

4.6. Bioenergy

Use of modern bioenergy resources like biogases, liquid fuels, and modern solid biomasses harvested from sustainable resources, may be encouraged.

4.7. Carbon Capture, Utilisation, and Storage (CCUS)

Implementing CCUS is important to obtain insights into the most challenging sectors where existing assets require carbon emission control. By implementation only, such sectors will be identified and tackled with. According to the recent status report on renewable energy statistics 2023-24 by Ministry of New and Renewable Energy (MNRE), it may be impressive to note that CAGR for renewable energy capacity installation (including large Hydro power) stood at 134.63% pertaining to the period 2014-15 to 2023-24. At the end of 2023-24, share of installed capacity under RE and Non-fossil sectors were at 43.12% and 44.97% respectively.

Apart from decarbonization the sectors in every economy, the emerging economies need support from the developed peer economies by the way of transfer of green technologies and

green investment capital. This may pave ways to transition with low consequences and mitigate the chances of financial turbulence.

How such transition may affect the banking sector in economies and consequently their resistance to financial turbulence evolves as a question which demands a deep insight into the practical and plausible implications due to transition. The present study is attempting to provide answer to the above question along with the description of the state of readiness of Indian banks for transition. For the purpose, a vast available literature on the impact of transition on banks is reviewed and few key insightful points as per Basel Committee on Banking Supervision (BCBS) (2023) at Bank of International Settlements (BIS) [8] are as follows:

- **Credit risk to banks:** The risk may arise in terms of default on bank loans as well as implications of loan spread adjustment to higher risk.
- **Market risk to banks:** Market risk may evolve in terms of high sensitivity of earnings or capital and assets of banks to changes in interest rates, exchange rates, commodity prices, equity prices etc.
- **Liquidity risk to banks:** Banks may face challenges in meeting their short-term liability obligations due to the scarcity of stable sources of funds, as the liquidity of assets pertaining to the banks may undermine due to transition.
- **Lending standards:** Banks' lending standards may need to be updated and supply of credit may be rationed to energy inefficient sectors with high carbon emissions. On the other hand, the lending to green sector projects may be encouraged, however, such green projects are not abundant in number, therefore, create a risk to the banks.

5. Readiness of Indian Banking Sector and Case Studies

For banking sector in any economy there exist three challenges to deal with the above four risks due to transition (Ernst & Young LLP):

- (a) **Risk assessment:** Assessing transition risk is the most challenging job as banks' risk analysts may need to assess multiple industries where they are supplying credits. They may also need to focus on the risk due to financing a high GHG emitting sector or industries as well as on the extended supply chains, in the long term.
- (b) **Lack of industry standards:** There is no standardized industry model to assess such risk. So, assessment methodologies for transition risk may depend upon the chief risk officer of a bank and the board members which may vary from bank to bank in the short term.
- (c) **Skills shortages:** The presence of relevant skilled employees may fall short, for risk management, in terms of cybersecurity, data science and analysis.

This section now proceeds further to assess the state of readiness of Indian banks for transition. As per the report by Climate Risk Horizon [9], there are significant gaps which are present in the preparedness of Indian banking sectors to confront the climate risks. The report examined the progress of 34 major Indian banks (12 public sector, 17 private sector, four small finance banks, and one payments bank) for climate preparedness. This report evaluated the preparedness of these banks on the following parameters which are accompanied with key observations:

- **Fossil fuel exclusion policy:** Only Suryoday Small Finance Bank and Federal Bank are the banks which have a fossil fuel exclusion policy, and it is against the financing of new coal fired power projects including new as well as expanding the coal mines.
- **Financed emissions:** None of the banks have started measuring the financing of emission

- projects except Yes bank which has calculated it for only electricity sector.
- **Disclosure of carbon emissions:** Only 10 out of the 34 select major Indian banks have started disclosing the carbon emissions.
 - **Verified emissions:** Only seven of the 34 banks, have got their emission calculation verified by the third-party assurances.
 - **Climate scenario analysis:** None of the banks have started testing the stress for the changed composition of their portfolios.
 - **Climate-risk management:** Three banks namely Axis bank, Federal Bank and State Bank of India (SBI) have shown progress to in dedicated climate risk management.
 - **Green finance:** Less than one third of these select 34 banks have disclosed the amount financed for green investments.
 - **Exclusion policy:** Only seven banks of these 34 banks have disclosed that they have exclusion policies and described them as well in public domain.
 - **Associations:** Only eight banks have been associated with international organizations working in this area like Carbon Disclosure Project (CDP), Task Force on Climate-Related Financial Disclosures (TCFD) etc.
 - **Net zero targets:** Only SBI has set a net zero carbon target by 2030.

The report has ranked these select 34 banks based on the assessment of these above parameters for each bank and following were the top 10 banks (as per rankings) as given below in Table 3:

Table 3: Rank scores of top 10 Indian banks for climate preparedness.

Bank Name	Rank Score
YES Bank	15
HDFC Bank Ltd	13
AXIS Bank Ltd	13
State Bank of India	12
Kotak Mahindra Bank Ltd	12
IndusInd Bank Ltd	12
Federal Bank	11
RBL Bank	10
IDFC First Bank Ltd	7
ICICI Bank Ltd	5

Source: Climate risk horizon, august 2023 report.

The above key points after evaluation suggested that Indian banking system covering the major banks too, is still unprepared for the transition and requires a great push from the regulators' side. The system is not only unable to measure the impact of climate crisis on their investments but unable to manage the risk that its operations are posing on the environment too.

The present study does not completely agree with the statement of unpreparedness as firstly, the initiatives have already begun by the banks as stated above and secondly the regulators have also begun to play roles in establishing standard frameworks for assessment of climate risk (physical as well as transition risk). Moreover, India being a developing nation may not be able to transit towards low carbon economy as faster as other developed peers would be.

For India, the transition will remain a gradual and a slow process. This transition process has been bringing out other intermittent issues too. Recently, in November 2023, the Chief Economic Advisor (CEA) to the Government of India, in The Energy Transition Dialogues organised by the Global Energy Alliance for People and Planet (GEAPP) in New Delhi, said that India being a most populated nation in the world, may have significant or critical impact on the entire world by its progress in energy transition. So, Indian transition cannot be so fast, keeping in view the large scale of energy demand that cannot be fulfilled by renewable energy alone. Fossil fuels must continue to play a significant role in the short term and in medium term the fossil fuels will exit the energy sector slowly. He also brought forward few issues like intermittency of renewable energy sources and the need for sufficient battery storage etc. which are yet to be resolved. The resolution of these issues involves high cost too.

As a matter of fact, due to such issues, banks have limited sources of investment which are even at an initial stage and may not be so profitable to them. From the business perspective too, banks may be slowly moving towards green investment and gradually be developing the systems for assessment of transition risk. Further, the study moves ahead to present few recent facts and figures pertaining to the GHG emissions and credit exposure of SCBs to major emitting sectors along with the original maturity profiles of outstanding loans and advances of these banks. The electricity or power generation sector remains the major GHG emitter with the share of around 75 per cent emission in the total national GHG emission without Land Use, Land-Use Change and Forestry (LULUCF), as per the latest Biennial Update Report, 2021 (Table 2, Annexure).

Following the energy sector, the agriculture sector is the second largest emitter, and then after, the manufacturing and construction sectors in industry contribute to the emission. Additionally, industry sector remains the major sector with more than 40 per cent of share in total consumption of electricity (Table 3, Annexure).

Now, as per the latest Industrial energy emission estimates 2005 – 2018 by Council on Energy, Environment and Water (CEEW) at GHG Platform India (GHGPI), the major manufacturing sectors that have been largely contributing to emission are chemical and fertilizers, iron and steel, non-ferrous metal, non-metallic minerals (cement), and petroleum refineries. In industry, SCBs' credit exposure to the majorly emitting sectors, during last five financial years is exhibited in Table 4 of the enclosed Annexure.

It shows that in power sector the annual growth of outstanding credit reduced to 1.3 per cent in 2022-23 (7.8 per cent in 2021-22) and is equivalent to that was in 2019-20. In chemical and fertilizers sector too, the annual growth in outstanding credit is reduced during 2022-23.

However, there is an increase in the annual growth rate of outstanding credit to petroleum, coal products and nuclear fuels; chemicals and chemical products; cement and cement products; and basic metal and metal products in the financial year 2022-23.

The SCBs' credit exposure to renewable energy sector under priority sector lending, increased to 4,670-rupee crore as of March 2023, from 1,688-rupee crore as of March 2019, as per Handbook of Statistics on the Indian Economy, 2022-23, published by RBI. For these SCBs, the maturity profile of their loans and advances is given below in Table 4.

More than 60 per cent of the total outstanding loans and advances have the original maturity of less than three years during past five years.

Table 4: Maturity profile of loans and advances given by scheduled commercial banks.

Year	Less than or equal to 3 years	Share in total loans and advances	Over 3 years to 5 years	Over 5 years	Total of loans and advances
2022-23	91,98,059	64	19,04,057	32,17,239	1,43,19,355
2021-22	76,53,235	63	17,36,146	28,09,389	1,21,98,769
2020-21	69,30,423	64	15,01,809	23,74,149	1,08,06,381
2019-20	68,74,505	67	11,70,242	22,62,312	1,03,07,059
2018-19	65,25,742	67	12,00,069	19,82,939	97,08,749

Source: Handbook of statistics on the Indian economy, 2022-23, RBI.

Lastly, in this section, the case studies of two Domestic Systemically Important Banks (D-SIBs) as per RBI viz. HDFC Bank Ltd and State Bank of India (SBI) and one top ranking private player as per the rankings given in Table 3 above, viz. Yes Bank, are put forth to reveal how they have opted for important steps towards transition and their recent progress in this area.

5.1. HDFC Bank Ltd

The bank has implemented an ESG policy framework and to manage associated risks [10]. Energy and emissions along with the disposal of waste is the bank's focus area for making strategies to reduce climate risk due to its own operations. Additionally, the environmental and social risks assessment is integrated with the bank's credit appraisal and approval process. The large industrial portfolios are evaluated using their own Social & Environment Management System (SEMS) framework. The bank has started disclosing its ESG performance from 2014 onwards, in its Sustainability Report. It also publishes various reports like annual Business Responsibility Report, Integrated Report, Annual Report etc., in which the bank discloses various types of statistics regarding climate risk management. This way the bank has made its public disclosure related to climate change more transparent and assessable. The bank also has an independent third-party assurance on its ESG disclosures. Following are the key tenets of the bank in its environmental response (Figure 1).

**Figure 1:** Key principles of HDFC bank.

Source: Integrated report 2022-23, HDFC bank.

The bank's GHG emission intensity in FY 2022-23, reduced by 11 per cent (Y-o-Y basis), per full time employee and per crore of income (Figure 2). It has financed the loans of 15,115 INR

crores in renewable energy sector. Additionally, less than 1 per cent of bank's total exposure comes from fossil fuels and their mining/extraction. It has also covered more than 1400 corporate projects under ESG and climate assessment, and their cumulative outstanding funding by the bank stands at 3,68,328 INR Crores.

Further, the bank has also set an ambitious target to achieve net zero carbon emission by 2032. HDFC bank's balance sheet size increased by 19.2 per cent in FY 2022-23 and GNPA reduced to 1.12 per cent as compared to 1.17 per cent in FY 2021-22 (Figure 2). It may be stated that the HDFC bank continued to grow at a robust pace considering its responsibilities towards environment. Slowly, it will be a major participant in India's transition to low carbon economy if attains the net zero emission target by 2032 as set by it. Additionally, after its merger with the Housing Development Finance Corporation (HDFC) on July 1, 2023, the HDFC bank has become the fourth largest bank in the world from market capitalization perspective [11].

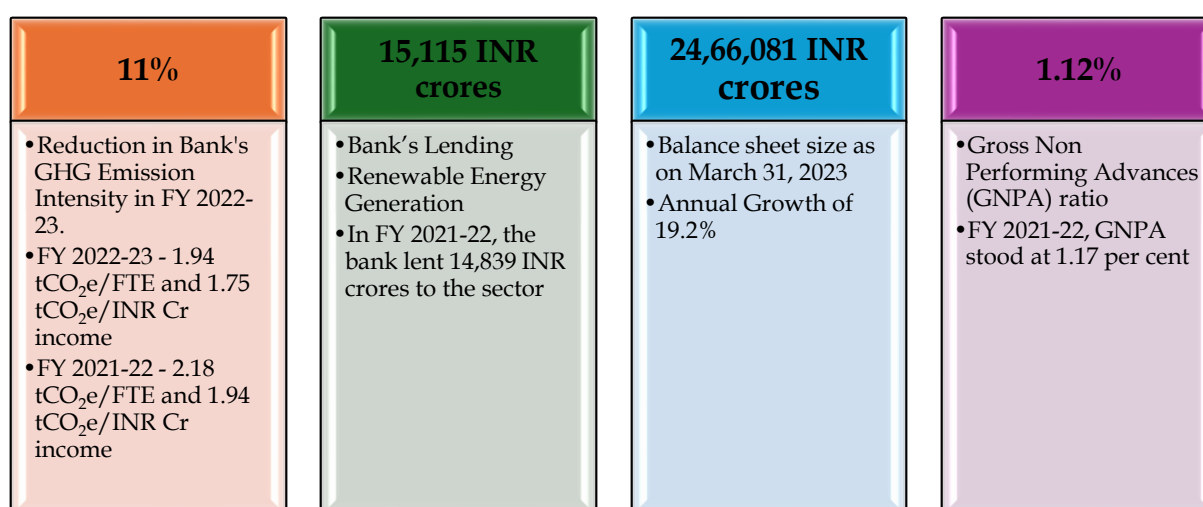


Figure 2: Key environmental performance areas of HDFC bank.

Source: Integrated report 2022-23, HDFC.

5.2. State Bank of India (SBI)

SBI has come forward with the climate change risk management policy in year 2021-22 with the objective of guiding the bank for climate robust operations and investments and cautiously smooth transition towards low carbon operations. As per the policy there will be the major role played by its central board and executive committees of bank at senior management level.

In FY 2022-23, the Bank has also set up the ESG framework. The chairman of SBI, also stated that the bank will explore in the coming years, specific sectors recognized under Production Linked Incentive (PLI) scheme, renewables as well as electric mobility to diversify the portfolio for lending opportunities.

As per the sustainability and business responsibility policy of the bank (updated in 2021), the bank is aiming at integrating its sustainability strategy with its business strategy.

The bank is also committed to reduce carbon emissions due to its own operations. The bank

sanctioned the funds of 36,243 INR crores towards renewable energy projects. The bank also concluded its largest inaugural syndicated social loan by raising 1 billion USD which is the largest ESG borrowing by commercial bank in Asia-Pacific market. Additionally, the bank has set a target to achieve net zero carbon emission by 2030 due to its own operations. The bank's total assets grew by 10.6 per cent in FY 2022-23 on yearly basis. The net profit of the bank also grew at robust pace by 58.6 per cent on yearly basis (31,676 INR crores in 2021-22 and 50,232 INR crores in 2022-23). The bank's GNPA reduced to 2.78 per cent in FY 2022-23 (3.97 per cent in 2021-22 and 10.91 per cent in 2018-19) [12].

5.3. YES Bank

The bank has instituted the Environment and Social Risk Management System (ESMS) which integrates its Environment and Social (E&S) with the business actions, to evaluate and mitigate E&S risk in its financing activities. The system identifies the lending options with both financial prudence and E&S sustainability.

The system also assesses the environmental and social issues of importance that need to be resolved, and realises the feasibility of environmentally & socially preferable project alternatives, that is the system assists bank in evaluating the high value transactions that carry high Environmental, Social and Governance (ESG) risks, etc. The bank has also adopted 360 degrees viewing model which is targeting their four main aspects of business which are given below in the Figure 3.

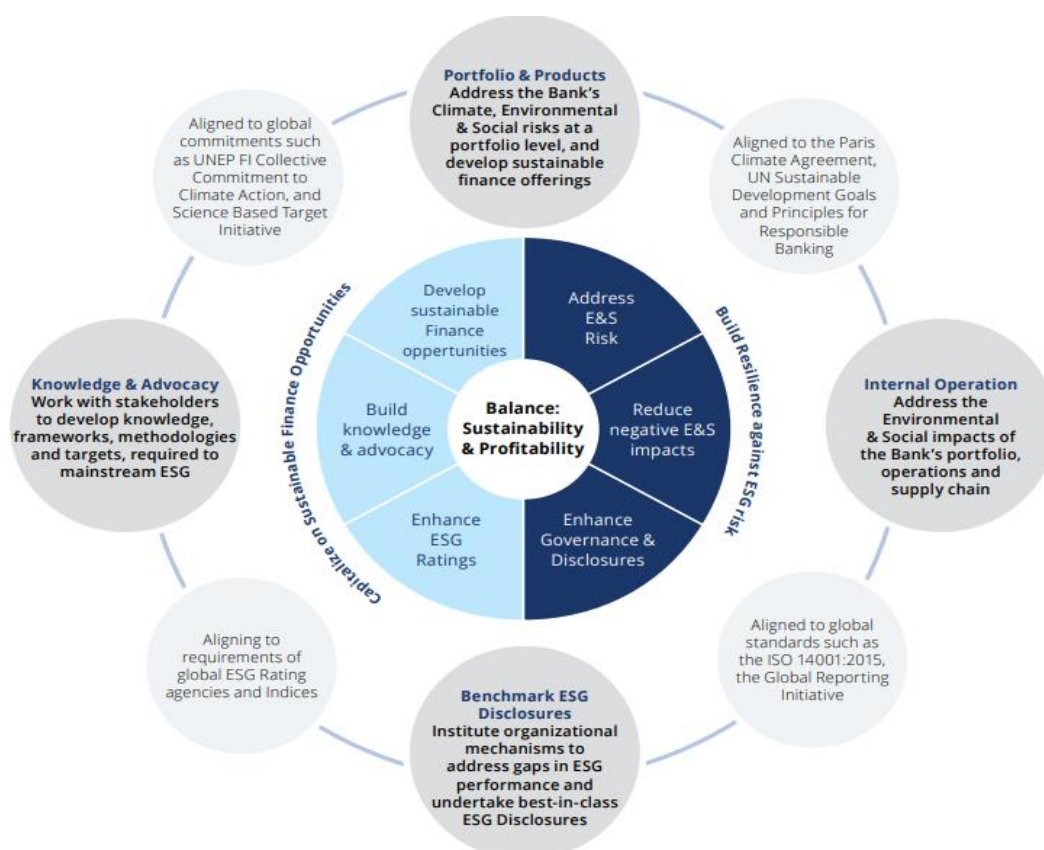


Figure 3: YES bank's sustainability approach.

Source: Sustainability report FY 2021-22, YES Bank.

With this approach, the bank has also increased the extent of public disclosures related to emissions by its internal operations, by its financial activities in energy generation portfolios, regarding the state wise estimated positive impact on carbon emission reduction and much more. Additionally, bank has also set a net zero emission target from its operations by 2030 for itself. If presented in the form of statistics, such efforts of bank have resulted in the following improvements which are given below in Chart 2, as per its first Integrated Annual Report for FY 2022-23 [13].

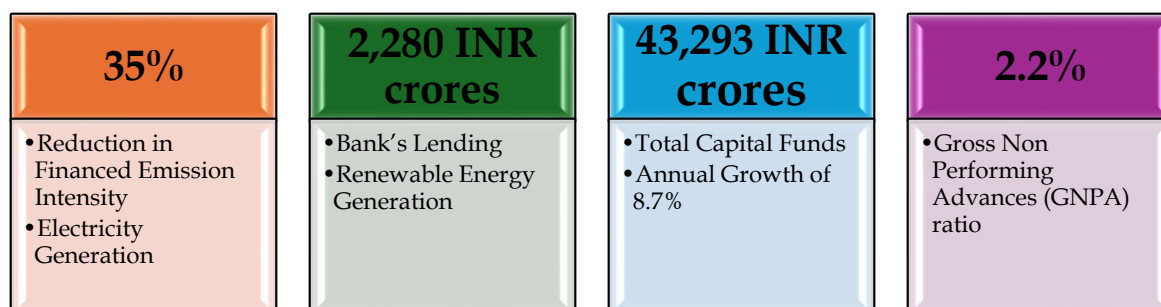


Figure 4: Improvements by Yes Bank during FY 2022-23.

Source: Integrated annual report of for FY 2022-23, Yes Bank.

The bank has slashed the emission intensity of electricity generation portfolio by 35% in FY 2022-23 as compared to the previous financial year. During the FY 2022-23, the bank's lending for renewable energy generation stood at 2,280 INR crore. Its total capital funds at market value were increased by 8.7 per cent and stood at 43,923 INR crores as of March 31, 2023 (from 40,394 INR crores as of March 31, 2022) with a declined Gross Non-Performing Advances (GNPA) ratio of 2.2 per cent (from 13.9 per cent as of March 31, 2022). These banks have remained proactive towards achieving the net zero carbon emission and public disclosure of the related facts. However, for smaller banks for running in this line of race is less equipped because of their own structural and technological issues within the organization. However, they may not be able to remain out of the race for a longer time horizon due to the recently issued guidelines by RBI on 'Disclosure framework on climate-related financial risks, 2024'.

6. Role of Reserve Bank of India (RBI)

The Reserve Bank of India has a crucial roleplay in preparing the banks for transition. Its enthusiastic but prudent role is demanded in this area as all the banks being the regulated entities must rely upon RBI for guidance to assess climate related financial risks as well as common reporting standards.

In this context, RBI as a central bank has already been engaged in many international fora like Basel Committee on Banking Supervision's Task Force on Climate-related Financial Risks (TFCR) and the Network for Greening of the Financial System (NGFS). Further in this regard, RBI had also come up with a discussion paper on Climate Risk and Sustainable Finance [14], in July 2022, which was intended to prepare a strategy to manage climate risk, based on the best practices globally. The discussion paper brought forward broad guidance for all the regulated entities, to have (i) appropriate governance, (ii) strategy to address climate risk, (iii) risk management structure to effectively assess and mitigate them from a micro prudential viewpoint.

It also discussed about the main challenges in integrating the climate risk framework with the lending and investments decisions/approvals made by banks and suggested on plausible implementation of stress testing and climate scenario analysis to recognize and evaluate the vulnerabilities involved in the projects to be undertaken. But there were some issues in implementing the stress testing and scenario analysis for assessing the climate change risks and they were also explained in the discussion paper [14]. It also suggested the regulated entities to follow a common disclosure framework viz., Task Force on Climate-related Financial Disclosures (TCFD) framework which was set up by the Financial Stability Board (FSB) in 2017. In July 2022 only, another survey report by RBI was published on the Survey on Climate Risk and Sustainable Finance [16] conducted by Sustainable Finance Group (SFG) in the Department of Regulation (DoR) of RBI. The survey was conducted in January 2022, to evaluate the progress made by the participating banks related to climate risk and sustainable finance. It concluded that banks have begun stepping into the area of climate risk and sustainable finance, but there is a need for more concrete endeavor and actions in this regard for which regulatory and supervisory approach of RBI will be helpful. Subsequently, a bulletin article appeared in January 2024, in RBI bulletin, which emphasized on stress testing and scenario analysis as an emerging tool for gauging the impact of climate related risks [15]. The article published the result of the pilot study for select banks on climate vulnerability assessment and stress test which was exercised in 2022. It concluded that results depicted a substantial increase in the credit loss potential of banks due to climate change (both physical as well as transition risks). Further and more recently in February 2024, the RBI has come forward with a draft of standard Disclosure Framework on Climate Related Financial Risk [17].

The guidelines in this draft will be applicable to all the regulated entities including (a) All Scheduled Commercial Banks (excluding Local Area Banks, Payments Banks and Regional Rural Banks) (b) All Tier-IV Primary (Urban) Co-operative Banks (UCBs) (c) All All-India Financial Institutions (viz. EXIM Bank, NABARD, NaBFID, NHB and SIDBI) (d) All Top and Upper Layer Non-Banking Financial Companies (NBFCs). The RBI's requirements in this draft are aligned with the Network for Greening the Financial System (NGFS's) guidelines and those of European and other Asia Pacific jurisdictions like Hong Kong, Singapore, and Australia, encompassing measurement and disclosures for Scope 1, Scope 2, as well as Scope 3 GHG risks. These disclosures apply in addition to the disclosures that are already required by the SEBI's Business Responsibility and Sustainability Reporting (BRSR) Framework. Integrating climate risk into credit risk assessment processes is crucial, as is establishing a governance framework for managing Environmental, Social, and Governance (ESG) risks. Additionally, scenario analysis plays a pivotal role in evaluating financial risks stemming from climate change.

7. Conclusion

Summarising the above facts and evaluations in previous sections, set forth the author to conclude that transition may cause financial turbulence (even the financial vulnerability) if the associated risk is not properly assessed and mitigated. However, for a developing nation like India, transition is a slow and gradual process. Indian banks (particularly major SCBs) have already opted for few initial but important steps towards disclosures and assessment of financial risk related to transition and rest others will be initiating soon under the guidance of RBI which has recently come forward with a draft of standard framework for disclosures of climate related financial risks by all the regulated entities (except local area banks, payment banks and regional rural banks). This will fill the data gap and REs may well assess or tracked

for compliance. Therefore, it may be concluded that the Indian banks are unceasingly walking towards preparedness for transition.

8. Future Course of Action

This study lacks in the empirical investigation of the preparedness of the Indian banks due to the unavailability of the related data for all the banks/REs. The same may take as a future trajectory of the investigation.

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Annexure File

Table 1: State-wise number of villages electrified.

Sl. No.	States/ UTs	No. of villages as per 2011 Census	Villages electrified as on 31.3.2022	Villages electrified as on 31.03.2023
1	Andhra Pradesh	16158		
2	Arunachal Pradesh	5258		
3	Assam	25372		
4	Bihar	39073		
5	Chhattisgarh	19567		
6	Goa	320		
7	Gujarat	17843		
8	Haryana	6642		
9	Himachal Pradesh	17882		
10	Jammu & Kashmir	6337		
11	Jharkhand	29492		
12	Karnataka	27397		
13	Kerala	1017		
14	Madhya Pradesh	51929		
15	Maharashtra	40956		
16	Manipur	2379		
17	Meghalaya	6459		
18	Mizoram	704	All villages have been electrified	
19	Nagaland	1400		
20	Odisha	47677		
21	Punjab	12168		
22	Rajasthan	43264		
23	Sikkim	425		
24	Tamil Nadu	15049		
25	Telangana	10128		
26	Tripura	863		
27	Uttar Pradesh	97813		
28	Uttarakhand	15745		
29	West Bengal	37463		
30	Andaman & Nicobar	396		
31	Chandigarh	5		
32	Dadar & Nagar Haveli	65		
33	Daman & Diu	19		
34	Delhi	103		
35	Lakshadweep	6		
36	Puducherry	90		
Total		597464		

Source: Energy statistics 2024, Ministry of Statistics and Programme Implementation (MoSPI).

Table 2: Sector-wise national GHG emission in MtCO₂e for 1994-2016.

GHG Sources and Removals	1994	2000	2007	2010	2014	2016
	Mt CO ₂					
Source	INC	SNC	SNC	BUR-1	BUR-2	BUR-3
Energy	744	1027	1374	1510	1910	2129
Industrial processes and product use	103	89	142	172	202	226
Agriculture	344	356	373	390	417	408
LULUCF	14	-223	-177	-253	-301	-308
Waste	23	53	58	65	78	75
Total (without LULUCF)	1214	1524	1947	2137	2607	2839
Total (with LULUCF)	1229	1301	1772	1884	2306	2531

Source: Biennial Update Report (BUR)_III, 2021.

Table 3: Year and sector wise consumption of electricity.

Year	Industry	Agriculture	Domestic	Commercial	Traction & Railways	Others	Total electricity consumed
1	2	3	4	5	6	7	8=2 to 7
2017-18	4,68,613	1,99,247	2,73,545	93,755	17,433	70,834	11,23,427
2018-19	5,19,196	2,13,409	2,88,243	98,228	18,837	72,058	12,09,972
2019-20	5,32,820	2,11,295	3,08,745	1,06,047	19,148	70,031	12,48,086
2020-21	5,08,776	2,21,303	3,30,809	86,950	14,668	67,701	12,30,208
2021-22	5,56,481	2,28,451	3,39,780	97,121	21,935	72,996	13,16,765
2022-23(P)	5,95,000	2,40,800	3,62,000	1,05,100	25,000	75,500	14,03,400
% share in 2022-23(%)	42.4	17.16	25.79	7.49	1.78	5.38	100
Growth rate of 2022-23 over 2021-22(%)	6.92	5.41	6.54	8.22	13.97	3.43	6.58

(P): Provisional. **Source:** Energy Statistics 2024, Ministry of Statistics and Programme Implementation (MoSPI).

Table 4: Industry wise deployment of bank credit of scheduled commercial banks.

Sr. No	Sector	Outstanding as on last reporting Friday in march					Y-O-Y Growth (%)			
		2018-19	2019-20	2020-21	2021-22	2022-23	2019-2020	2020-21	2021-22	2022-23
1	Petroleum, Coal products and Nuclear fuels	75,395	79,997	79,174	1,08,746	1,49,962	6.1	-1	37.4	37.9
2	Chemicals and Chemical products	1,71,925	1,98,941	1,84,953	2,04,740	2,25,174	15.7	-7	10.7	10
2.1	Fertiliser	37,630	47,068	32,414	33,943	34,680	25.1	-31.1	4.7	2.2
2.2	Drugs and Pharmaceuticals	50,733	56,342	54,077	64,755	71,058	11.1	-4	19.7	9.7
2.3	Petro chemicals	22,967	26,486	28,012	19,775	20,844	15.3	5.8	-29.4	5.4
2.4	Others	60,595	69,045	70,450	86,267	98,592	13.9	2	22.5	14.3
3	Cement and Cement products	56,986	61,054	57,610	49,338	58,244	7.1	-5.6	-14.4	18.1
4	Basic metal and Metal product	3,71,755	3,35,099	3,05,457	2,96,252	3,52,218	-9.9	-8.8	-3	18.9
4.1	Iron and Steel	2,87,648	2,51,225	2,18,853	1,92,592	2,35,399	-12.7	-12.9	-12	22.2
5	Construction	1,11,937	1,27,838	1,19,670	1,22,455	1,27,186	14.2	-6.4	2.3	3.9
6	Infrastructure	10,44,199	10,83,656	10,95,467	12,05,737	12,12,238	3.8	1.1	10.1	0.5
6.1	Power	5,69,857	5,77,327	5,71,028	6,15,806	6,23,918	1.3	-1.1	7.8	1.3
	Total Industry (includes other sectors too which are not displayed)	28,37,528	29,46,851	29,34,689	32,35,279	34,16,353	3.9	-0.4	10.2	5.6

Source: Handbook of statistics on the Indian economy, 2022-23, RBI.