



Strengthening climate risk assessment and enabling central bank supervision in the Indian financial sector

2023-24

Skill enhancement program for frontrunning Indian banks

Day 1: Integration and operationalization of climate risks within banks

- 1 Context setting
- 2 Climate risk management at the organizational level
- 3 Climate & conventional financial risks
- 4 GESI risks & opportunities

Day 2: Net zero transition and decarbonization planning within banks

- 1 Context setting
- 2 Transition planning process, including financed emissions
- 3 Transition finance strategies and products
- 4 Reporting for credible transition plans

Connecting the dots between climate risks and transitioning to a decarbonised portfolio

Namita Vikas, Founder & Managing Director



An award-winning senior business leader with over 32 years of diverse global experience in sustainable finance, ESG, and climate strategy across banking and technology. Previously held a CXO position with a large Indian private bank, and issued the maiden green bond and launched several innovative first-of-its-kind sustainable finance products. Was instrumental in raising over USD 1 billion in green capital from marquee global DFIs. In 2020, founded auctusESG towards accelerating global sustainable finance and climate transition.

Has been steering marquee global projects awarded by international governments, UN agencies, and global DFIs in emerging markets like Latin America, Central Asia, Southeast Asia, India, and Africa. Namita continues to be a member of several expert committees on Sustainable Finance and ESG, including those by Government of India, and International Organization for Standardization (ISO). Currently, she serves on the global advisory board of Climate Bonds, UK, Finance Industry Advisory Board of International Energy Agency (IEA), WoTR, India and Digital Green, USA.

Smitha Hari, President (India)



Finance professional with over 18 years of corporate and entrepreneurial experience. She holds certification in Sustainability and Climate Risks from GARP. Worked across corporate banking, investment banking, sustainable finance, ESG, & impact investing with IndusInd Bank, ING, EY, Marsh & McLennan & Spark Capital. Specialises in product structuring, financial analysis and research in sectors such as financial services, clean energy, skilling and livelihood, and agriculture. At auctusESG, as head of India operations, leads projects, research, people, and stakeholder management.

Sourajit Aiyer, Vice President



Finance and sustainability professional with 16+ years of experience, with Motilal Oswal Financial Services, UBS Investment Bank London, Evaluateserve, Grameen Capital, UNEP's Sustainable India Finance Facility & in independent projects. Authored 3 books on regional economies and ~170 articles on sustainability, business, and finance. Holds certifications in ESG Investing (CFA Institute), Sustainability & Climate Risks (GARP), Climate Risks (Chartered Banker Institute), Sustainability (ICAEW), Business & Net Zero Emissions (Cambridge CISL), Responsible Business (IICA) & Climate Scenario Analysis (PRMIA).

Sudha Meiyappan, Assistant Vice President



An economist with a decade of experience in macroeconomic analysis with an interdisciplinary approach including political and environmental issues. Worked on international trade policy, country risk analysis, predictions for commodity prices, exchange rate and inflation for emerging and mature economies through work at Washington DC and for TAC Economics. Also a member of the Economic Affairs Committee of South Indian Chamber of Commerce. At auctusESG, oversees projects, research and forms partnerships.

Context setting

- *Types of climate risks*
- *Transverse nature of climate risks*
- *Developments on climate risk policies and regulations*
- *Leveraging climate opportunities*

Criticality of climate risks from banking lens

Climate-related financial risks refer to the potential risks that may arise from climate change or from efforts to mitigate climate change, their related impacts and their economic and financial consequences (*Basel Committee*)

India lost \$4 bn to extreme weather last year

[\(Deccan Herald, 2023\)](#)

Climate Risks are Financial Risks: Helping Big Banks Prepare

[\(Natural Resources Defense Council, 2023\)](#)

Climate Change Is Exacerbating Inflation Worldwide

[\(Scientific American, 2023\)](#)

Banking Sector Risk in the Aftermath of Climate Change and Environmental-Related Natural Disasters

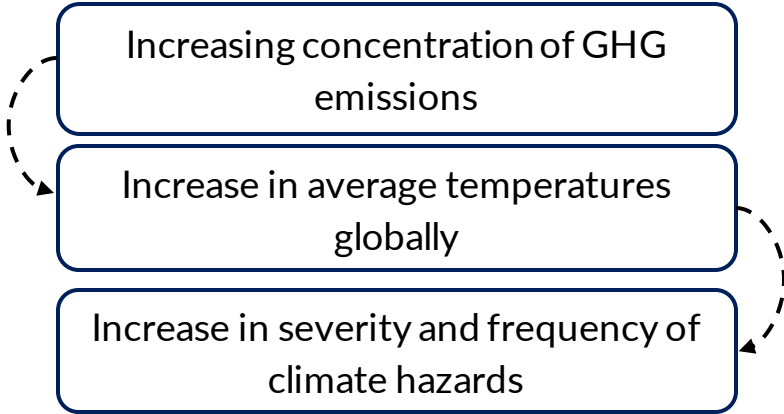
[\(World Bank paper, 2023\)](#)



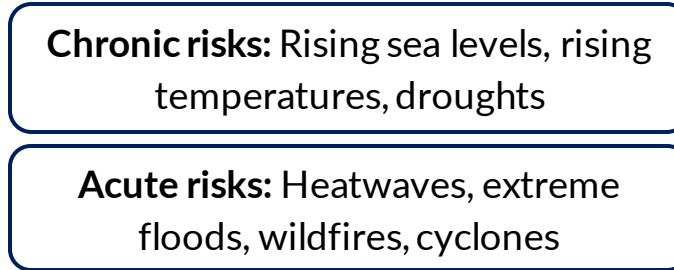
[\(Business Today, 2023\)](#)

Physical risks of climate change

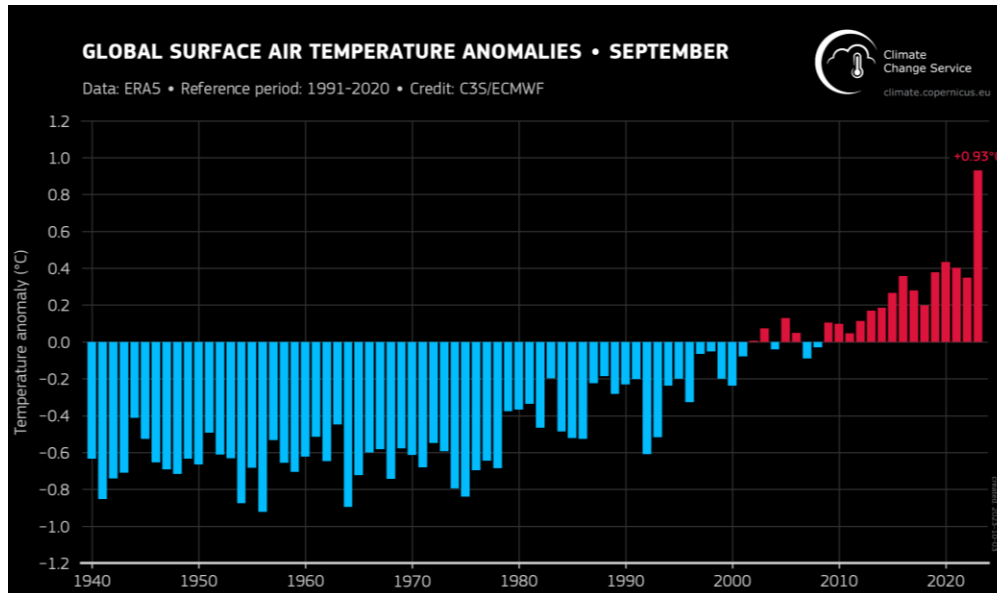
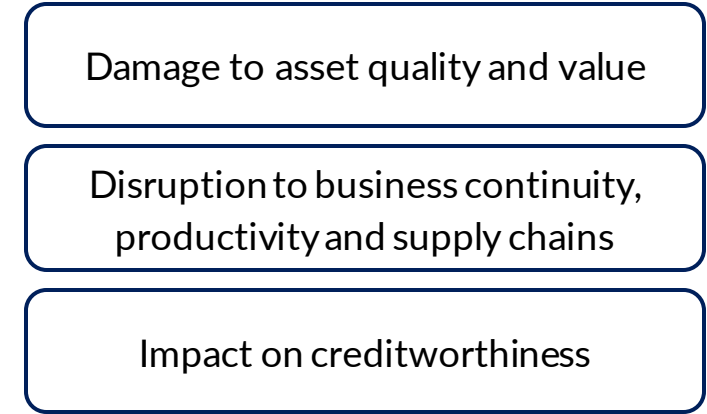
Drivers



Risks



Material impact



[\(Copernicus, 2023\)](#)

2023 on track to be the warmest year on record

[\(Copernicus, 2023\)](#)

Transition risks of climate change

Drivers

Arising from the process of adjusting towards a low-carbon economy

Increase in average temperatures globally

Risks

Policy shifts: Shift away from fossil fuels, climate stress tests

Technological changes: Superseding technology, rising operational costs

Sentiment: Declining demand for carbon-intensive products, shareholder activism

Material impact

Increase in stranded assets

Rise in capital expenditure

Impact on creditworthiness

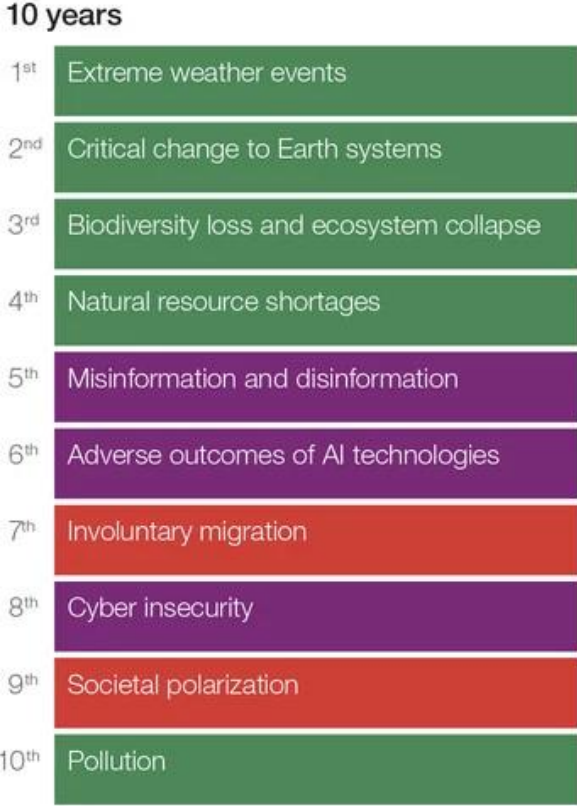
India govt panel proposes ban on diesel 4-wheeler vehicles by 2027

[\(Reuters, 2023\)](#)



Global risk landscape

Top 10 global risks



Risk categories | Economic | Environmental | Geopolitical | Societal | Technological



Transverse nature makes climate risks a business rationale

Climate risks

Physical risks

- **Acute** (floods, wildfires, cyclones)
- **Chronic** (rising sea levels, food insecurity, changes in precipitation)

Transition risks

- **Policy shifts** (carbon pricing, renewable targets, bans on ICEs)
- **Technological changes** (cost-effective solar, wind, EVs)
- **Sentiment** (green labelling, vegetarianism, cycling)



Transmission channels leading to economic and business impact

Impact on businesses

- Damage to assets
- Disruption to business
- Stranded assets
- Loss in revenue
- Loss in client base
- Higher opex/capex
- Resource supply issues
- Higher cost of capital
- Tightening profitability

Impact to households

- Loss of income
- Loss of productivity
- Job discontinuity
- Property damage
- Increased costs



Shifts in prices



Change in growth & productivity



Labour market frictions



Financial risks

Credit risk

- Defaults by businesses and households
- Collateral depreciation

Market risk

- Repricing of financial assets

Underwriting risk

- Increased insured losses
- Increased insurance gaps

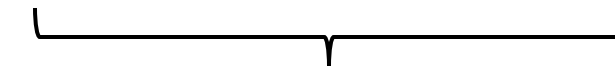
Operational risk

- Facilities & supply chain

Liquidity risk

- Sudden demand for liquidity
- Refinancing risk

Financial system contagion



Economy & financial system feedback loop

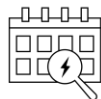
Climate risks: green swan event



Black swan risk events



Uncertain



Unpredictable through historical probabilistic data



Non-linear



Green swan risk events add



High degree of certainty of climate risks materializing



Cascading environmental, geopolitical, social and economic effects



More profound impacts than systemic financial crises

5 notches

Estimated to be the climate-induced sovereign downgrade in India by 2100

US \$4.3 trillion

Valued to be the global economic damage from 1970 to 2021, due to extreme weather, climate and water-related events

18%

Projected to be the loss to global GDP between 2021 to 2050, from climate change if no action is taken

Accounting for 'negative externalities' may completely change the way risk, returns and profits are assessed

Policies and regulations: global & regional

Global level



International Sustainability Standards Board

Basel Committee on Banking Supervision

Regional level



HONG KONG MONETARY AUTHORITY



BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA



BANCO CENTRAL
DO BRASIL



Central Bank of Kenya



Monetary Authority of Singapore



SEBI introduces Core BRSR ESG reporting, tackles unregulated ESG rating providers

[\(Moneycontrol, 2023\)](#)

RBI sets the tone in climate finance thinking with its “Green India” report

[\(ORF, 2023\)](#)

Sebi notifies stronger framework for green bonds; introduces concept of blue, yellow bonds

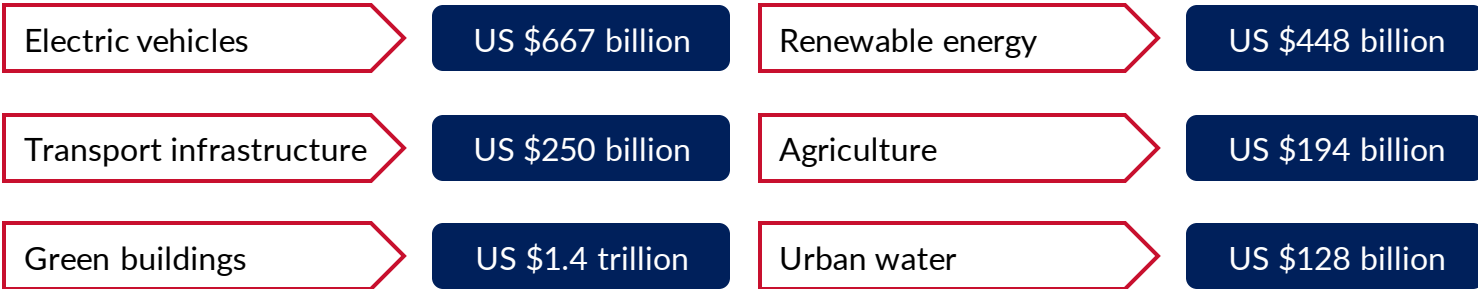
[\(Economic Times, 2023\)](#)

RBI issues framework for acceptance of green deposits by banks, NBFCs

[\(Times of India, 2023\)](#)

Leveraging climate opportunities

IFC report highlights US \$3 trillion climate-smart opportunity pool in India



[\(IFC, 2017\)](#)



Progression of types of financing instruments for emerging sectors





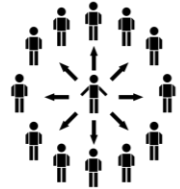

Take home point 1

Regulatory developments on climate risk are demanding that banks take action. At the same time, the need to protect risk-adjusted returns is compelling the market to adapt with speed, given the recurrence of climate incidents. Resultantly, embedding climate-related risk management and business strategies is no longer a good-to-have, but a must-have

Climate risk at the organizational level

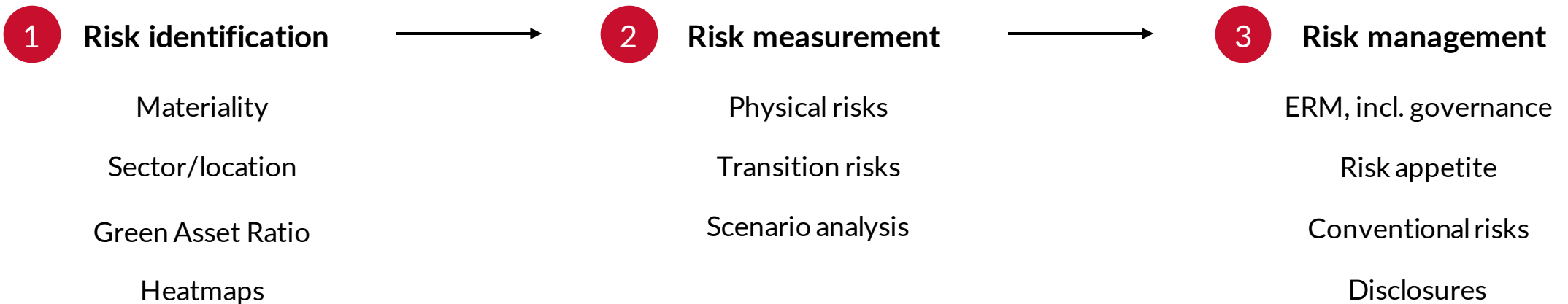
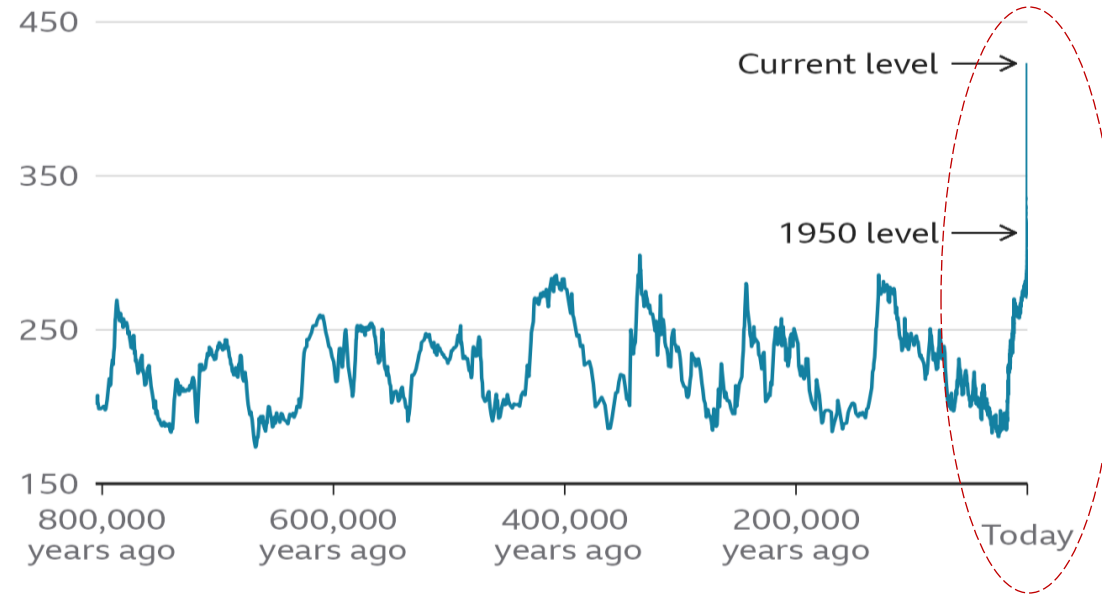
- *Basel principles for climate risks*
- *Climate risk identification*
- *Climate risk measurement*
 - *Transition and physical risk assessment approaches*
 - *Climate scenario analysis & climate stress testing*
- *Climate risk management*
 - *Integrating climate risk within Enterprise Risk Management (ERM)*
 - *Risk appetite framework*
 - *Climate and conventional risks (next module)*

Basel principles for climate risk

	<p>Corporate governance and controls</p>	<p>Business strategies and RMF</p>	<p>Organizational structure</p>	<p>Three lines of defence</p>	<p>Organization-wide policies, procedures and controls</p>
	<p>Risk management processes, monitoring and reporting</p>	<p>Material climate risks in risk appetite framework and RMF</p>	<p>Identify, measure, monitor and manage climate risks</p>	<p>Risk data aggregation capabilities</p>	<p>Internal risk reporting practices</p>
	<p>Understanding the impact on financial risks</p>	<p>Credit risk profiles</p>	<p>Market risk positions</p>	<p>Liquidity risk profiles</p>	<p>Operational and other risks</p>
	<p>Internal capital adequacy and scenario analysis</p>	<p>Quantification of climate risks</p>	<p>Internal capital and liquidity adequacy assessment</p>	<p>Stress testing</p>	<p>Scenario analysis for resilience</p>

Why and what

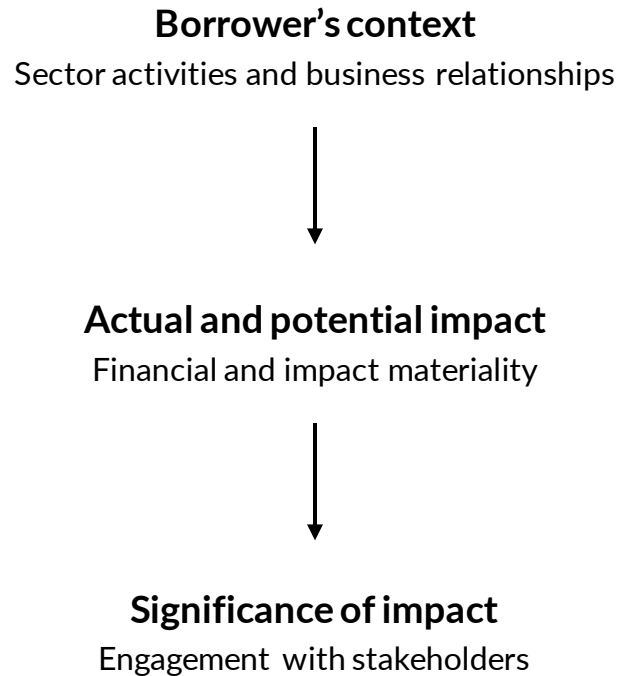
**Atmospheric CO2
ppm levels since history:
where are we today?**



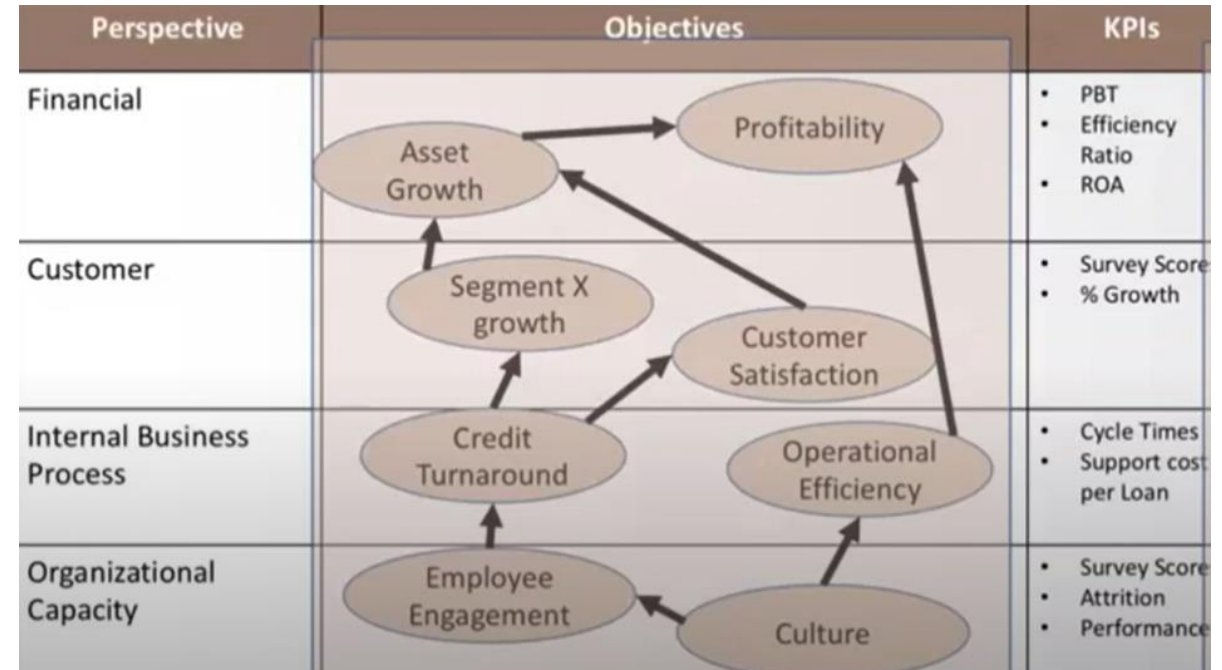
Risk identification: materiality mapping

Information is material if its omission/misstatement could change the assessment or decision of a user relying on that information for making economic decisions [RBI, 2013](#).

Process to determine material factors/topics



Using Balanced Scorecard metrics as a reference



Materiality: climate-forecasting the risk matrix

		Impact				
		Negligible	Minor	Moderate	Major	Catastrophic
Likelihood	Certain				✖ Future date	
	Likely				↑	
	Possible			✖ Present date		
	Unlikely					
	Rare					

Future-oriented, but starting now

Stochastic in nature

Fat-tail risks

Carbon's life in atmosphere

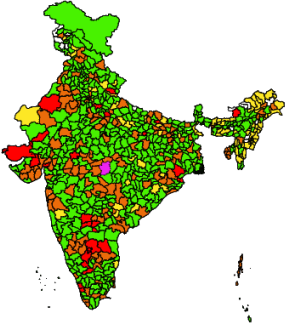
Risk identification: sector & location analysis

Analyzing the impact of vulnerabilities requires taking a micro-look at assets, their concentration mix in the portfolio, the business drivers creating that concentration risk, and at the adaptive capacity

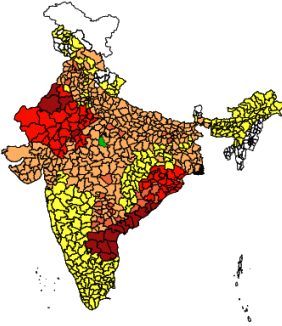
Physical risks → Based on location

Transition risks → Based on sectors and jurisdictions

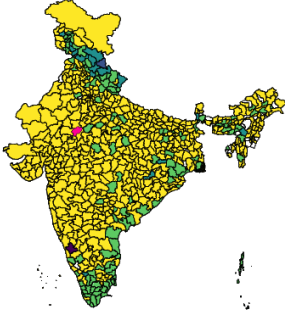
Drought



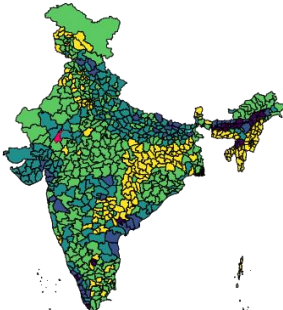
Heatwave



Extreme rainfall

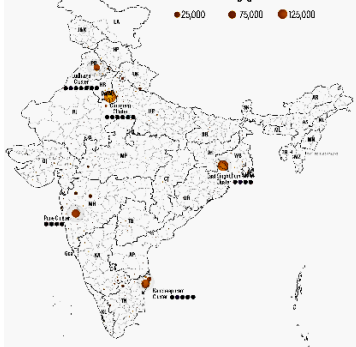


Flood

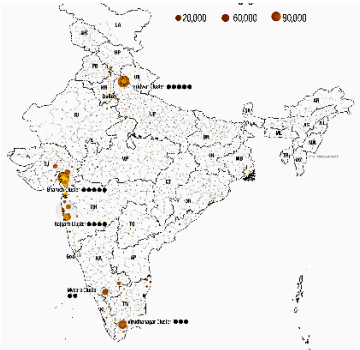


(Indian Meteorological Department Pune, 2023)

Automobile

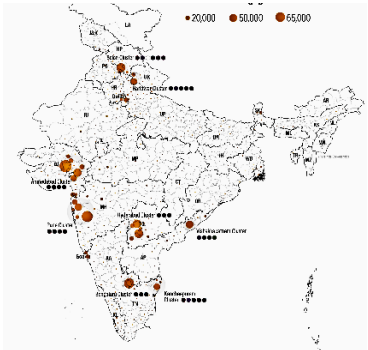


Chemical



(WRI 2023)

Pharma



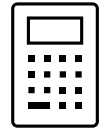
India's vulnerabilities

State	Overall vulnerability index score	Rank
Assam	0.616	1
Andhra Pradesh	0.483	2
Maharashtra	0.478	3
Karnataka	0.465	4
Bihar	0.448	5
Manipur	0.424	6
Rajasthan	0.423	7
Arunachal Pradesh	0.408	8
Sikkim	0.370	9
Odisha	0.368	10

Zone \ Extreme event	Flood	Drought	Cyclone
Northern	High	Medium	Low
Southern	High	High	High
Eastern	High	Medium	High
North-eastern	Medium	Low	Low
Western	Medium	High	Medium
Central	Low	Medium	Low

Risk identification: Green Asset Ratio

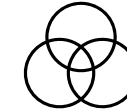
Derived from the EU's work on taxonomy definitions, Green Asset Ratio is used as a KPI to assess the proportion of balance sheet exposure aligned to taxonomy or green-tagged assets



Along with carbon footprint & carbon pricing, it offers another useful way to identify the extent of transition risk



The classification system needs to be common, to allow sectoral comparisons across banks/FIs



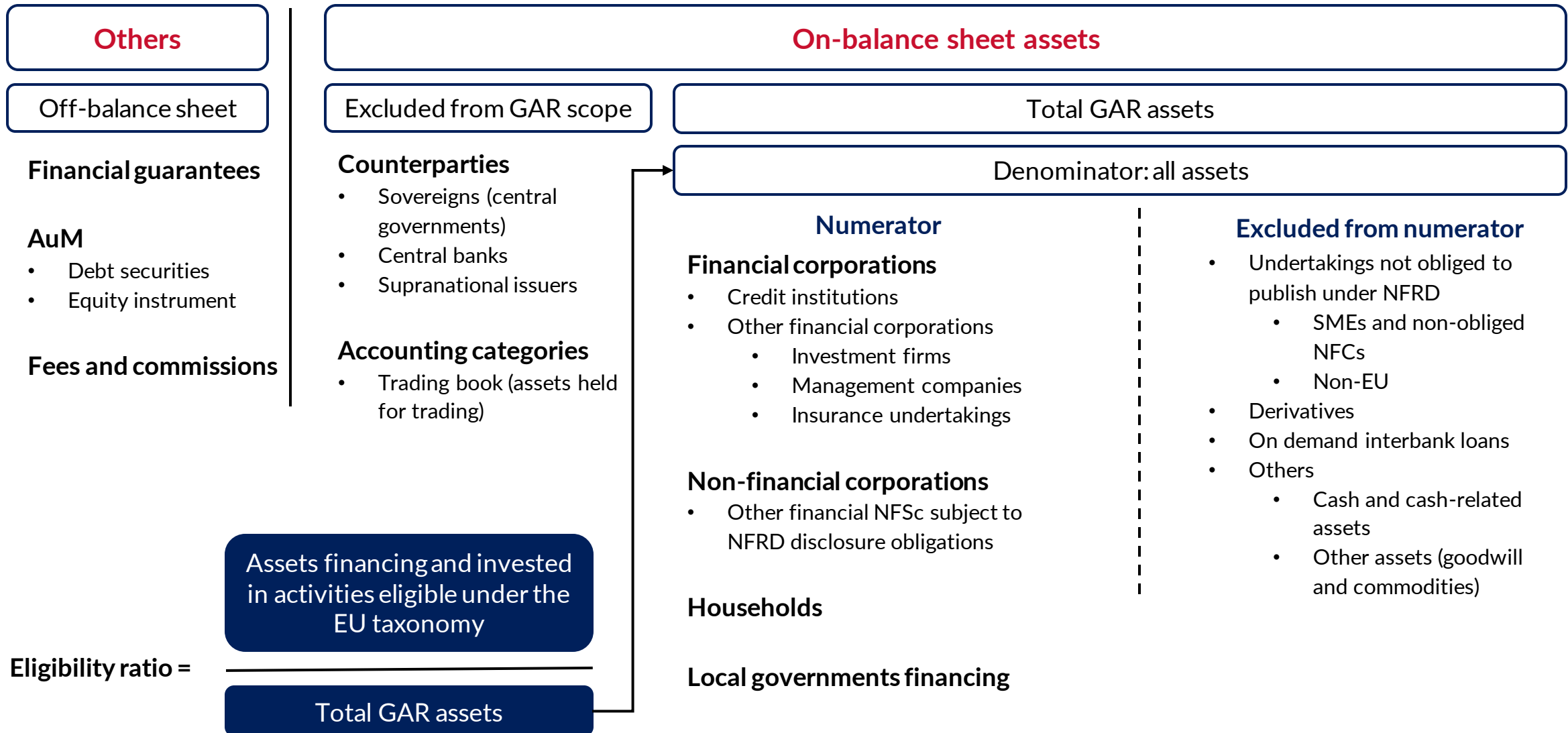
Due to different business models and focus areas, comparison amongst sub-sectors may be more pragmatic

Financing activities that contribute to emission reduction, going beyond divestment and negative screening, and **enabling economies of scale to make them more cost-competitive**

Adopting early action for orderly portfolio alignment, in order to avoid time delays that may lead to disorderly transition



Risk identification: EU's Green Asset Ratio definition




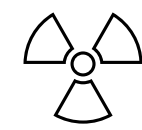
Risk identification: GAR reporting template of EBA

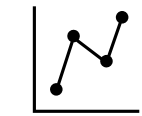
GAR % (compared to total covered assets in the denominator); Disclosure reference date T on stock	Climate Change Mitigation (CCM)				Climate Change Adaptation (CCA)				TOTAL (CCM + CCA)				Proportion of total assets covered
	Proportion of eligible assets funding taxonomy relevant sectors				Proportion of eligible assets funding taxonomy relevant sectors				Proportion of eligible assets funding taxonomy relevant sectors				
	Of which environmentally sustainable				Of which environmentally sustainable				Of which environmentally sustainable				
	Of which specialised lending	Of which transitional	Of which enabling	Of which specialised lending	Of which adaptation	Of which enabling	Of which specialised lending	Of which transitional/a daptation	Of which enabling				
Loans and advances, debt securities and equity instruments eligible for GAR calculation													
Financial corporations													
Credit institutions													
Other financial corporations													
of which investment firms													
of which management companies													
of which insurance undertakings													
Non-financial corporations subject to NFRD disclosure obligations													
Households													
of which loans collateralised by residential immovable property													
of which building renovation loans													
of which motor vehicle loans													
Local government financing													
Housing financing													
Other local governments financing													
Collateral obtained by taking possession: residential and commercial immovable properties													

Risk identification: heatmaps

Heat-maps combine risk classification systems with risk grading criteria to score exposures


 Allows screening of whole portfolios across sectors or geographies


 Allows early indication of where higher risks may lie within a portfolio


 May require granular data to be more specific

Heat-map based on UNEP-FI's exercise with 39 FIs

Sector	Direct Emissions Cost	Indirect emissions cost	Low-carbo capex	Revenue	Overall
Oil and gas	High	Low	Moderately high	High	High
Agriculture	Moderate	Moderate	Moderate	Moderate	Moderate
Real estate	Moderately low	Moderate	Moderate	Moderately low	Moderate
Power generation	Moderately high	Moderate	Moderately high	Moderate	Moderately high
Metals and mining	Moderately high	Moderately high	Moderate	Moderately low	Moderate
Industrials	Moderate	Moderately high	Moderate	Moderately low	Moderate
Transportation	Moderately high	Moderate	Moderate	Moderate	Moderate
Services and technology	Low	Moderately low	Moderately low	Low	Low

(UNEP-FI, 2020)

Risk measurement: physical risk assessment approach

Hazard assessment

- High-probable hazards that may impact sector & location
- Based on stochastic events occurring every 100 years
- Damage function may depend from case-to-case

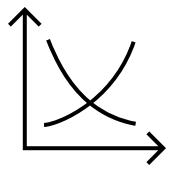
Vulnerability assessment

- Frequency of high-probable hazards occurring
- Severity of impact of high-probable hazards
- Assets, business continuity & resources likely to be impacted

Exposure assessment

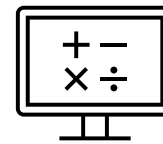
- Extent of assets along the line of high-probable hazards
- Extent of resources along the line of high-probable hazards
- Impact owing to exposure of assets & resources

Probabilistic-based scoring for physical risks



Exceedance Probability Curve

Based on scoring, develop an EP curve of a disaster to show annual probability of exceeding a certain level of loss



Average Annual Loss

Based on scoring and EP, develop the AAL to show the overall expected loss for the entire set of disasters

Case study: Taipei Fubon Bank

Physical risk analysis on mortgage exposures

Taipei Fubon Bank analysed the physical risks to its mortgages at the end of 2021. The bank utilized the RCP 8.5 scenario to assess 126, 719 mortgages.

The bank analysed the physical risk impact on its mortgages using a combination of **hazard, vulnerability, and exposure**.

Hazard

- Under the RCP 8.5 scenario, the likelihood of 650mm/day of rainfall
- Daily rainfall under GCM model for the base period and future RCP 8.5 scenario

Vulnerability

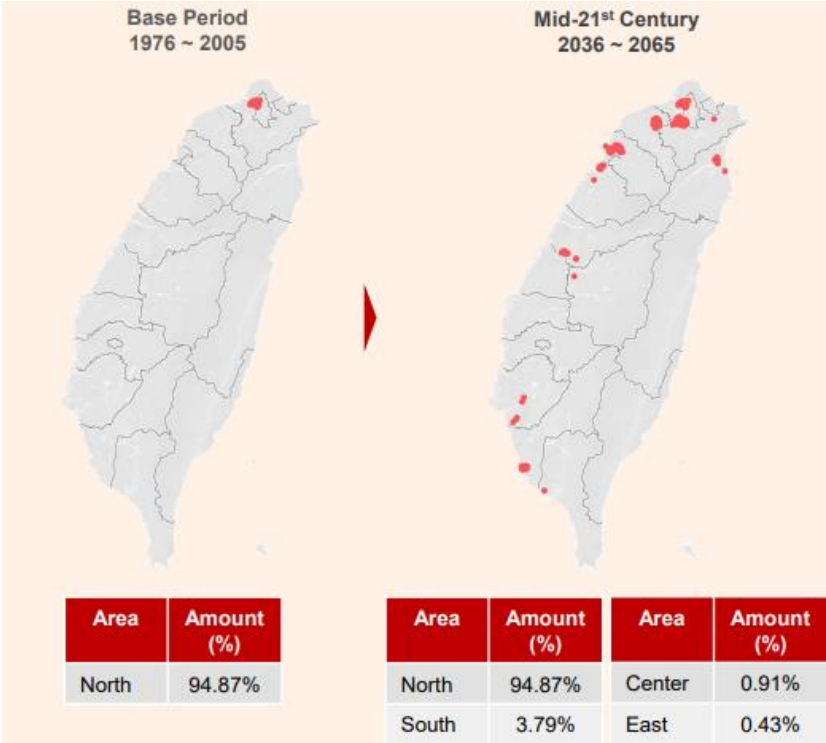
- Potential flooding from 650mm/day rainfall based on Water Resources Agency projection
- Five risk tiers determined by depth of floods

Exposure

- Five risk tiers determined by outstanding mortgage balance

Z-score

$$\int f(Z) dz = \int_a^b \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{z^2}{2}}$$



Risk measurement: transition risk assessment approach

Footprint assessment

- Starts with footprint estimation across 3 scopes
- Financed emissions footprint to highlight high-risk companies
- Both absolute and intensity to reduce for portfolio alignment

Probability of transition risk triggers

- Takes cues from portfolio data
- Probability of policy changes, reducing cost of alternate technologies & changes in target client demand patterns

Carbon price assessment

- Assume based on global trends
- Assume social cost of carbon
- Assume as ratio of emissions per unit of energy
- Impact on ICR
- Assume pass-through % of c-tax

Probabilistic-based scoring for transition risks



Asset/borrower-level calibration

Assessing impact of climate scenarios on asset or borrower may provide room for more mitigation solutions



Implied Temperature Rise

ITR converts benchmark divergence (counterparty's alignment vs. normative benchmark) to a temperature score

Reduce footprint

- Exclude financing of the most harmful activities and technologies
- Work with clients to limit adverse climate impacts through action plans, continual engagement and support

Key activities in 2022

- Onboarded new tools (e.g., Climate Central) to strengthen climate risk assessment at the transactional level
- Communicated our interim climate targets for thermal coal mining and cement sectors to business units, especially the frontliners
- Initiated discussions with selected cement clients regarding our interim climate target and expectations of the sector

Increase handprint

- Finance transition, low-carbon, carbon neutral and carbon negative activities and technologies
- Finance Net Zero clients

Key activities in 2022

- Deployed a team of sustainable finance specialists to identify and build a pipeline of transition and green finance opportunities
- Completed various green and sustainability-linked transactions including with IJM Group (a Malaysia-based property developer)
- Approved around RM40 million worth of financing for SMEs via the BNM Low Carbon Transition Finance Facility (LCTF)

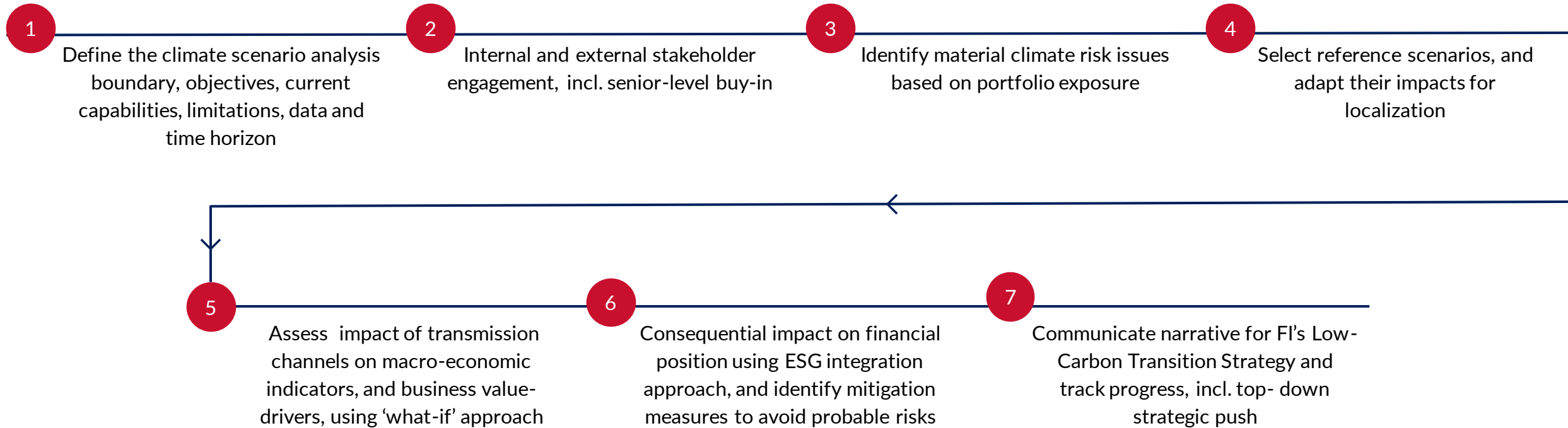
Transform financing portfolio

- Manage overall exposure to carbon-intensive sectors
- Increase portfolio exposure to climate-supporting clients, activities and technologies

Key activities in 2022

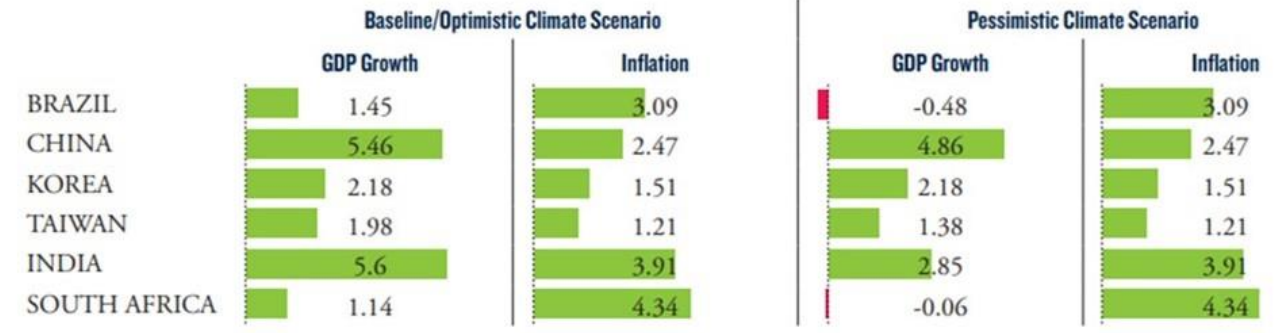
- Incorporated an Overall Sustainability Rating into the Group's 2023 risk posture setting process
- Expanded the sector coverage of PACTA scenario analysis to include cement and steel manufacturing
- Piloted a flood risk assessment on selected mortgages in Malaysia to assess flood implications to property value and delinquency rate among customers

Climate scenario analysis: typical 'what-if' approach



The basis for selecting reference scenarios

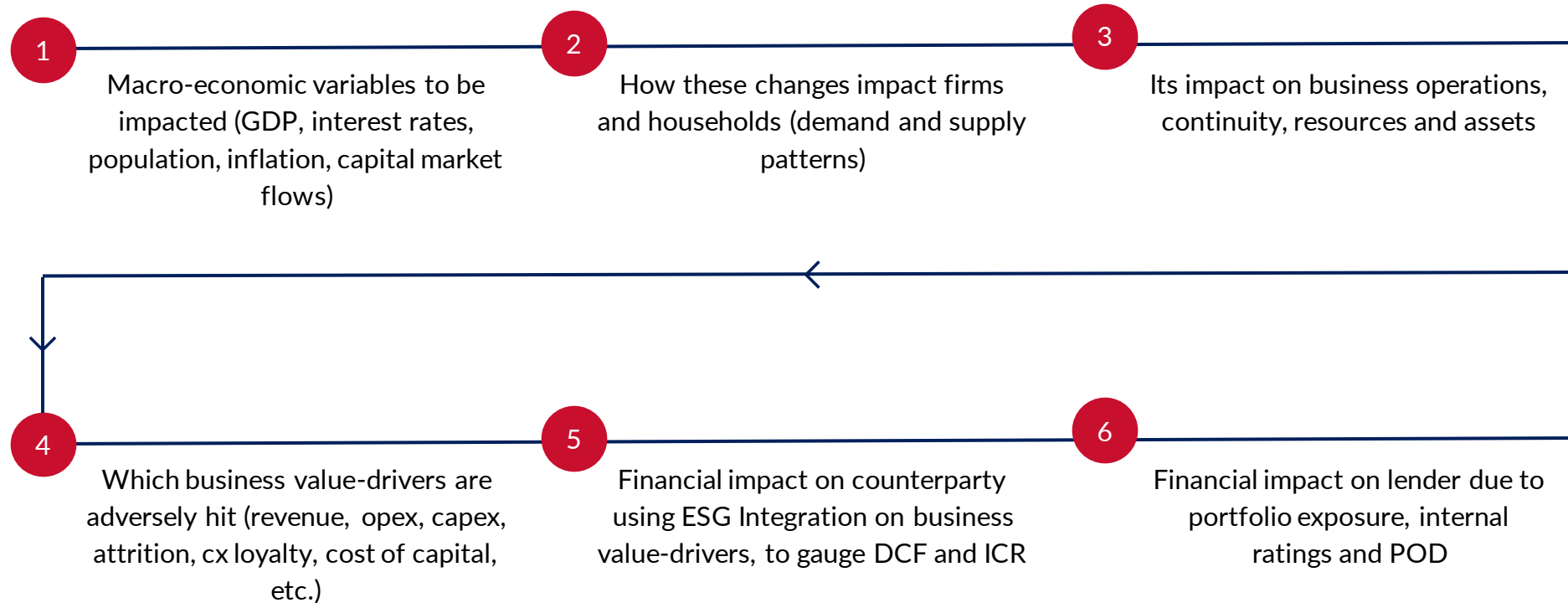
Scenario	Transition risk			
	Policy reaction	Technology change	Carbon dioxide removal	Regional policy variation*
Net Zero 2050	Immediate and smooth	Fast change	Medium use	Medium variation
Below 2°C	Immediate and smooth	Moderate change	Medium use	Low variation
Divergent Net Zero	Immediate but divergent	Fast change	Low use	Medium variation
Delayed transition	Delayed	Slow/Fast change	Low use	High variation
Nationally Determined Contributions (NDCs)	NDCs	Slow change	Low use	Low variation
Current Policies	None – current policies	Slow change	Low use	Low variation



Annual average GDP per capita growth rates.

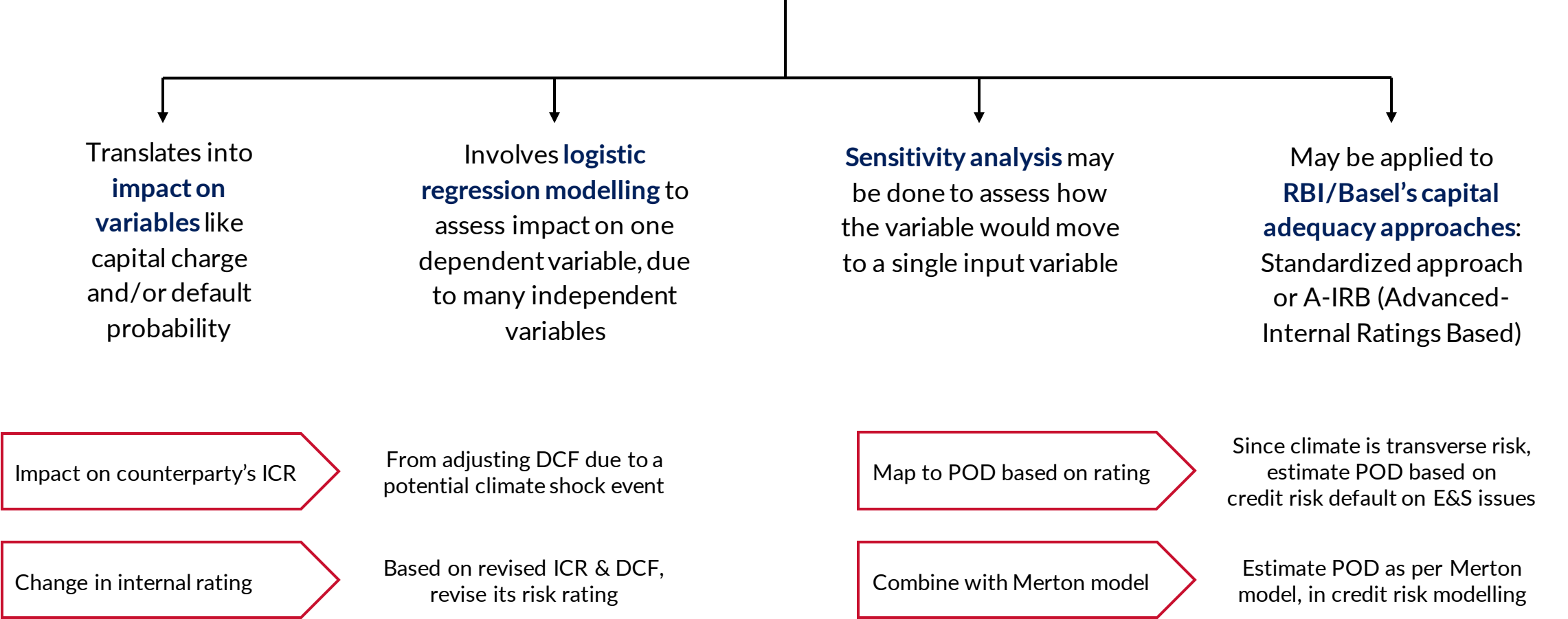
	SSP1			SSP2			SSP3			SSP4			SSP5	
	2010–2040	2040–2100	2010–2100	2010–2040	2040–2100	2010–2100	2010–2040	2040–2100	2010–2100	2010–2040	2040–2100	2010–2100	2010–2040	2040–2100
High income countries	1.3%	0.9%	1.0%	1.4%	0.9%	1.1%	1.1%	0.4%	0.6%	1.5%	0.9%	1.1%	1.5%	1.7%
Middle income countries	4.4%	1.9%	2.8%	4.0%	1.9%	2.7%	3.4%	0.9%	1.8%	4.3%	1.8%	2.7%	4.5%	2.6%
Low income countries	4.2%	3.9%	4.1%	3.7%	3.3%	3.5%	2.7%	1.0%	1.6%	3.3%	1.8%	2.3%	4.0%	4.5%
World	3.0%	1.8%	2.2%	2.7%	1.7%	2.0%	1.9%	0.5%	1.0%	2.7%	1.1%	1.7%	3.1%	2.5%

Assessing impact on macro, business & financial indicators



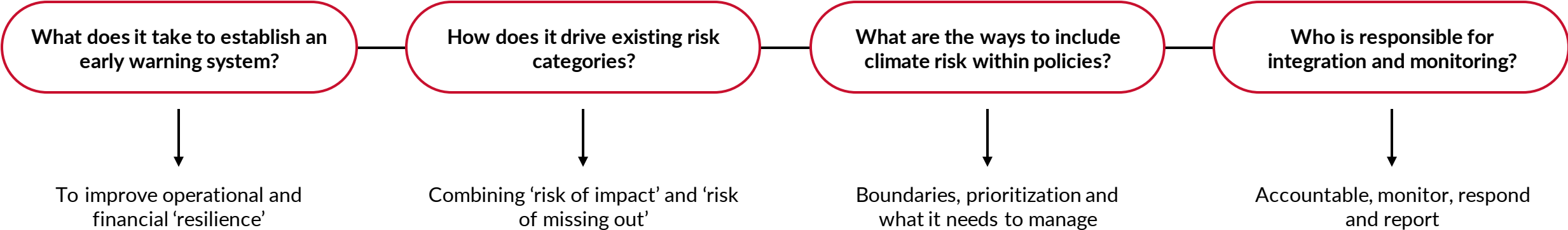
Climate stress testing: worst-case scenario

Extension of climate scenario analysis, to gauge the bank or firm's resilience to the worst-case scenario



Risk Management: considerations for a bank

Integrating climate risks within Enterprise Risk Management (ERM) of a bank



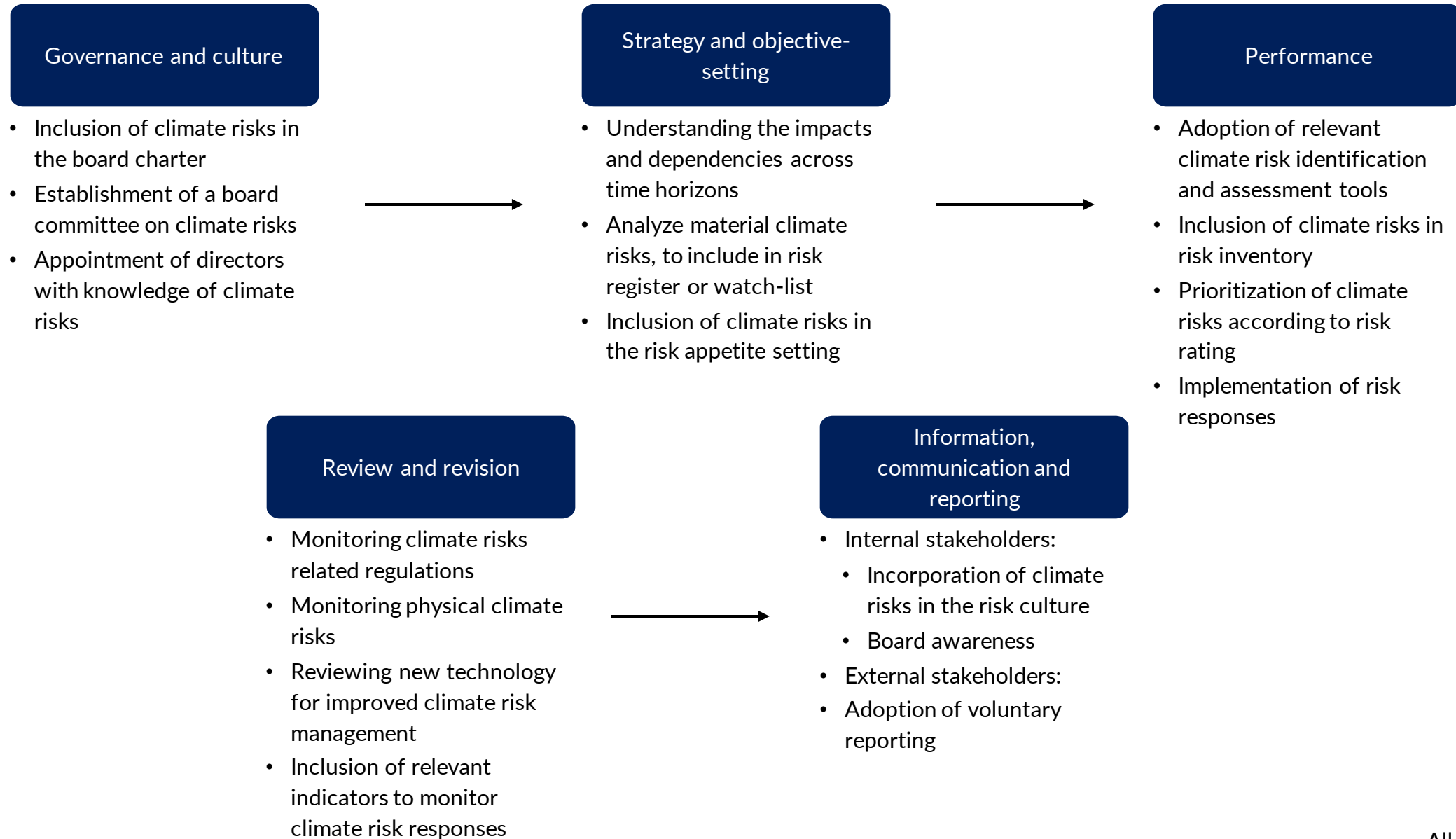
Risk Management: Typical structure of ERM frameworks

COSO's Enterprise Risk Management framework

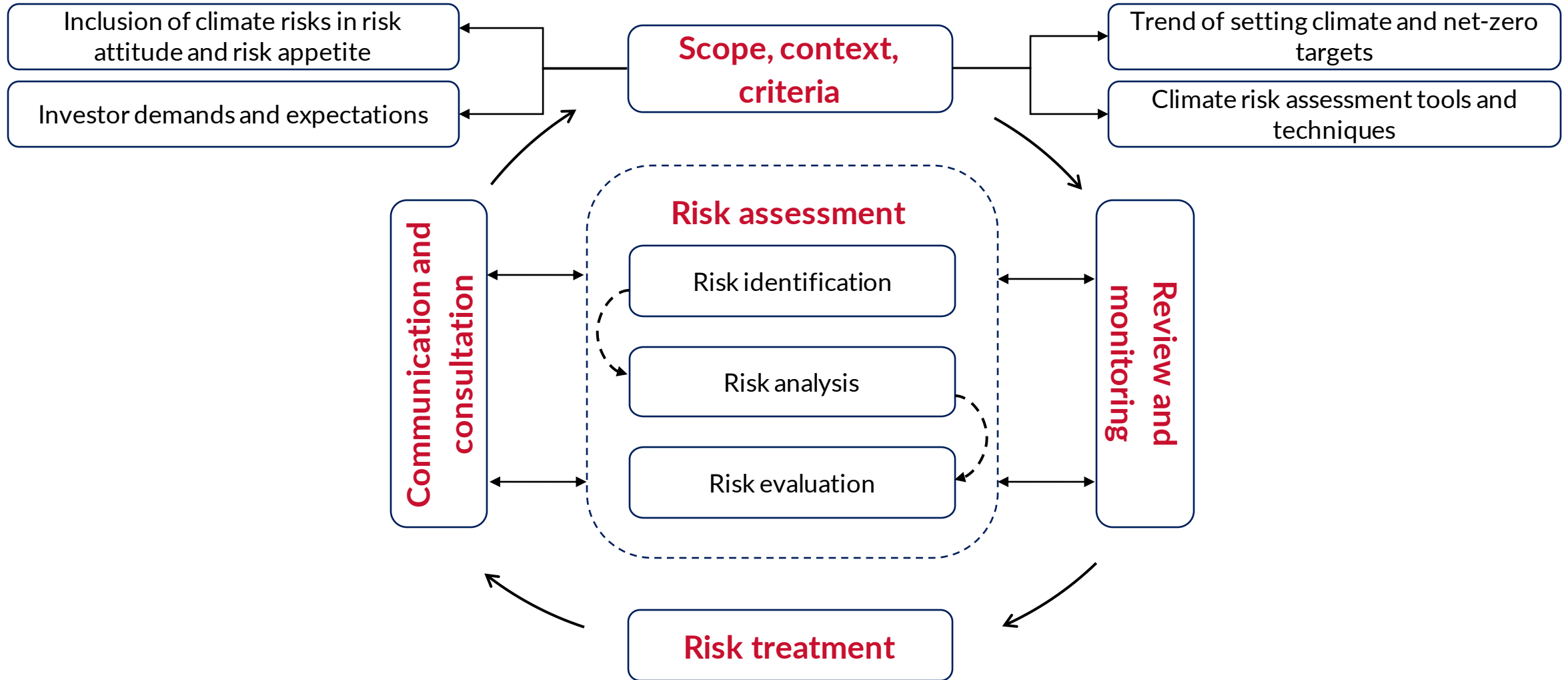


 GOVERNANCE & CULTURE	 STRATEGY & OBJECTIVE-SETTING	 PERFORMANCE	 REVIEW & REVISION	 INFORMATION, COMMUNICATION & REPORTING
<ol style="list-style-type: none"> 1. Exercises Board Risk Oversight 2. Establishes Operating Structures 3. Defines Desired Culture 4. Demonstrates Commitment to Core Values 5. Attracts, Develops and Retains Capable Individuals 	<ol style="list-style-type: none"> 6. Analyzes Business Context 7. Defines Risk Appetite 8. Evaluates Alternative Strategies 9. Formulates Business Objectives 	<ol style="list-style-type: none"> 10. Identifies Risk 11. Assesses Severity of Risk 12. Prioritizes Risks 13. Implements Risk Responses 14. Develops Portfolio View 	<ol style="list-style-type: none"> 15. Assesses Substantial Change 16. Reviews Risk and Performance 17. Pursues Improvement in Enterprise Risk Management 	<ol style="list-style-type: none"> 18. Leverages Information and Technology 19. Communicates Risk Information 20. Reports on Risk, Culture and Performance

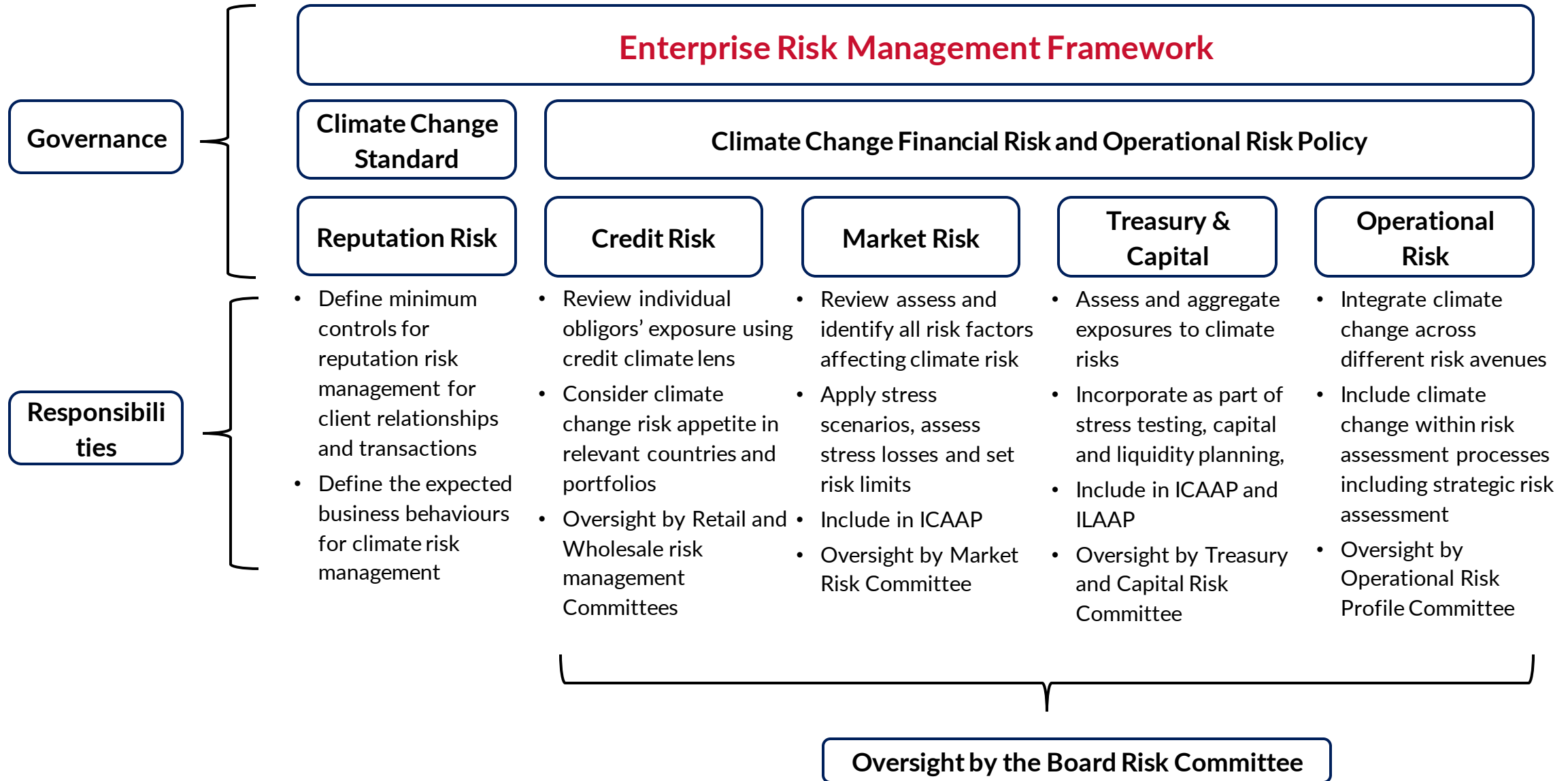
Integrating climate risks into ERM (1/2)



Integrating climate risks into ERM (2/2)

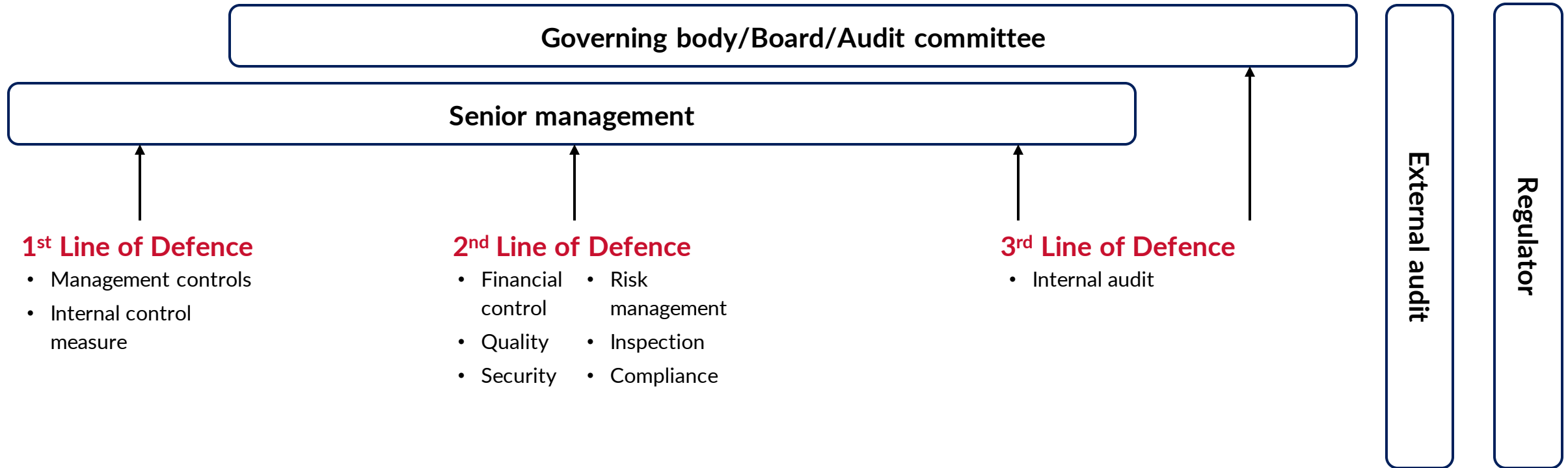


Risk management: ERM and risk governance



Three Lines of Defence and climate risk management

Three Lines of Defence model

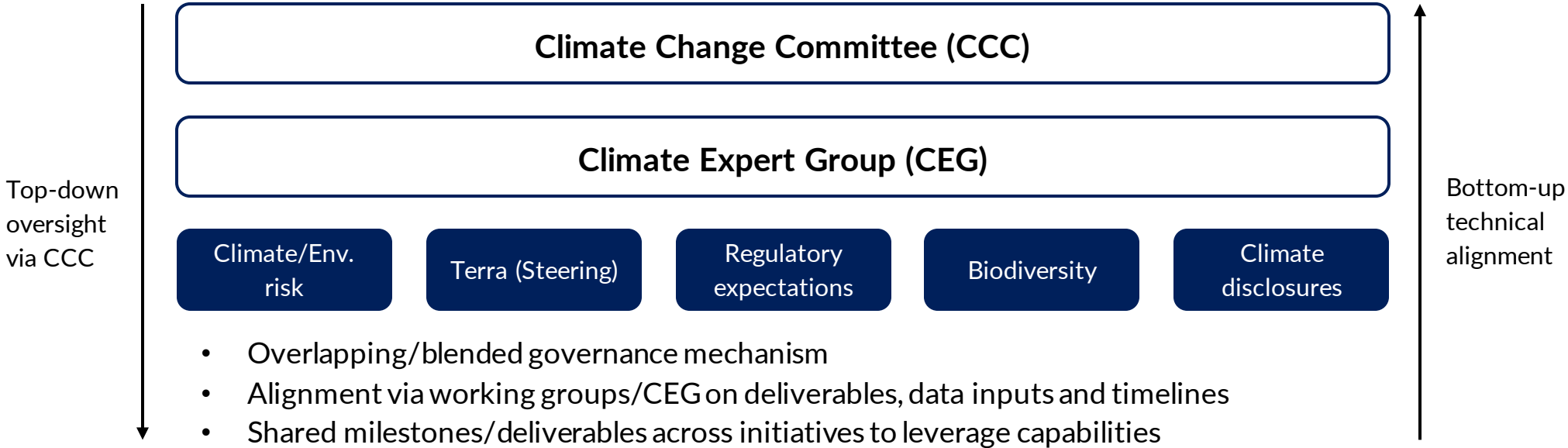


Additionality of climate risks



Case study: ING Bank

Climate governance structure



Leveraging capabilities



Identifying conflicts



Issuing corrective actions

Snapshot: Climate Action

5 of 9

sectors are on track with climate alignment pathways, another 3 are close to the pathway.

- on track** Power generation
- on track** Upstream oil & gas
- on track** Residential real estate
- on track** Automotive
- on track** Shipping
- close to on track** Commercial real estate
- close to on track** Cement
- close to on track** Steel
- not on track** Aviation

Renewables account for

64%

of our power generation financing at year-end 2020. This includes wind, solar, water and geothermal power.

Began using

100%

renewable electricity in our own buildings in 2020, and reduced carbon emissions by 75% since 2014.

Set new target to reduce our funding to upstream oil & gas by

12%

by 2025 from 2019, in line with the IEA net-zero 2050 scenario.

Lending to thermal coal mining has reduced more than

90%

to €30m in at year-end 2020 from €316m in 2017.

Climate risk heatmaps completed for over

83%

of assets in Wholesale Banking.

In 2020, ING closed

139

sustainable finance transactions, including supporting the largest ever sustainability-linked RCF for AB Inbev.

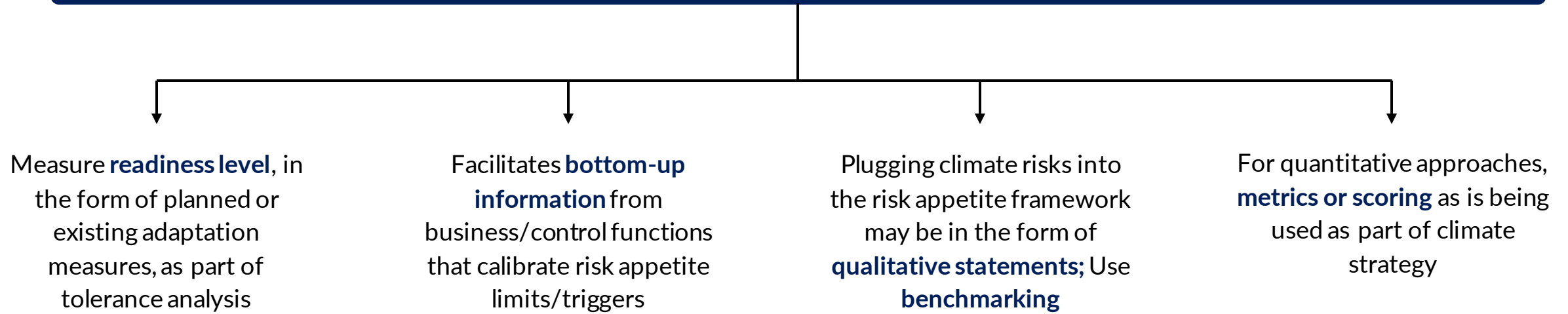
Our reporting scope for mortgages reached

70%

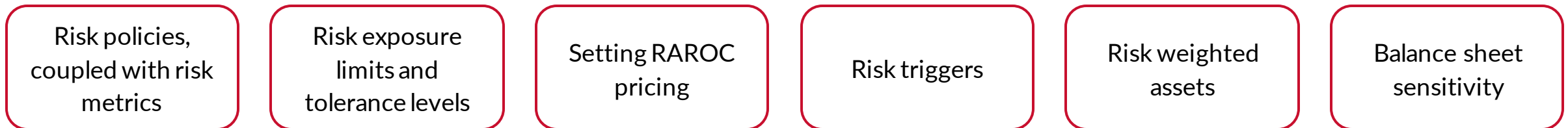
from 50% by including Poland and Belgium.

Risk management: risk appetite framework

Risk appetite frameworks show the collective impact of risk-taking and tolerance that needs to be managed across the FI



Aspects in the risk appetite framework that need additionality of climate risks



Risk principles:

- Overarching philosophy
- Based on science
- Contextual to nature/complexity of the business

Risk metrics:

- Based on acceptable level of climate volatility
- Emissions-specific metrics
- Reputation-specific metrics

Risk preferences:

- Qualitative statements for risk selection/minimization
- Avoidance thresholds
- Cuts across all conventional risk-types

Risk tolerances/limits:

- Rank ordering based on risk metrics/KRIs
- Drives the process of escalation/reporting
- Monitor potential breaches and contingency plans

Take home point 2

Managing climate risks effectively requires a process of identification, assessment and management, spanning all the critical functions within the bank. However, approaches to do so are still evolving, and banks are using those approaches that work best for their context

Break

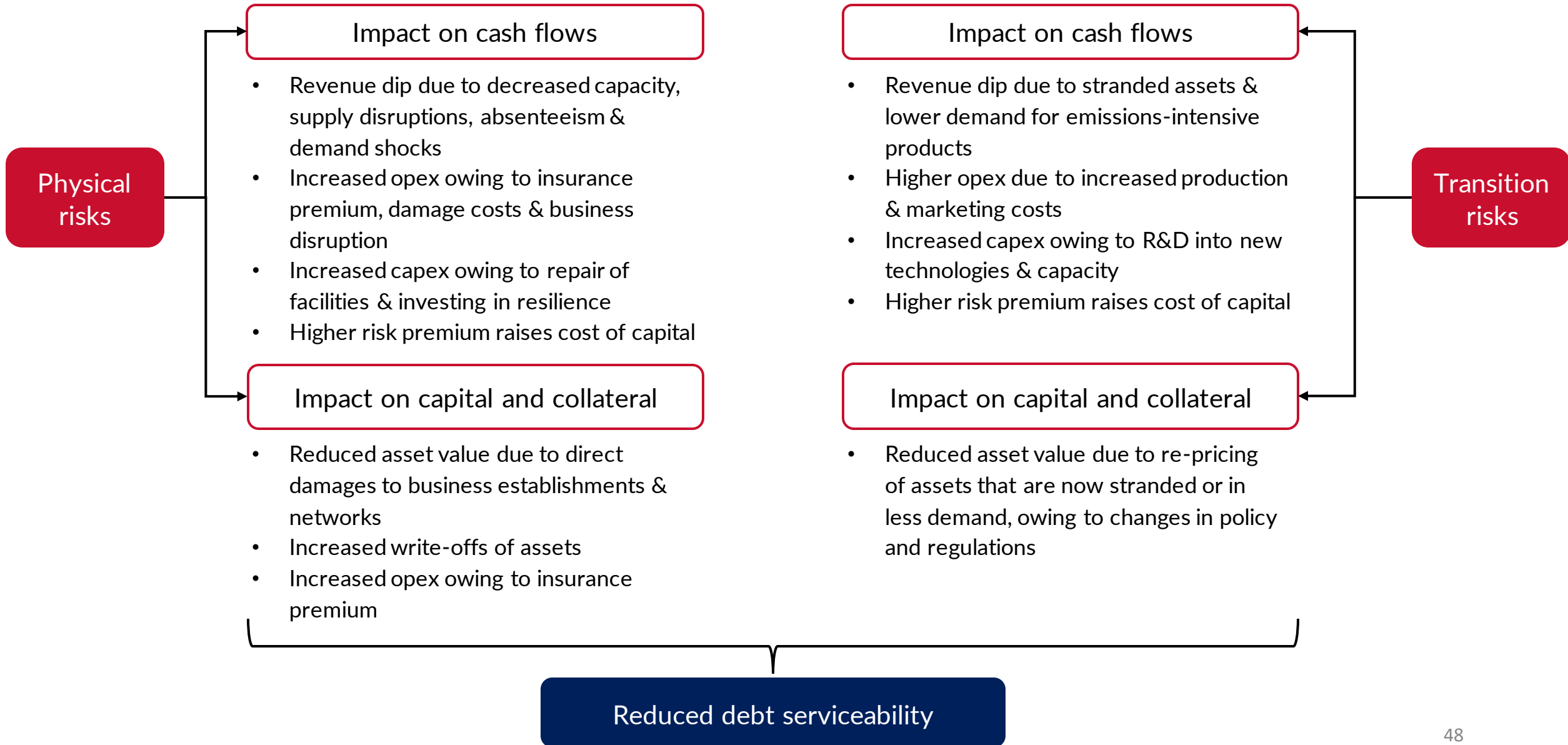
Climate risk and conventional financial risks

- *Credit risk*
- *Other risks (Market, Operational, Compliance, Liquidity, Reputation)*

Impact on conventional financial risks

Risk type	Potential impacts of climate risk
Financial risk	
Credit risk	Credit risk increases if climate risk drivers reduce borrowers' ability to repay and service debt (income effect) or banks' ability to fully recover the value of a loan in the event of default (wealth effect).
Market risk	Reduction in financial asset values, including the potential to trigger large, sudden and negative price adjustments where climate risk is not yet incorporated into prices. Climate risk could also lead to a breakdown in correlations between assets or a change in market liquidity for particular assets, undermining risk management assumptions.
Liquidity risk	Banks' access to stable sources of funding could be reduced as market conditions change. Climate risk drivers may cause banks' counterparties to draw down deposits and credit lines.
Non-financial risk	
Operational risk	Increasing legal and regulatory compliance risk associated with climate-sensitive investments and businesses.
Reputational risk	Increasing reputational risk to banks based on changing market or consumer sentiment.

Credit risk: physical & transition risks



Credit risk faces a growing threat from climate risks

“Credit risk increases if climate risk drivers reduce borrowers’ ability to repay and service debt (income effect) or banks’ ability to fully recover the value of a loan in the event of default (wealth effect)” *(Basel Committee on Banking Supervision, 2021)*

Oil majors' credit ratings under threat from growing climate risks

[\(S&P, 2021\)](#)

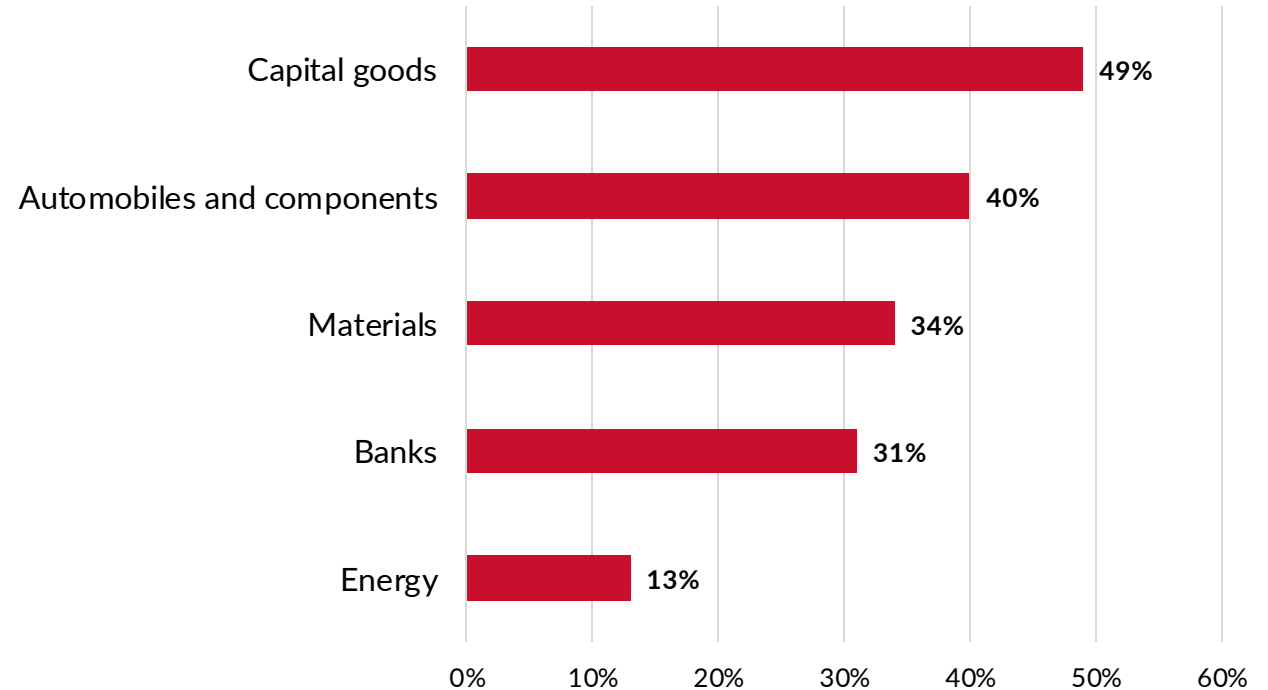
As Climate Risk Grows, So Will Costs for Small Businesses

[\(Harvard Business Review, 2022\)](#)

Rating stability at risk from looming climate downgrades

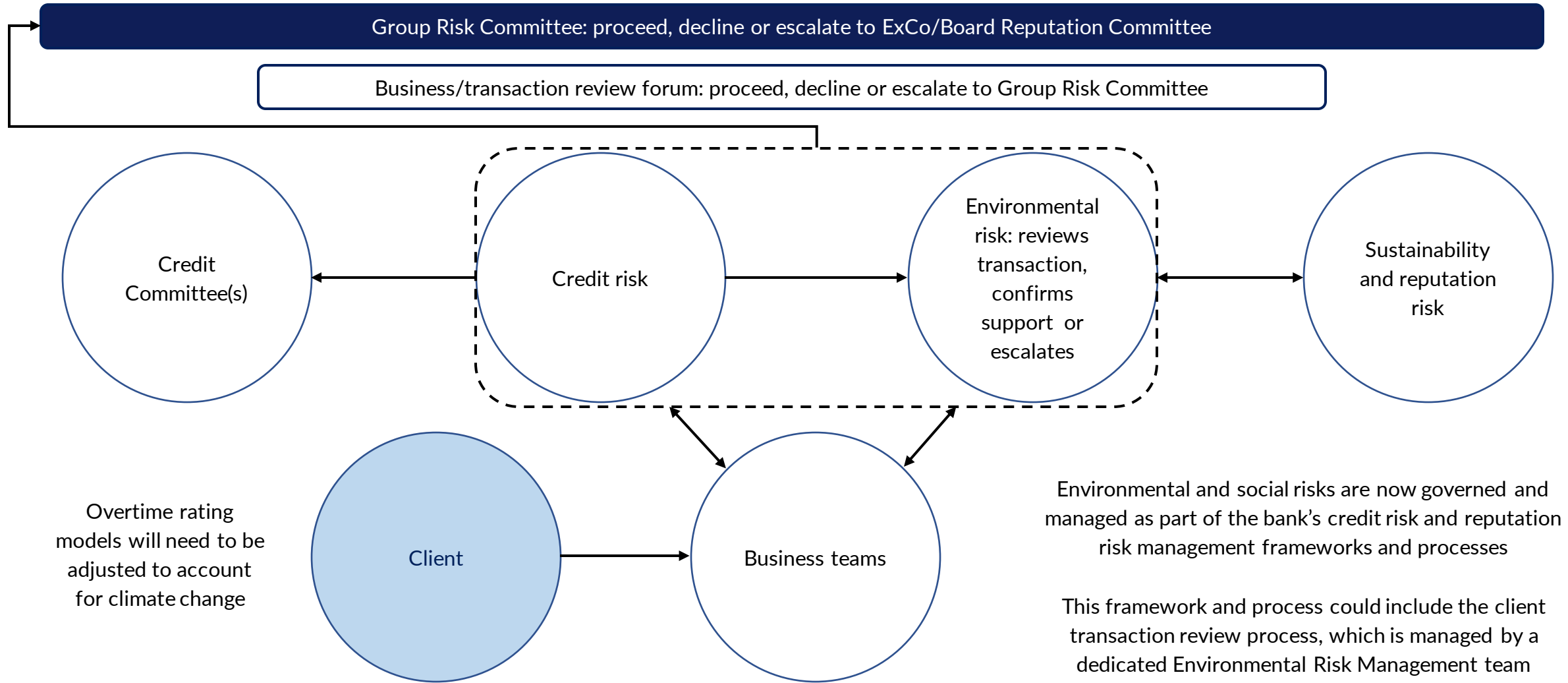
[\(IEEFA, 2023\)](#)

Credit score downgrade for S&P500 Index companies



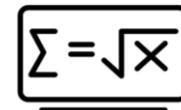
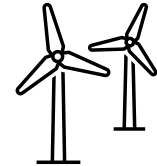
Typical credit risk management framework

Environmental and social risk assessment embedded in the transaction review process



Enhancing the CAM and due diligence processes

- 1 Require non-financial disclosures/information related to climate risk issues, as part of client KYC
- 2 Integrate climate risk (especially transition risk) in the E&S criteria towards new loan proposals
- 3 Integrate climate risk in financial analysis and the internal credit rating of a loan facility and borrower
- 4 Revise risk categorization systems to integrate climate risks, and estimate loss ratios



Climate risks in the existing loan book

Credit rating reviews



Follow-on tranches



Periodic reviews



Revolving facilities



Refinancing of facilities



Estimating credit risk/loss due to climate shock (1/2)

Refer to **Expected Loss formula**, used as standard practice in banking, to assess credit risk from a climate event

- EL is the product of POD%, LGD% and EAD

POD% is based on back-testing default data, for a rating level. In the absence of data on defaults due to climate events, assume Climate POD% based on **credit default data from E&S issues** as a proxy, since climate risk has a transverse impact on conventional financial risks like credit risk

- This approach may give some information into potential credit risks due to climate change, and the capital charge

Consider adding an **uncertainty variable** for stochastic nature

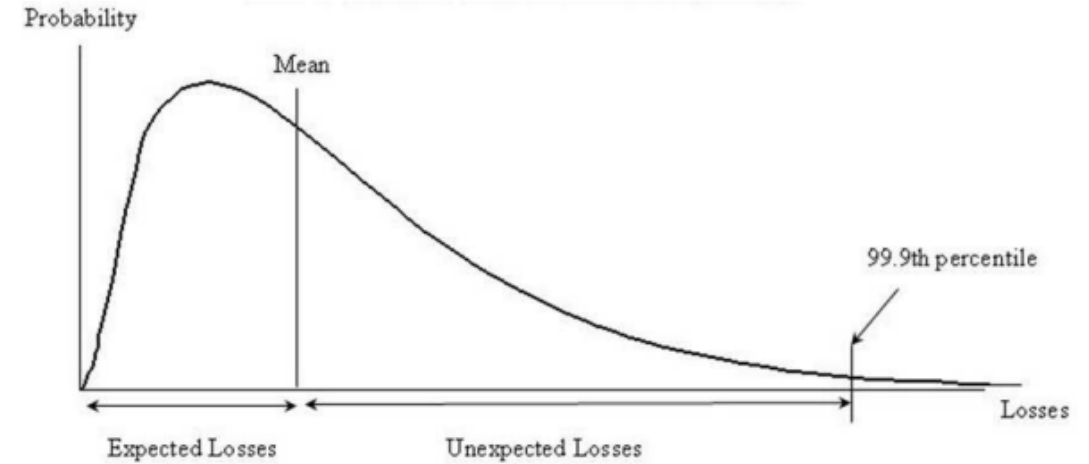


Figure 5.1: Distribution of credit losses.

To sum up, the expected loss is calculated as follows:

$$EL = PD \times LGD \times EAD = PD \times (1 - RR) \times EAD,$$

where :

PD = probability of default

LGD = loss given default

EAD = exposure at default

RR = recovery rate ($RR = 1 - LGD$).

Expected loss is covered by revenues (interest rate, fees) and by loan loss provisions (based on the level of expected impairment).

Estimating credit risk/loss due to climate shock (2/2)

Refer to **Merton Model** of credit risk modelling, to assess POD% of a counterparty

- This is based on the probability of its assets falling below debt

This involves estimating **present value of the counterparty's assets** – follows from the impact analysis approach

Estimate POD from the d_2 formula, under Merton model for credit risks

Equity can be viewed as a residual claim on assets after the debt has been repaid

The Formula for the Merton Model

$$E = V_t N(d_1) - K e^{-r\Delta T} N(d_2)$$

where:

$$d_1 = \frac{\ln \frac{V_t}{K} + \left(r + \frac{\sigma_v^2}{2}\right) \Delta T}{\sigma_v \sqrt{\Delta T}}$$

and

$$d_2 = d_1 - \sigma_v \sqrt{\Delta t}$$

E = Theoretical value of a company's equity

V_t = Value of the company's assets in period t

K = Value of the company's debt

t = Current time period

T = Future time period

r = Risk-free interest rate

N = Cumulative standard normal distribution

e = Exponential term (*i.e.* 2.7183...)

σ = Standard deviation of stock returns

Pricing climate risks in credit analysis

Approaches to quantify physical and transition risks for loan pricing.

<i>Based on Bernoulli's St. Petersburg Paradox</i>	High probability	Low probability
High impact		? (climate)
Low impact	? (insurance)	

Carbon-intensive exposure within Indian bank lending

Sectors with high emissions and/or debt intensity that are likely to face greater risk to a low carbon transition

Indian bank lending to carbon-intensive sectors (2021)	
Sector	Domestic Credit (Rs Crore)
Manufacturing (chemicals, metals, petroleum, etc.)	433,484
Mining (oil, gas, coal, metals, non-metals)	109,611
Non-durables (chemicals & petroleum)	500
Transportation, communications, electric, gas and sanitary services	712,471
Total of carbon-intensive sectors	1,256,065
Total for India	10,860,425

- 12% of INR lending
- 60% of GHG emissions
- Stranded asset percentage

Case study: Taipei Fubon Bank

		Carbon Fee Stress Test Scenarios			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
		NT\$100	NT\$980 (About \$32.70)	NT\$2,200 (About €67)	NT\$3,420 (About \$114)
Scenario Description		Taiwan's Environmental Protection Administration is planning to amend the Greenhouse Gas Reduction and Management Act and change its name to the "Climate Change Adaptation Act," and it has been listed as a priority bill in the Legislature. It is expected to launch a phased-in introduction of carbon fees from 2024, starting with manufacturers that directly generate more than 25,000 metric tons of GHG (287 companies). The scenario uses the most frequently discussed carbon fee in conjunction with the bill of NT\$100 per metric ton.	Based on the first part of the IPCC's Sixth Assessment Report, only an SSP1 scenario can avoid warming above 2°C by the end of the century. Under the SSP1-2.6 scenario (low emissions), the global carbon fee will be US\$32.70 per metric ton by 2030.	The EU has drafted a Carbon Border Adjustment Mechanism (CBAM) that is expected to launch carbon inventory checks in 2023 and require companies to buy carbon credits to cover the carbon content of goods they import starting in 2026. The purchase price of CBAM certificates will be set based on the average closing price of weekly EU Emission Trading Scheme carbon credit auctions. This scenario uses the EU carbon market's key price of 67 euros per metric ton.	Selected the orderly transition Net Zero 2050 scenario from among the NGFS' six major scenarios; this scenario uses the estimate for China's carbon price in 2025 of US\$114 per metric ton.
Changes in internal credit ratings	-3	0 client	1 client	1 client	2 clients
	-2	0 client	2 clients	2 clients	7 clients
	-1	0 client	5 clients	10 clients	13 clients
Increase in ECL		+0%	+200.19%	+202.65%	+210.53%
Average EL change (bps)		+0	+57	+57	+60
Increase in ECL (Excluding main power operator client)		+0%	+9.38%	+18.07%	+45.89%
Average EL change (bps) (excluding a main power operator client)		+0	+1	+2	+5

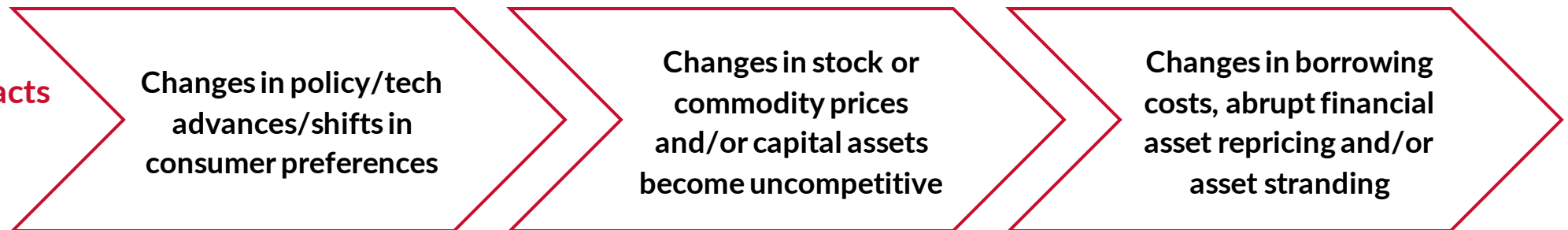
Other risks: market risk

“Reduction in financial asset values, including the potential to trigger large, sudden and negative price adjustments where climate risk is not yet incorporated into prices. Climate risk could also lead to a breakdown in correlations between assets or a change in market liquidity for particular assets, undermining risk management assumptions” *(Basel Committee on Banking Supervision, 2021)*

Physical risk impacts



Transition risk impacts



Other risks: operational risk

Strengthening Business Continuity and contingency planning (BCP)

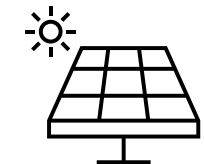


Assess branch and office locations' risk exposure to physical risks of climate change

Operational risk identification and root cause analysis of potential impacts



Technology risk as operational risk



High energy costs of IT data servers of banks on the back of carbon pricing

Basel Pillars

Pillar 1: Mandatory capital requirements for credit, market and operational risks, as a percentage of RWA

Pillar 2: ICAAP/Supervisory review; banks to assess capital adequacy for all potential risks

Pillar 3: Market discipline through periodic disclosures

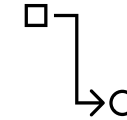
Debates

- Minimal climate risks is covered, especially transition risk
- Climate, or at least transition risk, as a material risk impacting credit, market and operations (Pillar 1)
- Else, climate as an additional probable risk that needs safeguarding (Pillar 2)
- Capital for safeguard vs. capital for assets
- “Shades of green” approach to green assets, to appropriate weightage as part of RWA

Other risks: liquidity risk

“Banks’ access to stable sources of funding could be reduced as market conditions change. Climate risk drivers may cause banks’ counterparties to draw down deposits and credit lines.” [\(Basel Committee on Banking Supervision, 2021\)](#)

Climate risk impact and ALM/maturity mismatches



Impact on cost of funds and funds’ availability, due to climate risk issues



Considering climate risks before re-deploying principal repaid



Access to dedicated green capital and the impact on cost of funding



Other risks: compliance risk

“Increasing legal and regulatory compliance risk associated with climate-sensitive investments and businesses.” *(Basel Committee on Banking Supervision, 2021)*

Non-adherence to climate-related regulations may lead to litigation payments, fines, legal and administrative costs

Examples

Action against a large British pension fund’s fossil fuel investments

Action against an Australian pension fund’s failure to provide adequate information about its climate risks exposures and its plans to address the same

Action against a company’s board of directors and senior management, that makes misleading claims about the biodegradability of the plastic it produces, and its GHG emissions

Action to compel a university to divest its endowments investments from fossil fuel companies

Global suits against corporations



Other risks: reputation risk

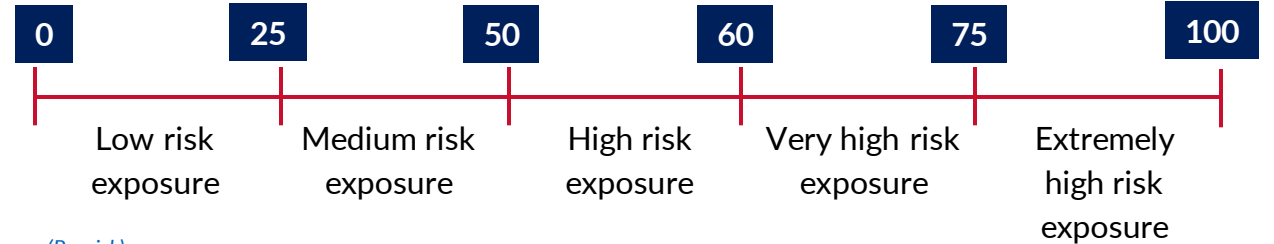
Europe's five biggest banks face \$1trn investor anger for fossil fuel financing

[\(ESG Clarity, 2023\)](#)

Youth won't be fooled: Report exposes reputational risk for banks targeting youth through sponsorship while funding fossil fuels

[\(Greenpeace, 2022\)](#)

Reputation score for funding carbon-intensive sectors



[\(Reprisk\)](#)

Aspects to consider for developing reputation score

Impact on customer retention, new client acquisition and revenue

Impact on marketing costs to save reputation vs. cost of transition

Credibility of transition plans and portfolio divestment targets

Climate-related disclosures

Branding issues due to reputational risk



Extinction Rebellion-led protests outside bank branch in Brighton, UK



Climate activists protest against US banks financing of the fossil fuels industry outside a bank in San Francisco, USA

[\(Guardian, 2023\)](#)



Activists protest outside US headquartered bank, ahead of their annual shareholder meeting in New York, USA

[\(Guardian, 2023\)](#)



A spray-painted message left by climate protestors on the outside of a US bank branch in New York, USA

[\(Reuters, 2023\)](#)

Climate disclosures: TCFD's recommendations

Governance	Strategy	Risk Management	Metrics and Targets
<p>Disclose the organization's governance around climate-related risks and opportunities.</p>	<p>Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.</p>	<p>Disclose how the organization identifies, assesses, and manages climate-related risks.</p>	<p>Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.</p>
<p>Recommended Disclosures</p>	<p>Recommended Disclosures</p>	<p>Recommended Disclosures</p>	<p>Recommended Disclosures</p>
<p>a) Describe the board's oversight of climate-related risks and opportunities.</p>	<p>a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.</p>	<p>a) Describe the organization's processes for identifying and assessing climate-related risks.</p>	<p>a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.</p>
<p>b) Describe management's role in assessing and managing climate-related risks and opportunities.</p>	<p>b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.</p>	<p>b) Describe the organization's processes for managing climate-related risks.</p>	<p>b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.</p>
	<p>c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</p>	<p>c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.</p>	<p>c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.</p>

Take home point 3

Given its transverse nature, climate risks may accelerate conventional financial risks within banks. Basel also informs that climate risks have the potential to transmit to conventional risks. To minimize the negative impact on credit rating, asset valuation, liquidity position, business continuity, compliance and reputation, banks need to start assessing the potential impact of climate risk events

Gender equity and social inclusion (GESI)

- *Risks*
- *Opportunities*

Gender equity and social inclusion (GESI)

Climate change may push up to 158.3 million more women, girls into poverty: SDGs Progress Report

[\(Hindustan Times, 2023\)](#)

India's rural migrants face climate hazards in the cities

[\(Ecobusiness, 2021\)](#)

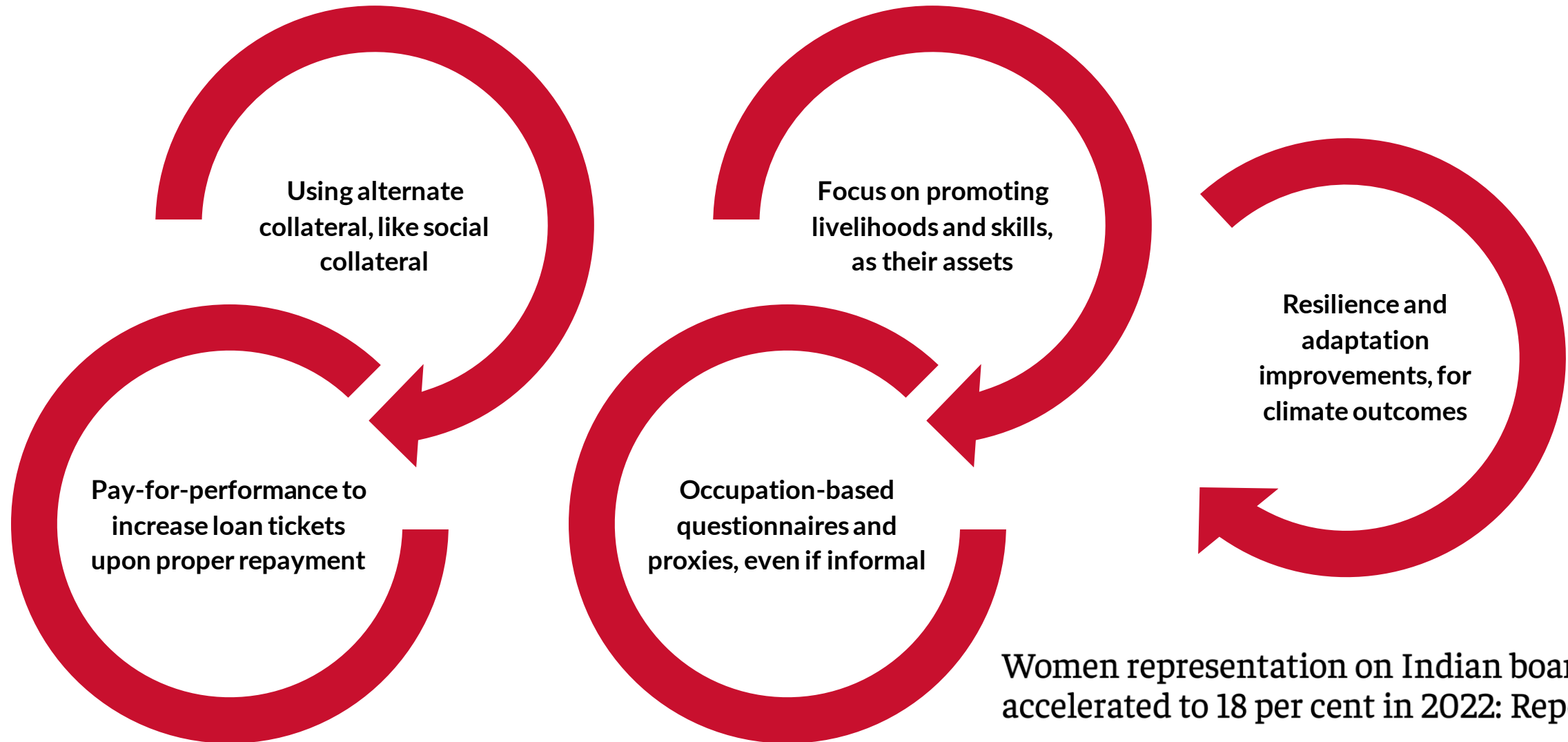


[\(Fortune, 2015\)](#)

Impoverished communities pay for worsening impacts of climate change: Experts

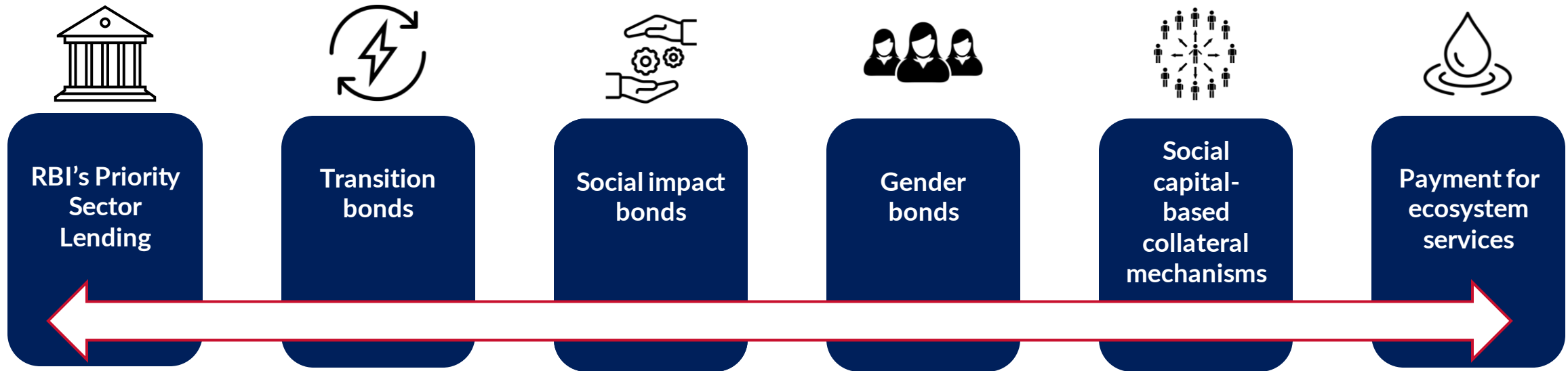
[\(ABC News, 2021\)](#)

Managing risks related to financing GESI-interventions

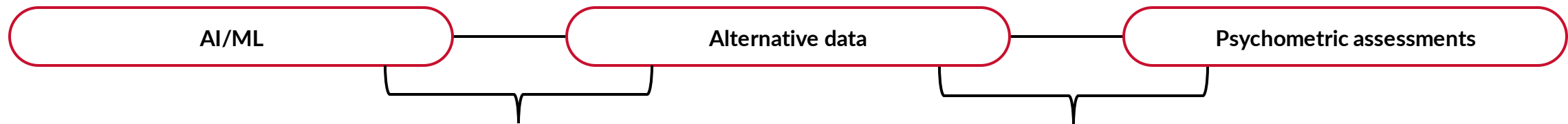


Managing opportunities offered by GESI-interventions

Leveraging GESI strategies to innovate banking products



Alternative credit methodologies for financial inclusion



Alternative data can help improve credit analysis and produce a more nuanced picture of creditworthiness

Non-financial information can determine credit worthiness, boost the predictive power of regular data and mitigate risk associated with human bias

Take home point 4

Pursuing GESI-oriented strategies from a risk and opportunity standpoint, holds a strong business rationale by opening up new segments while institutionalizing required risk processes

Conclusion & way forward

- *Summary and action-points*
- *Setting the stage for Day 2*

Conclusion and way forward

- 1 Understanding of material climate issues
- 2 Actioning appropriate climate risk assessment processes
- 3 Manage the climate risks across all banking risks and functions



Engage clients for portfolio alignment towards low-carbon – Day 2

Q&A with participants

End of Day 1



Enhancing climate transition planning in the Indian financial sector

2023-24

Skill enhancement program for frontrunning Indian banks

Net zero transition and decarbonization planning within banks

- 1 Context setting
- 2 Transition planning process, including financed emissions and sectoral pathways
- 3 Transition finance strategies and products
- 4 Reporting transition plans and engagement with stakeholders

Context setting

- *Previous day recap and double materiality*
- *Introduction to net-zero transition and decarbonization*
- *Global developments in net-zero transition planning*
- *Concepts of net zero transition planning*

Interrelationship between climate risks and decarbonization

Financial Materiality

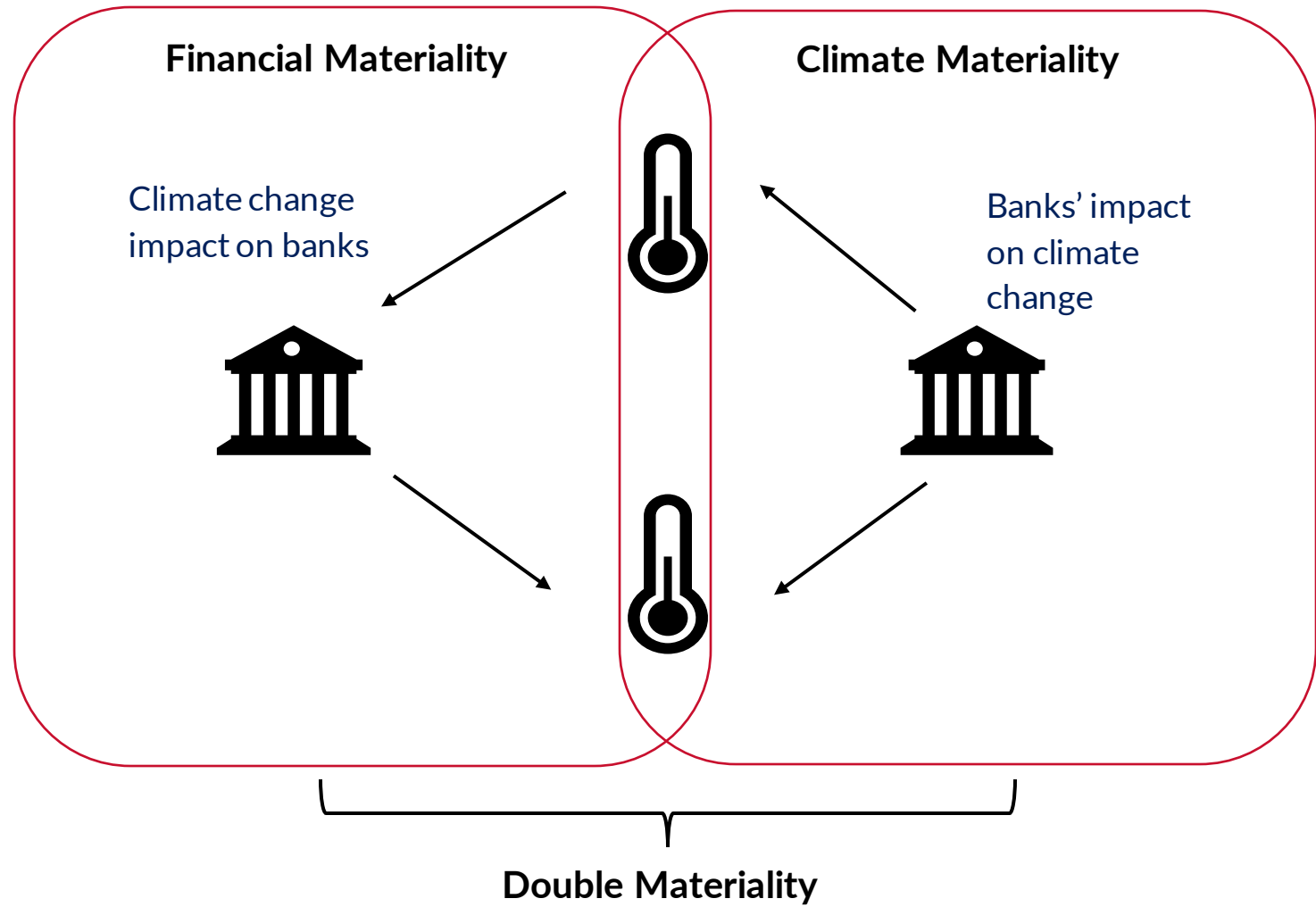
Impact of climate related risks on the financial performance of a bank across various time horizons

Climate Materiality

A bank's significant impact on climate through its lending and investment functions

Double Materiality

Impact of climate-related risks on a bank's financials, while simultaneously, also the impact of a bank on climate



Net zero Transition

- A commitment to net-zero means **reducing** GHG emissions with the goal of balancing the emissions produced and emissions removed from the earth's atmosphere

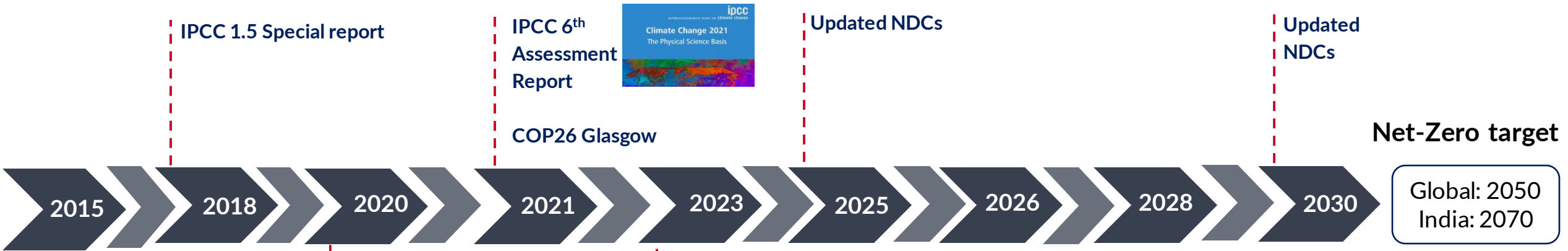
Decarbonization

- Process of **reducing** GHG emissions across industries
- A **process** on the path of attaining net zero target

Carbon Neutral

- Balancing GHG emissions by '**offsetting**' or removing from the atmosphere, an equivalent amount of carbon for the amount produced
- A commitment to carbon neutrality **does not require** (or even necessarily imply) a commitment to reduce overall GHG emissions

Evolution and status of net zero transition goals



Paris Agreement adopted and commitment (COP21)

Initial submission of NDCs



Updated NDCs

National long-term strategies



First Global Stocktake of NDCs

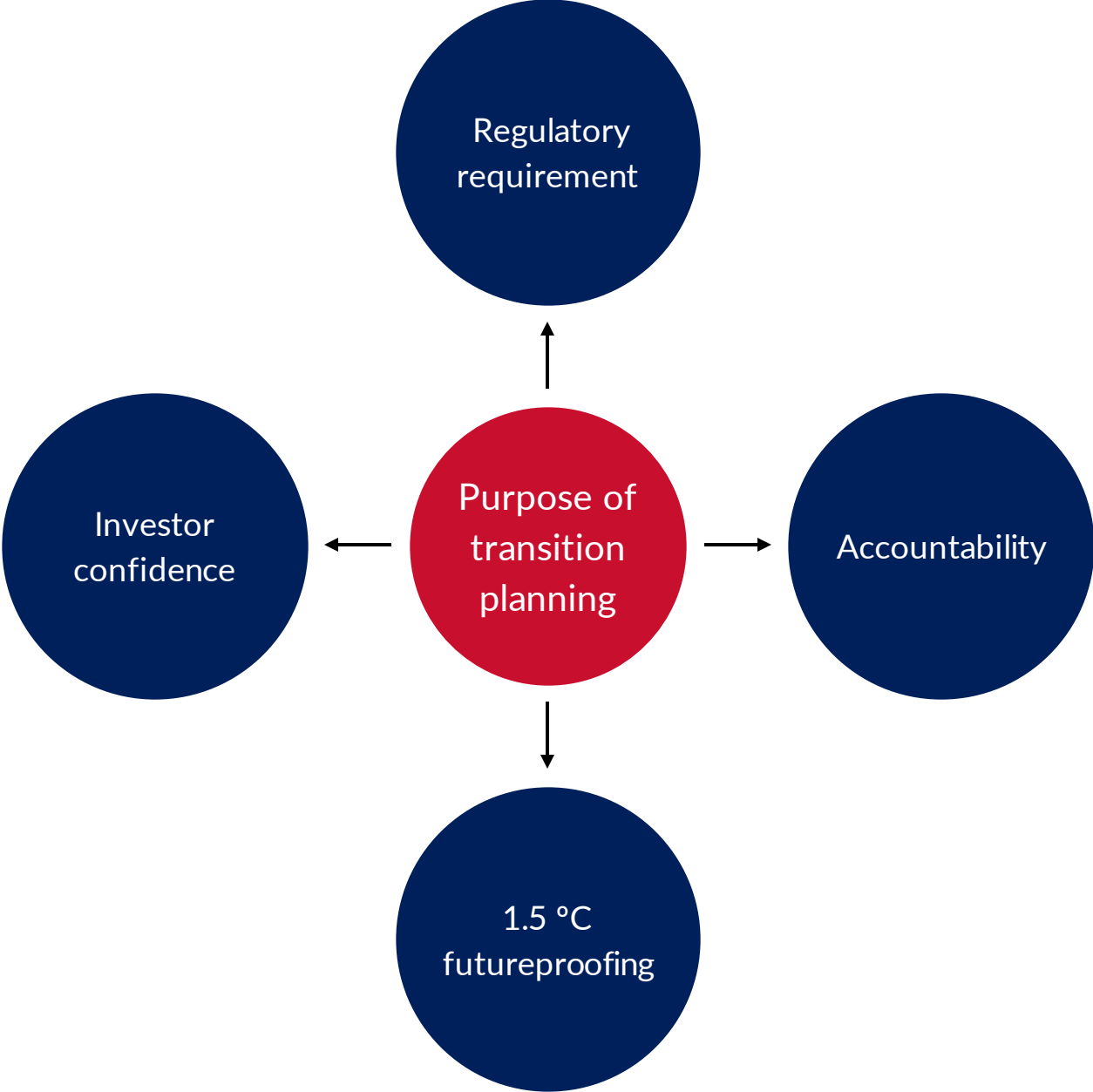
Global Stocktake

Net-Zero target
Global: 2050
India: 2070

India latest NDCs

- Reduce emissions intensity by 45% from 2005 levels by the year 2030
- Achieve 50% cumulative electric power (installed capacity) from non-fossil energy by 2030
- Additional carbon sink of 2.5-3 billion tonnes of CO₂e (additional forest and tree cover)

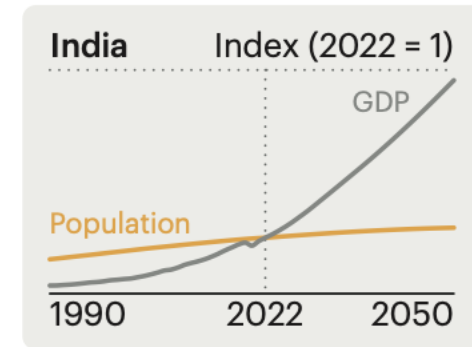
Need for net-zero transition planning by banks



Balancing India's NDCs and economic growth



Economic and population drivers



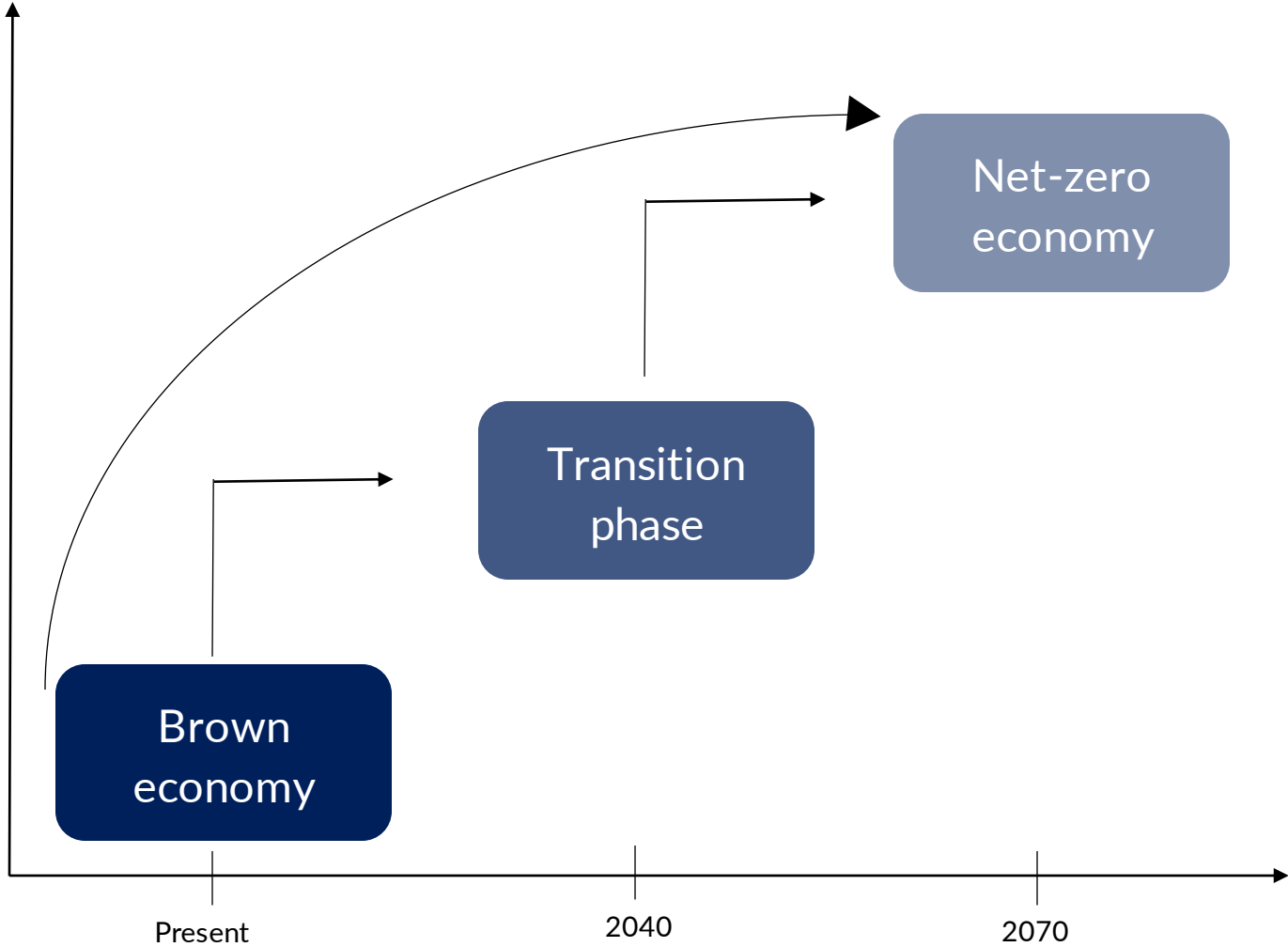
- Updated NDCs
- Net Zero Emissions Bill, 2022
- Long-Term Low Emissions and Development Strategy (LT-LEDS)
- The Energy Conservation Bill (Amendment) Bill, 2022

- India aims to become an advanced nation by 2047
- GDP at an average of +6.5% annually for the next five years (IMF)

Global developments in transition planning



Pathway to net-zero transition



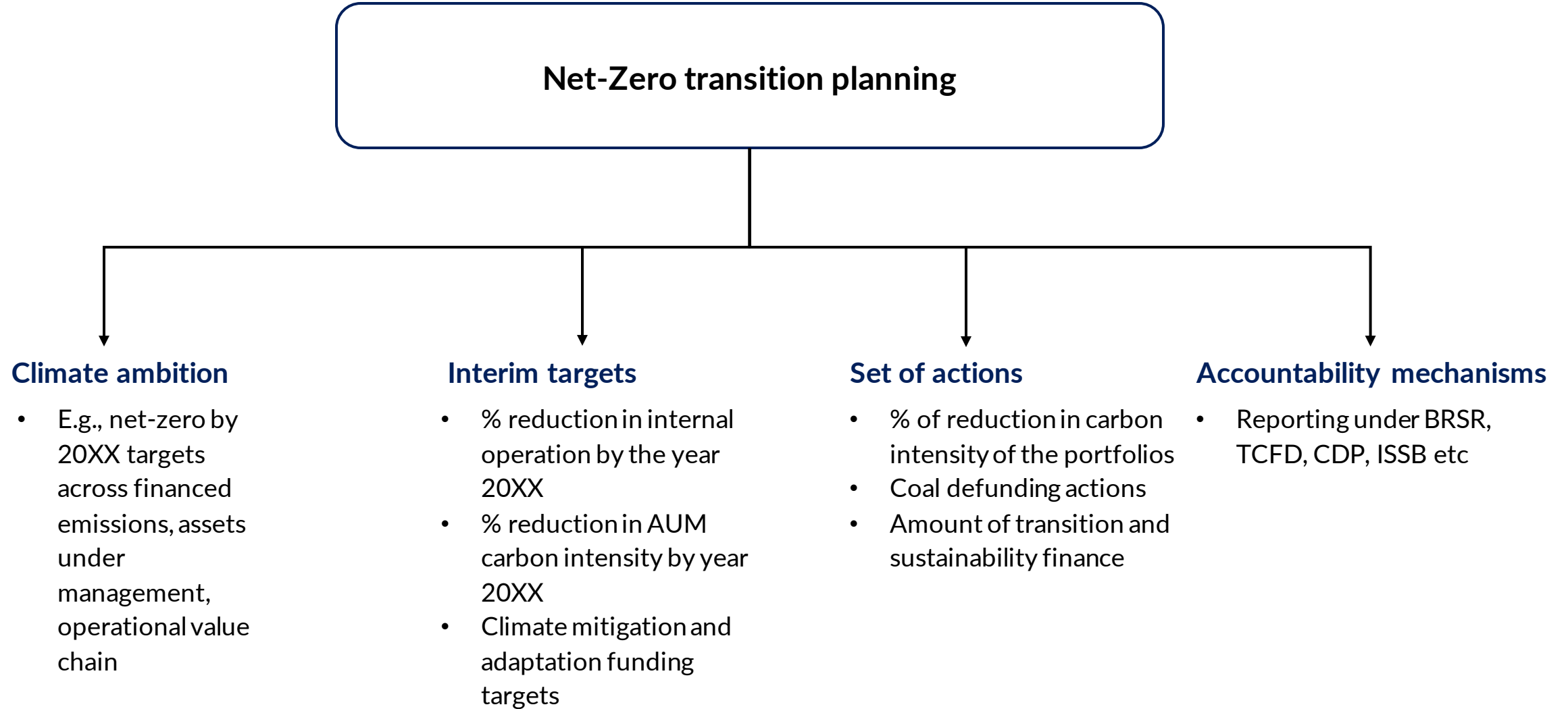
Frontloading decarbonization

Frontloading is **rapid reduction in carbon emissions** with available technologies **in the near-term**. For banks, this is front loading of finance to support decarbonization activities in an economy

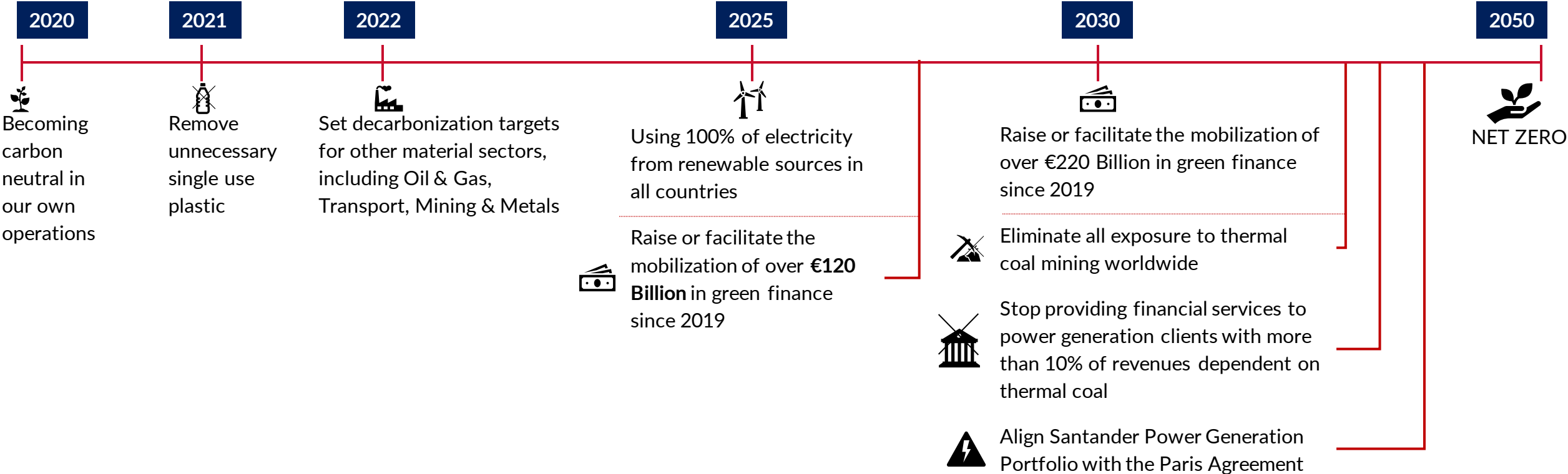
Just transition

Just Transition refers to a fair and equitable process of shifting to a low-carbon economy while ensuring that the **burdens and benefits are distributed fairly** among all stakeholders, including workers and marginalized communities

Elements in net-zero transition planning



Case study: Santander Bank, UK



Take home point 1

Global and national developments towards net-zero transition planning and target setting creates a sense of urgency for banks to set their own transition targets. While there has been disjointed measures towards decarbonization by banks, going forward, a comprehensive and science-based target setting, and implementation strategy is the next immediate step by banks towards creating a net-zero economy

Net-zero transition planning process

- *Financed Emissions*
- *Implementation Strategy*
- *Role of Governance*
- *Sectoral Pathways*
- *Transition Finance – an opportunity*
- *Reporting Transition Plan*
- *Engagement Strategy with Stakeholders*

Financed Emissions (FEs)

- *Significance*
- *Methodology*
- *Challenges*

Financed emissions: what and why

Carbon emissions that are generated in the real economy due to lending activities by banks

Reasons for measurement

Transition planning



Target setting

Regulatory mandates



Reporting requirements

Investor confidence



GHG emissions: overview of scope 1, 2, and 3 emissions

Scope 1 (Operational)

Direct emissions from owned or controlled sources



On-site generator



Company Vehicles

Scope 2 (Operational)

Indirect emissions: Control over consumption, but no control over generation



Purchase electricity, steam, heating & cooling for own use

Scope 3

All indirect emissions in the value chain


Upstream Activities



Purchased goods & Services



Capital Goods



Fuel & energy related



Waste from operations



Business Travel



Employee Commute



Transportation & Distribution



Leased assets

Downstream Activities



Transportation & Distribution



Franchises



Leased assets



End-of-life treatment of sold products



Use of sold products



Processing of sold products

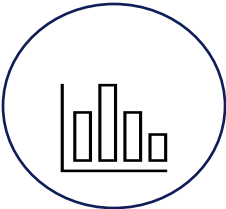


Investments

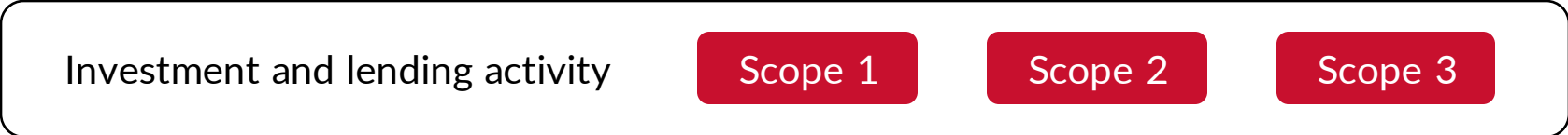
Scope 3 categories

Operational – Categories 1 to 14

Financed emissions – Category 15

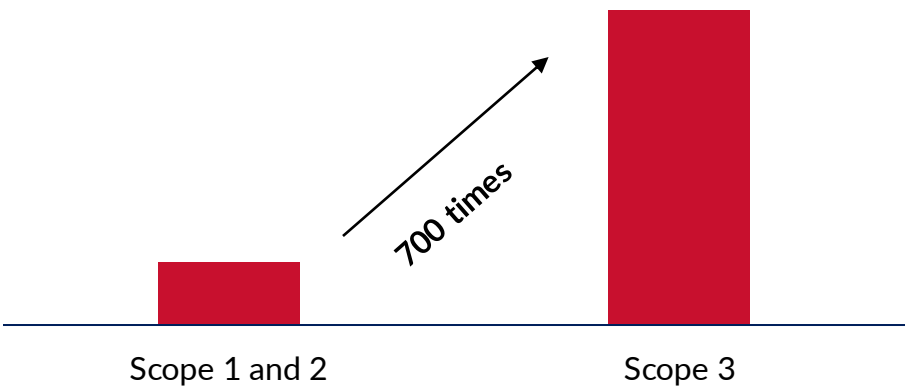


Investments



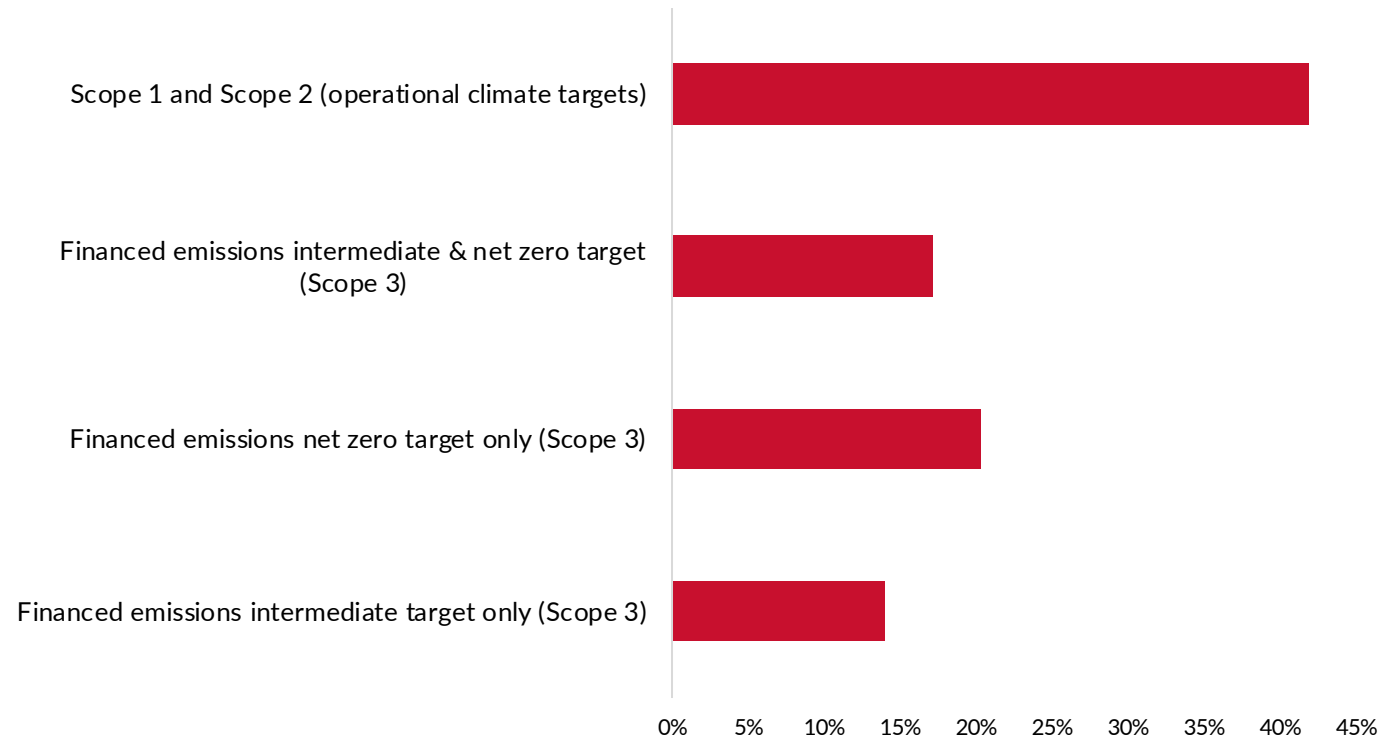
Share of scope 3, category 15 – investments

Operational (scope 1 and 2) v/s scope 3 emissions for banks



Financed emissions and financing the reduction of emissions

Few FIs have fixed targets to phase out financed emissions



Partnership for Carbon Accounting Financials (PCAF)

A global industry-led initiative to standardize the measurement and disclosure of financed emissions

2015: Netherlands



2018: North America



2019: Global



Objectives of PCAF:

Develop the global GHG accounting & reporting standard for the financial industry

Increase the number of FIs that use the standard & disclose financed emissions

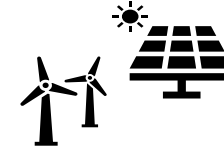
Financed emissions calculation across asset classes



Listed equity and corporate bonds



Business loans and unlisted equity



Project finance



Commercial real estate



Mortgages



Motor vehicle loans



Sovereign loan

Formula to calculate financed emissions

Financed emissions

=

$$\sum_i \text{Attribution factor}_i \times \text{Emissions}_i$$

(with i = borrower or investee)

Attribution factor

Types of emissions

Outstanding amount extended

Total Equity + Debt
(EV of listed companies, or book values for unlisted companies, or project capital for project financing)

- Based on energy activity, calorific value and emissions factor
- **Absolute emissions:** Total emissions of an asset class/portfolio (CO₂e)
- **Physical emissions intensity:** Emissions released per unit of physical activity (tCO₂e/tonne)
- **Economic emissions intensity:** Emissions released per unit of loan or investment volume (tCO₂e/\$M)

Example: an application of the formula

Data inputs across portfolio of companies

	Emissions in CO2e**			Attribution Factor	Financed emissions CO2-e
	Scope 1	Scope 2	Scope3		
Agriculture Company *	1,000	100	5,000	10%	610
Industrial Company	20,000	5,000	30,000	25%	13750
Energy Company	5,000	0	10,000	20%	3000

Equation:

Financed emissions CO2e = (Scope 1 * Attribution factor) + (Scope 2 * Attribution factor) + (Scope 3 * Attribution factor)

Sample calculation:

*Agriculture company = (1000*10%) + (100*10%) + (5000*10%) = 610

If emissions data is in terms of intensity:

** Multiply by an emissions factor

Considerations for financed emissions by HSBC

Emission Scopes considered in value chain

Sector	Value chain in scope				
Oil and gas	Upstream (e.g., extraction)	Midstream (e.g., transport)	Downstream (e.g., fuel use)	Integrated/diversified	Included in analysis
Power and utilities	Upstream (e.g., generation)	Midstream (e.g., transmission and distribution)		Downstream (e.g., retail)	

Sector Classification

Sector	NACE codes and definitions used for wholesale lending and project finance portfolio
Oil and gas	61 - Extraction of crude petroleum
	62 - Extraction of natural gas
	352 - Manufacture of gas; distribution of gaseous fuels through mains
Power and utilities	351 - Electric power generation, transmission and distribution

GHG coverage

- For oil and gas sectors, CO2 and methane (CH4), measured in CO2e are included
- For power sector, only CO2 (due to data availability) was included
- Avoided emissions not included in calculations (e.g. energy saving technologies)

Exclusion list

- Financial products with less than 12 months duration
- Product types: overdrafts, limited recourse receivables finance, and trade finance products (import, export bills)
- Corporate activities which are not lending products, such as savings and checking accounts

Carbon emissions data sources and data quality



Certain
(5-10% error margin in estimations)



Uncertain
(40-50% error margin in estimations)

Data quality scoring from 1 to 5...

Score 1	Audited GHG emissions data or actual primary energy data
Score 2	Non-audited GHG emissions data, or other primary data
Score 3	Averaged data that is peer/(sub)-sector specific
Score 4	Proxy data on the basis of region or country
Score 5	Estimated data with very limited support

An example: Maybank, Malaysia

The financed emissions are measured based on emissions attributable to the Group's lending and investment portfolios for the following asset classes and selected economic sectors analysed as of 31 December 2022:

Financed emissions by asset class								
Asset class	2021				2022			
	Total lending and Investment (RM'mil)	Financed Emissions (tCO ₂ e)	Emission Intensity (tCO ₂ e / RM'mil)	PCAF Data Quality Score	Total lending and Investment (RM'mil)	Financed Emissions (tCO ₂ e)	Emission Intensity (tCO ₂ e / RM'mil)	PCAF Data Quality Score
Listed equity and bond	71,935	7,376,014	102.5	4.1	74,207	5,949,004	80.2	4.9
Business loans and unlisted equity	235,823	11,031,113	46.8	5.0	254,700	13,860,307	54.4	5.0
Project finance	7,730	1,993,533	257.9	4.3	7,809	998,419	127.9	4.3
Commercial real estate	18,687	522,506	28.0	4.5	2,413	24,803	10.3	4.2
Mortgages	147,203	1,047,984	7.1	4.5	168,081	1,199,146	7.1	4.5
Motor vehicle loans	69,366	3,680,509	53.1	4.5	75,996	3,729,869	49.1	4.9
TOTAL	550,744	25,651,659	46.6		583,206	25,761,548	44.2	

Financed emissions by selected economic sector						
Economic sector	2021			2022		
	Total lending and Investment (RM'mil)	Financed Emissions (tCO ₂ e)	Emission Intensity (tCO ₂ e / RM'mil)	Total lending and Investment (RM'mil)	Financed Emissions (tCO ₂ e)	Emission Intensity (tCO ₂ e / RM'mil)
Power & Utilities	18,657	9,186,223	492.4	18,933	8,933,912	471.9
Agriculture (including Palm Oil)	16,459	3,777,687	229.5	23,451	3,515,342	149.9
Oil & Gas	13,100	3,708,627	283.1	14,480	4,789,814	330.8
Real Estate & Construction	64,503	777,982	12.1	72,692	314,896	4.3
TOTAL	112,719	17,450,519	154.8	129,556	17,553,964	135.5

Assets held for short durations and/or designated as held for sale are not included in the calculation. The Standard provides multiple approaches for GHG accounting across all six asset classes.

Challenges

Double counting

Coordination and communication with other FIs, usage of correct attribution rules, separately reporting scope 1, 2, 3 emissions



Data quality/accuracy

Collaboration with counterparties, investment in data analytics tools, and third-party data providers



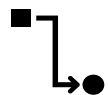
Standardization

Work with industry associations and regulatory bodies to develop common methodologies



Dependence on counterparty

Collaborative efforts and provision of incentives to improve emissions data reporting



Take home point 2

Measurement of financed emissions is the first, and a key step, in planning for net-zero transition by banks. This would help in effective management of risks emanating from climate change and will help banks in identifying transition related opportunities. Target setting for decarbonization through reduction in financed emissions will create long-term economic value for stakeholders and for banks

Implementation Strategy

- *Pillars of decarbonization*
- *Case study: Bank of Philippines Islands*

Pillars of decarbonization

Baseline estimation of asset exposure to hard-to-abate sectors



Identification of products and services (transition finance strategy)



Selection of decarbonization pathways



Incorporation of client/company transition plans



Due diligence of stakeholders



Policies for high-emitting sectors and activities



Implementation strategy – Case study

Bank of Philippine Islands - Net Zero Strategy Roadmap

GHG accounting for Scope 1,2 and 3 emissions

Develop suitable interventions to support the strategy and mitigate climate risks

Coal commitment

CLIMATE-RELATED OPPORTUNITY	HORIZON	IMPACT
Loan financing programs, products, and services in support of climate risk mitigation <ul style="list-style-type: none"> • Funding of renewable energy, energy efficiency, green buildings, and sustainable agriculture for SMEs and corporates via BPI's Sustainable Development Finance (SDF) Program • Roof solar financing for individuals • Electric vehicle (EV) financing for individuals 	Short-term Medium-term Long-term	<ul style="list-style-type: none"> • New and additional interest income from climate-related loan offerings • Diversification of product offerings
Funding and arranging structures in support of climate transition, such as the Energy Transition Mechanism (ETM)	Short-term Medium-term Long-term	<ul style="list-style-type: none"> • Additional interest income from new loan offerings • Additional non-interest income from structuring and advisory services • Diversification of product offerings
Fund raising activities via green deposits and green bonds	Short-term Medium-term Long-term	<ul style="list-style-type: none"> • Potentially lower interest expense on the Bank's funding sources • Diversification of investor base
Sustainable investment fund products	Short-term Medium-term Long-term	<ul style="list-style-type: none"> • Additional non-interest income from fund management fees on climate-related funds • Diversification of product offerings

Decommissioning South Luzon Thermal Energy Corporation (SLTEC) coal plant

- **ACEN corporation target:** 100% renewable power generation by 2025
- **Energy Transition Mechanism (ETM) facilitated:**
 - Debt financing by BPI, complemented by equity
 - Early retirement of coal plant - cutting the coal plant's potential 50-year operating life by half
 - Elimination of coal from portfolio
 - Raising funds for renewable power generation projects
 - Product innovations combined with partnerships amongst stakeholders
- **Impact: Avoided 50 million metric tons of CO₂ emissions**

Governance

- *Role of governance in transition planning*
- *Case study: FirstRand Group*

Oversight of net-zero targets

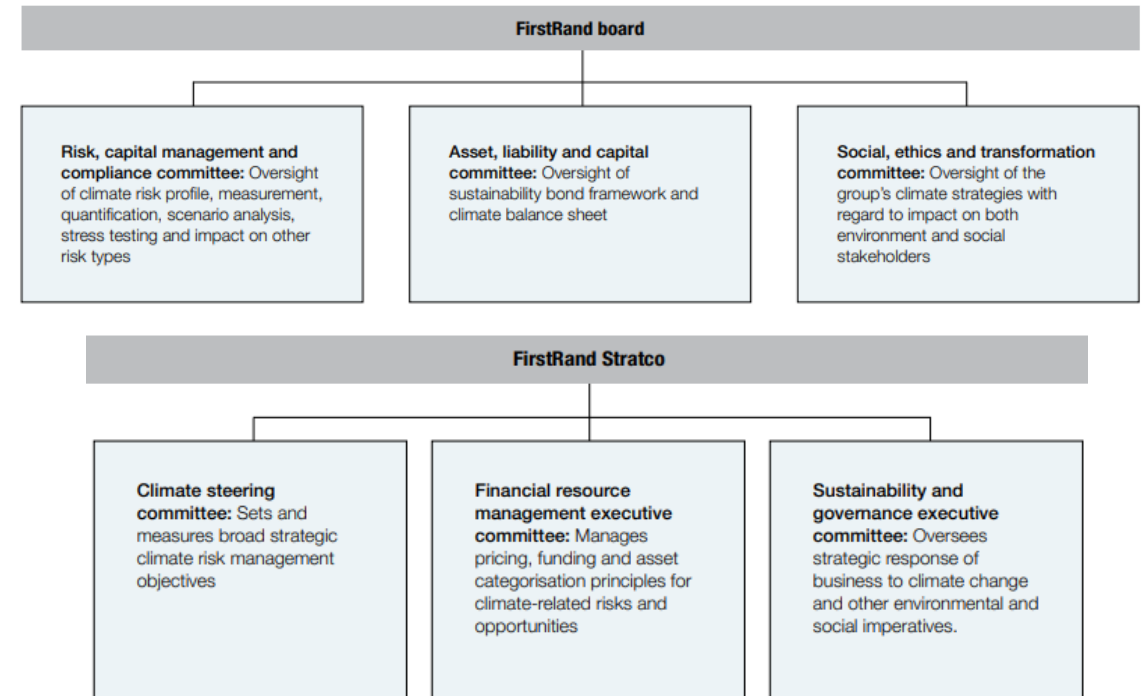
Transition-related roles and responsibilities

Performance-linked remuneration

Transition related skills

Case study – FirstRand Group

- Net-zero goal (Scope 1, 2 and 3): 2050
- Scope 1 & 2: Net-zero by 2030 for South African operations
- Group level climate roadmap includes phase-wise activities for improved governance:
 - Establishing climate change specialist committees
 - Board training on relevant climate-related risks and opportunities
 - Enhancing the integration of roles and responsibilities within governance structure
 - Internal audit of climate change management processes



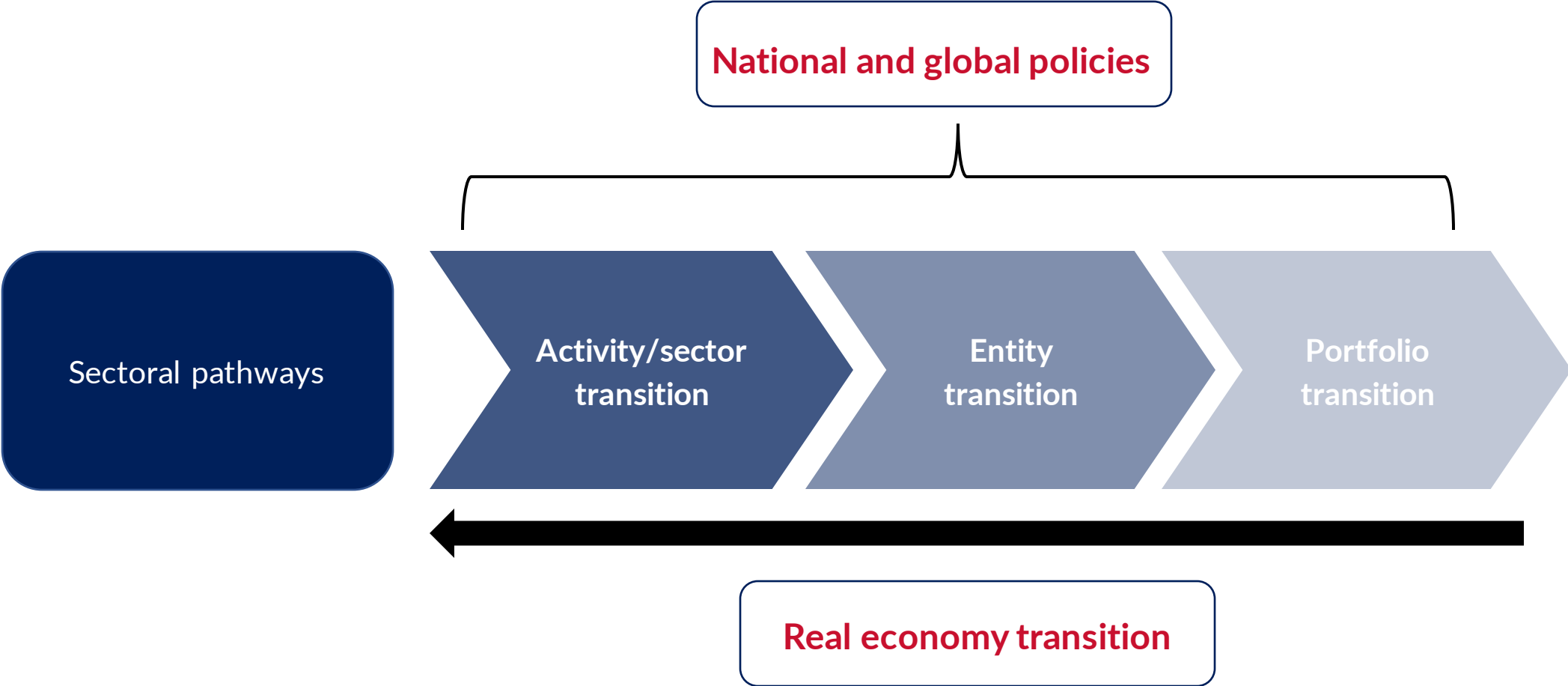
Take home point 3

Buy-in from the board and senior management is crucial for setting a commitment to net-zero transition of a bank. Such a commitment will percolate to all levels of a bank, where implementation strategies for targets across timelines will be set. This will act as a blueprint for measurable actions in transitioning towards eventual net-zero targets

Sectoral Pathways

- *Introduction and definition of sectoral pathways*
- *Applicability and elements of pathways*
- *Scenarios of energy mix and energy demand per sector*
- *Choice of scenarios – IEA*
- *Steps involved in sectoral transition*

Introduction to sectoral pathways



Definition of sectoral pathways

Sectoral pathways provide the link between the science of the remaining carbon budget and the detailed steps that a specific sector could take to reduce GHG emissions to a particular level in a specified timeframe

Such pathways provide a useful benchmark for financial institutions to shape their lending, investment, and insurance activities, and related services, in line with the net-zero transition in particular sectors



IEA scenarios are built on various underlying assumptions about how energy system might evolve over time

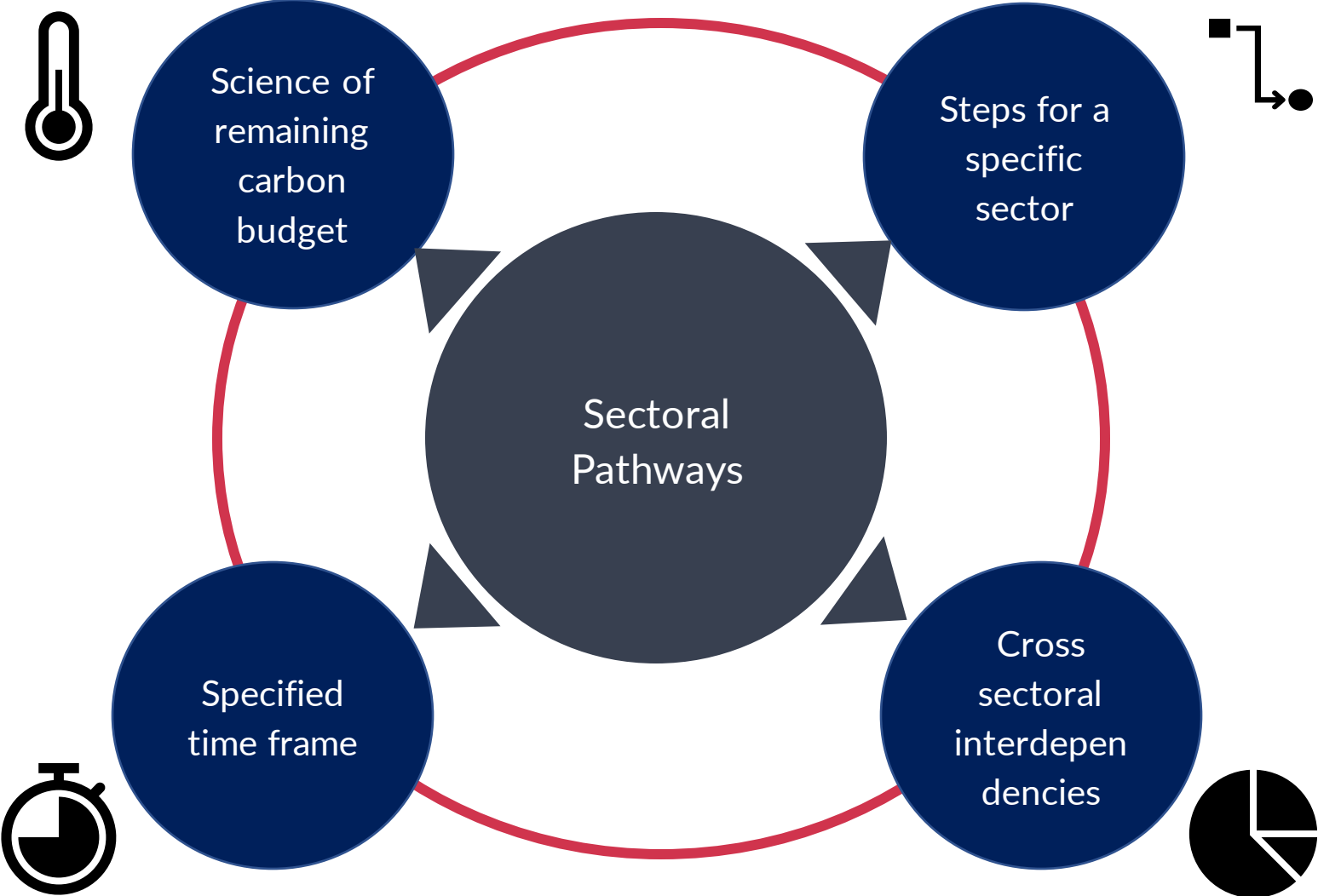
The IEA NZE (net zero emissions) by 2050 scenario sets out a pathway for the global energy sector to achieve net zero CO2 emissions by 2050



The Sectoral Decarbonization Approach (SDA) is a scientifically-informed method for companies to set GHG reduction targets necessary to stay within a 2°C temperature rise above preindustrial levels

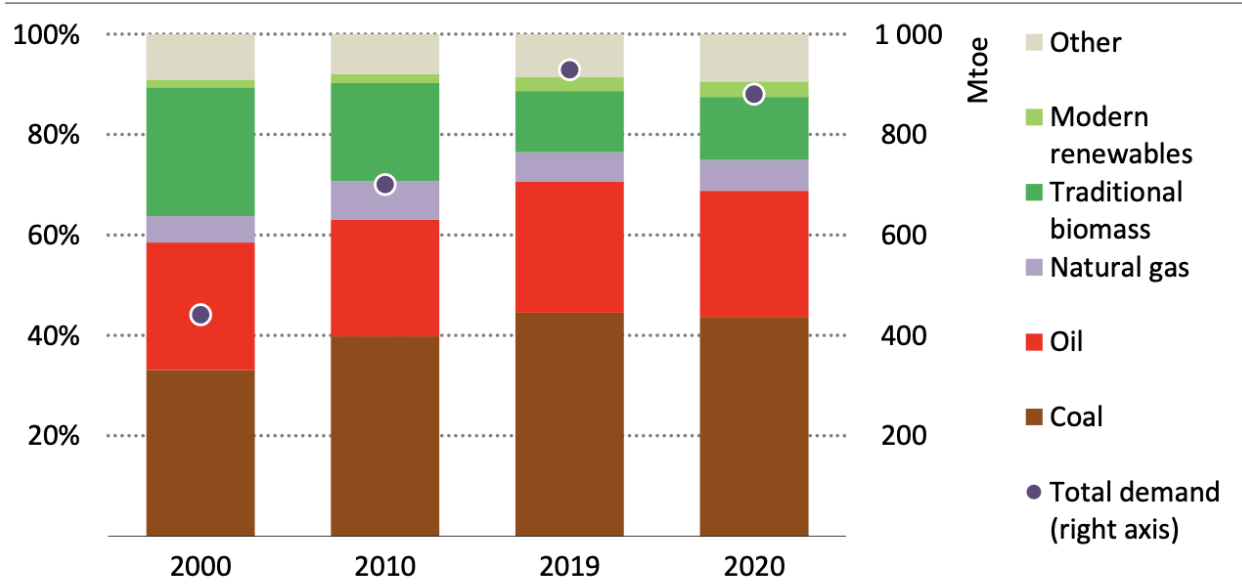


Elements of sectoral pathways

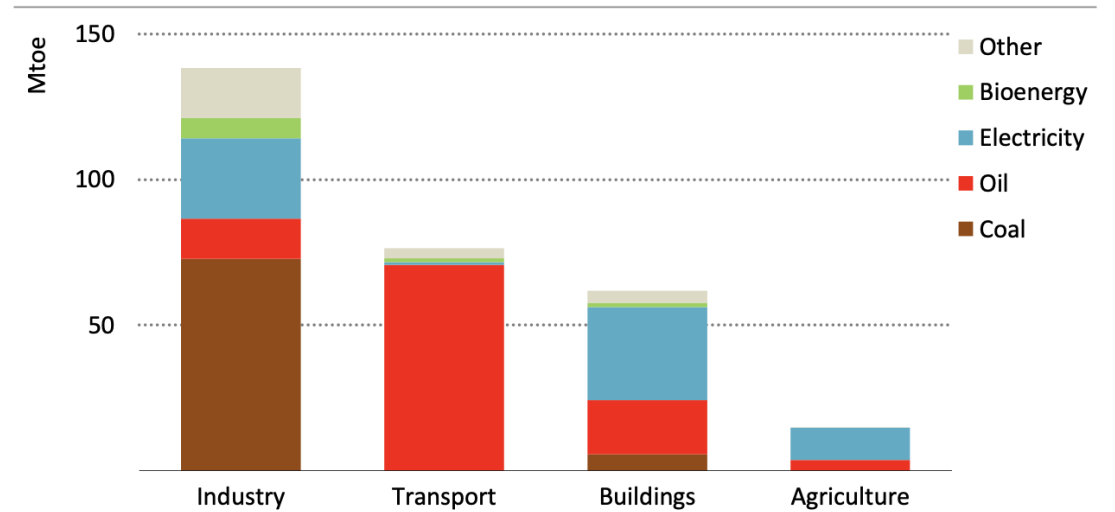


Energy mix and sector-wise carbon emissions

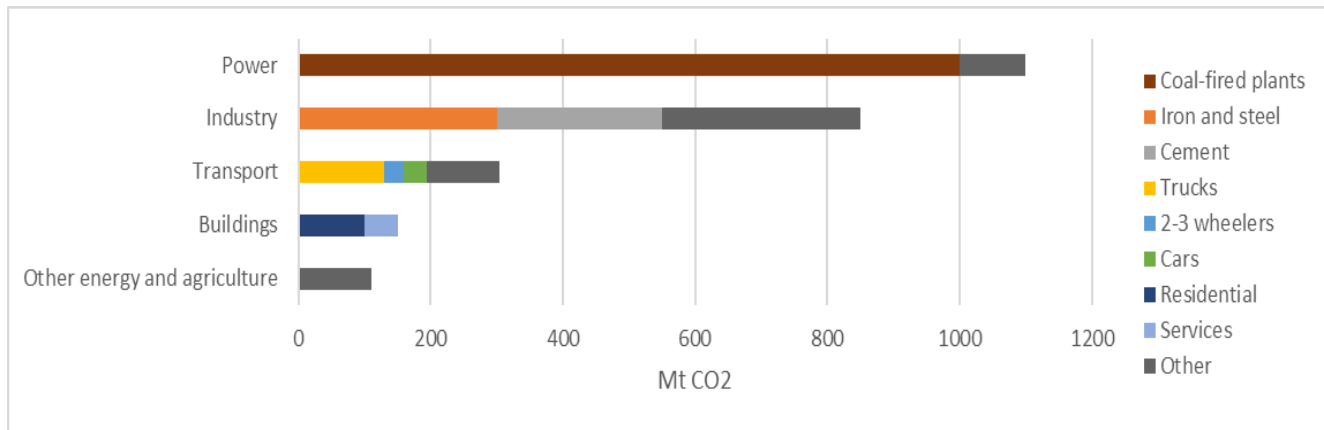
Total primary energy demand



Change in energy demand by fuel in selected end-use sectors – 2000-2019



Sector-wise Carbon emissions - 2019



Coal has strengthened its role as dominant source of energy over the years

Growth in energy demand has been the largest in Industry

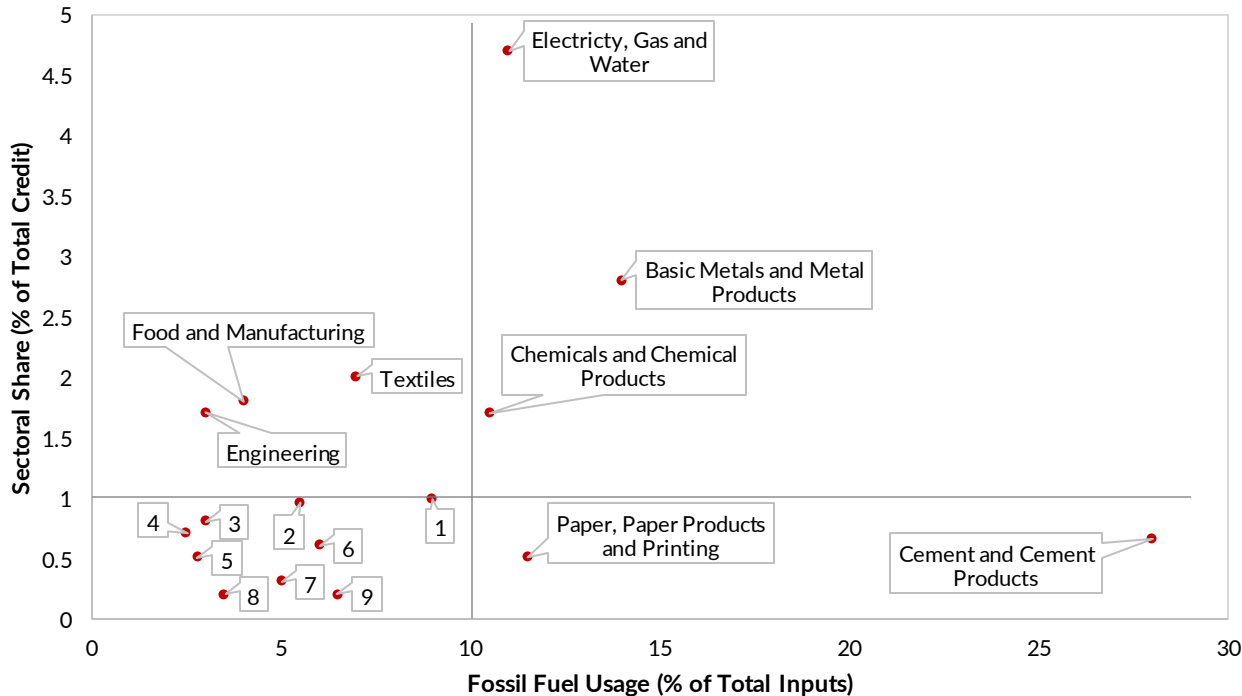
Power sector is the highest contributor to carbon emissions followed by Industry

Fossil fuel usage and credit intensity by sector

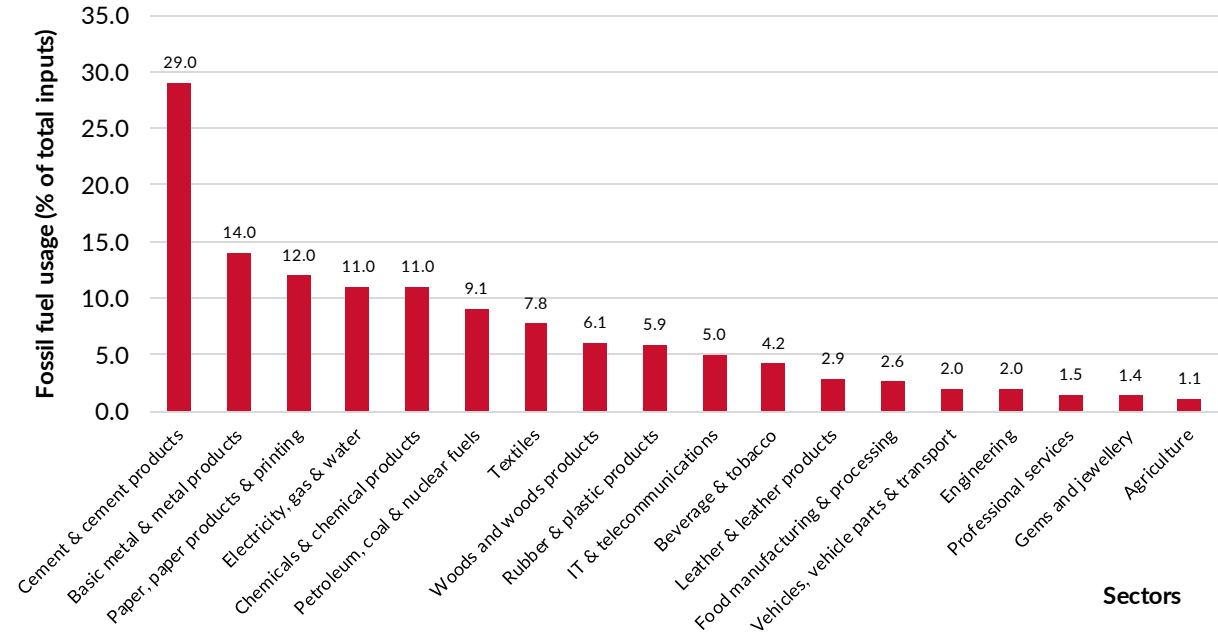
Cement and cement products along with basic metals are largest users of fossil fuel

Higher energy can also mean harder to decarbonize

Fossil fuel and credit intensity of Indian industries



Fossil fuel usage by sectors



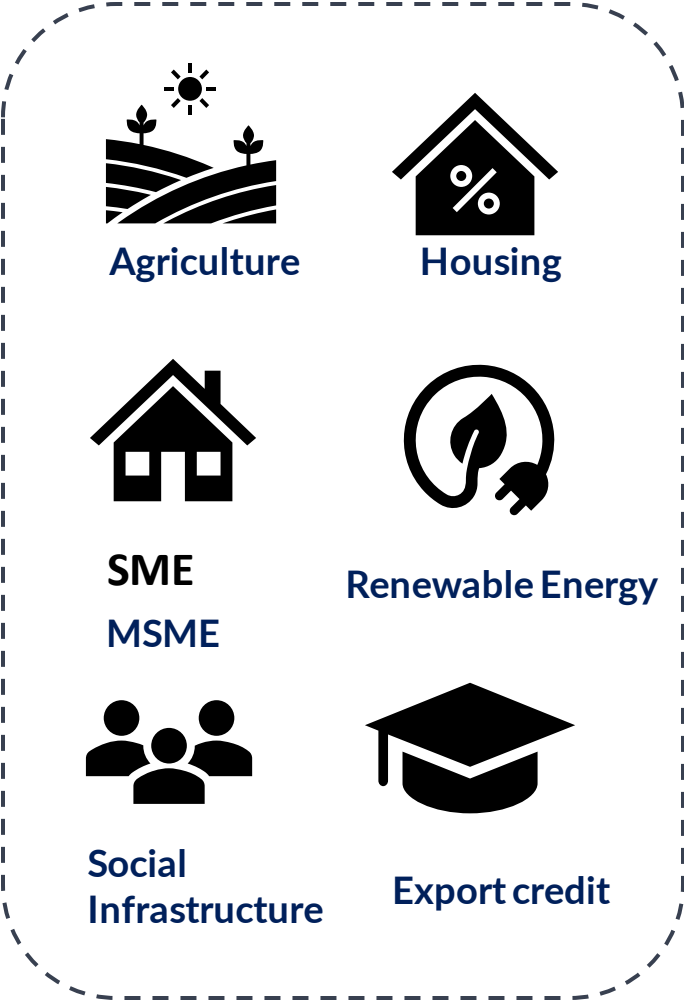
Electricity and basic metals absorb most of the bank credit

In contrast, cement and its products are high on fossil fuel usage, but low on credit intensity

1- Petroleum Coal and Nuclear Fuels, 2- IT and Telecommunications, 3- Vehicles, Vehicle Parts and Transport Equipment, 4- Gems and Jewellery, 5- Professional Services, 6- Rubber and Plastic Products, 7- Beverages and Tobacco, 8- Leather and Leather Products, 9- Wood and Wood Products

National policies and sectoral decarbonization

Priority Sector Lending



Agriculture

Housing

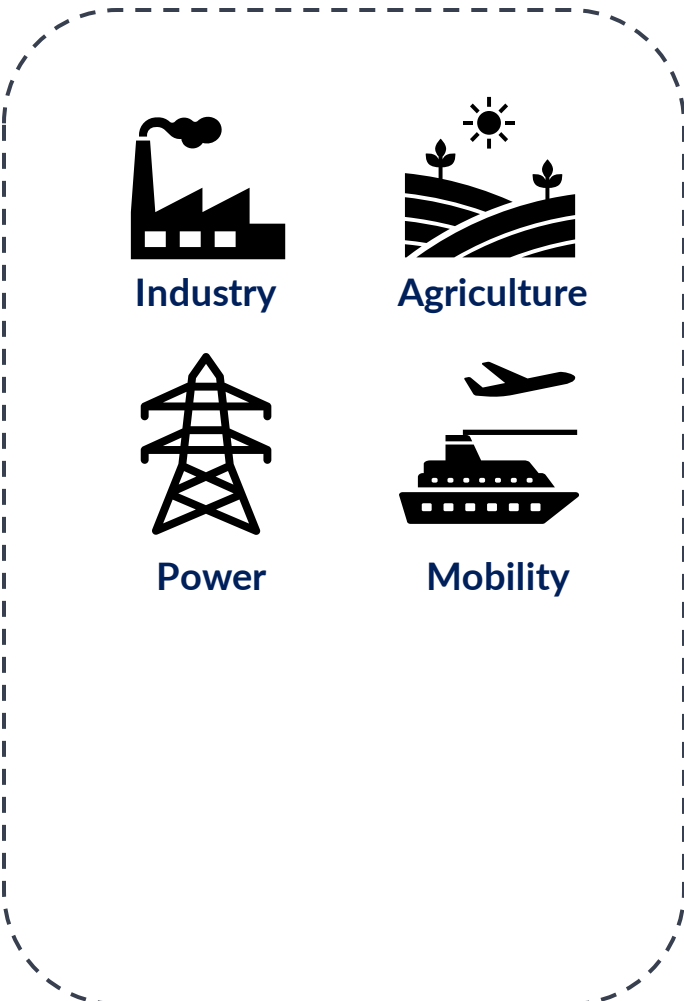
SME
MSME

Renewable Energy

Social Infrastructure

Export credit

High Emissions Contribution



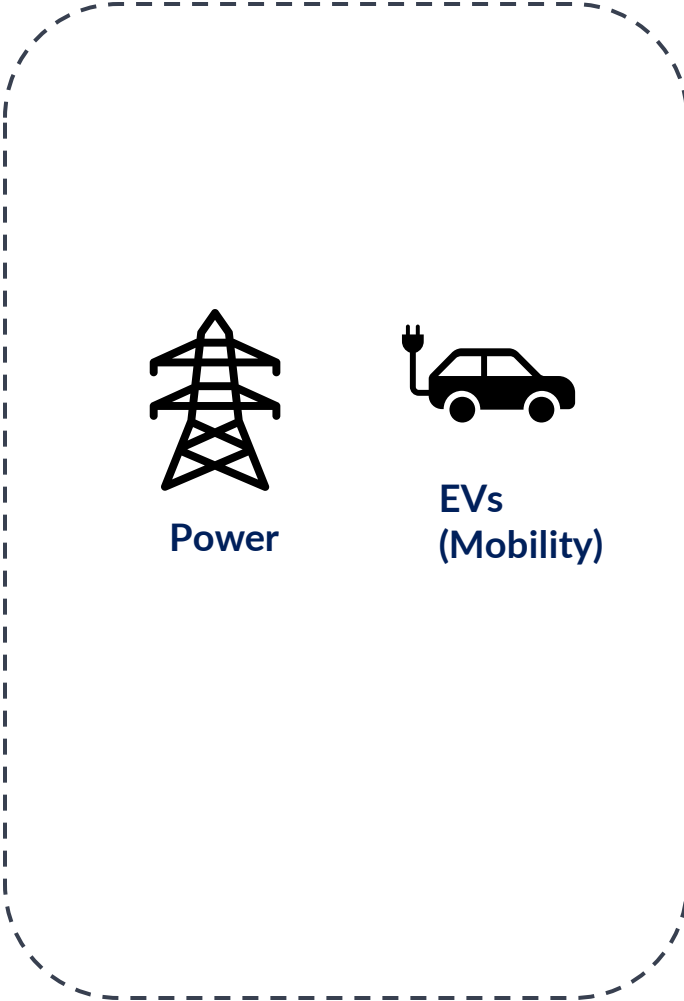
Industry

Agriculture

Power

Mobility

Mitigation Feasibility

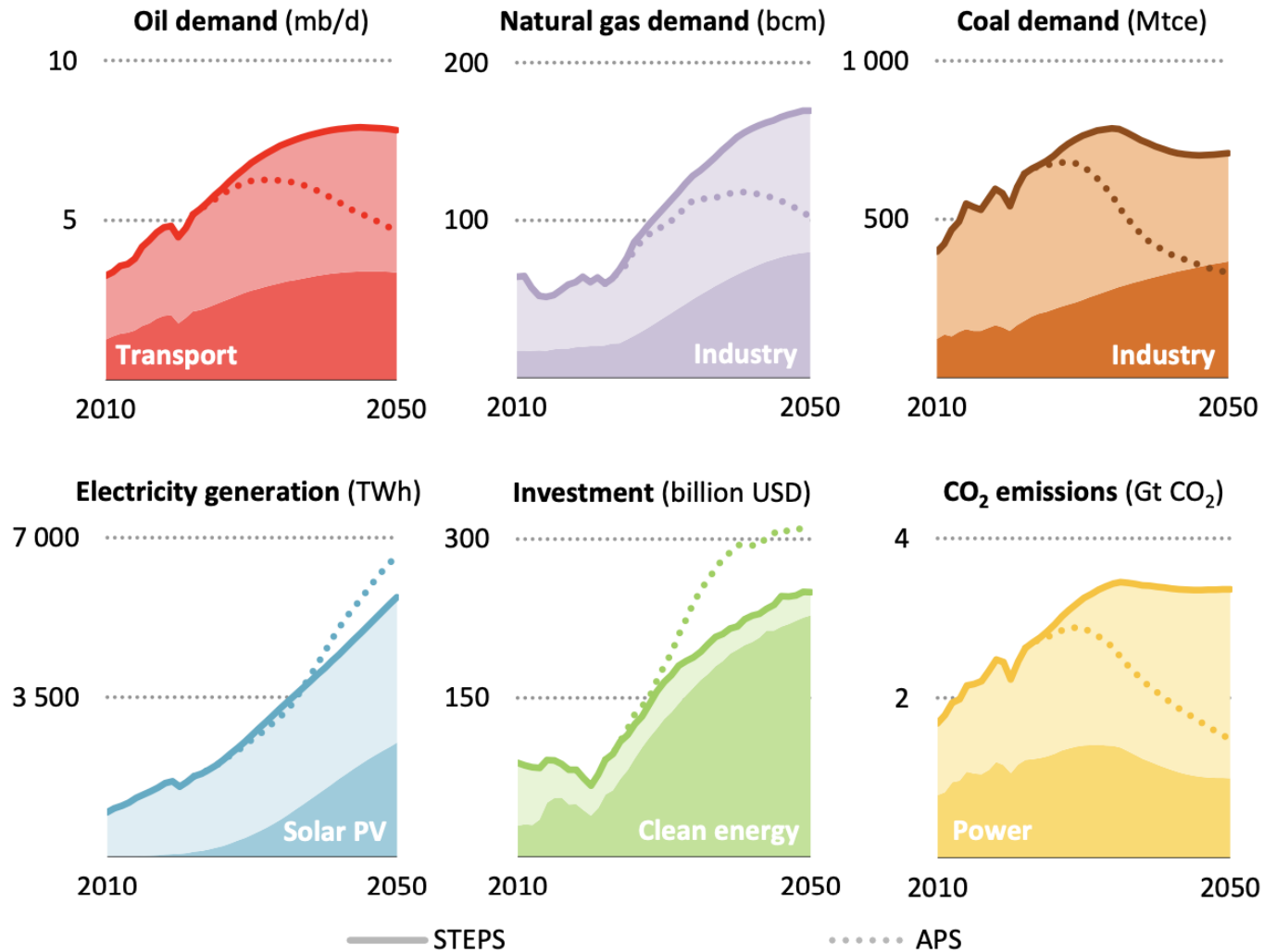


Power

EVs
(Mobility)

IEA energy scenarios for India

Key energy and emission trends in India - 2010 - 2050



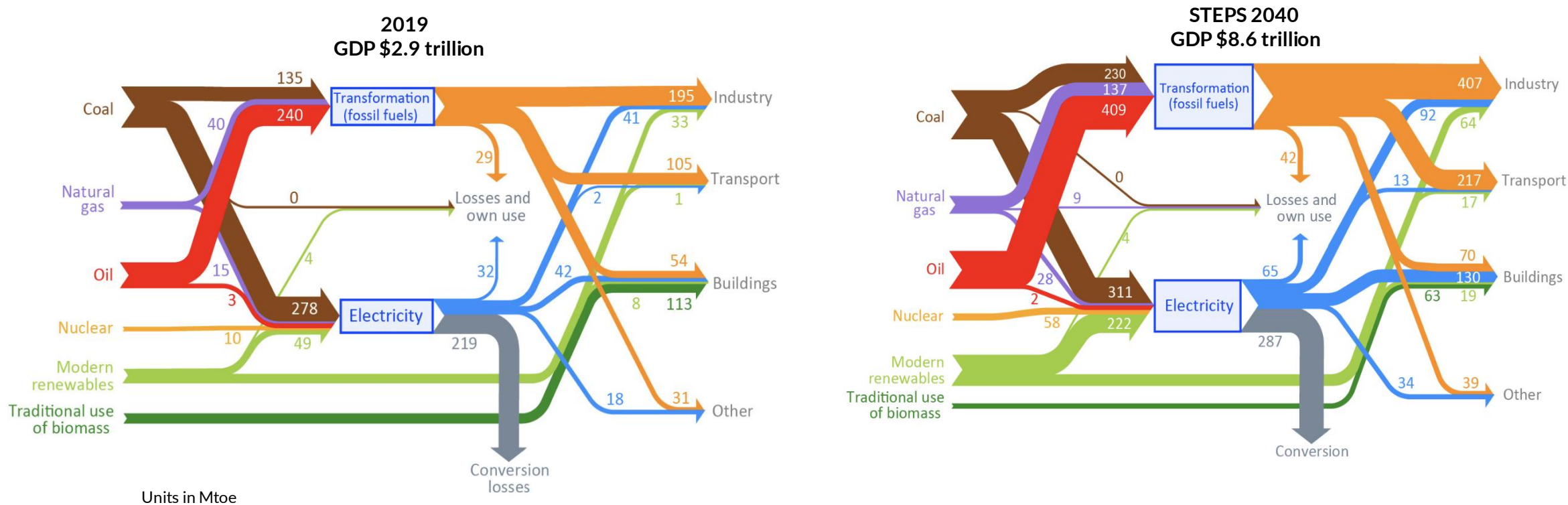
STEPS: The Stated Policies Scenario provides an outlook based on the latest policy settings

APS: The Announced Pledges Scenario assumes all national energy and climate targets made by governments are met in full and on time

India would witness largest energy demand growth than any other country in the next three decades - STEPS








India's CO₂ will increase by 30% by 2050 (one of the largest increases in the world) - STEPS

Flow of India's energy system by IEA scenario





- The graphs represent the flows of energy in India's energy system, and show how they change from 2019 to 2040 in the STEPS scenarios
- Currently, Coal, oil and biomass constitute almost 80% of the India's energy demand
- By 2040, India's energy consumption nearly doubles

An example: sectoral limits by DBS

Sector	Sub-sectors & types of financings included	Emission scopes included	Target metric	Reference scenario	2021 baseline (and reference start-point) ³⁰	2030 target (reduction vs. baseline)	2050 target
 Power	<ul style="list-style-type: none"> Power generation Power equipment manufacturers 	Scope 1 (generation) Scope 3 (equipment)	Emissions intensity (kgCO ₂ /MWh)	IEA NZE	260 (438)	138 (-47%)	0 (-100%)
 Oil & Gas	<ul style="list-style-type: none"> Upstream Downstream Integrated 	Scope 1-3	Absolute financed emissions (MtCO ₂ e)	IEA NZE ³¹	38.6 (N/A)	27.7 (-28%)	3.0 (-92%)
 Automotive	<ul style="list-style-type: none"> Automotive OEMs Captive automotive finance companies Automotive distributors Dedicated powertrain manufacturers 	Scope 3 (tailpipe emissions)	Emissions intensity (kgCO ₂ /vehicle-km)	IEA NZE ³²	0.120 (0.144)	0.052 (-57%)	0 (-100%)
 Steel	<ul style="list-style-type: none"> Steel production 	Scope 1-2	Emissions intensity (kgCO ₂ e/kg)	MPP – Tech Moratorium scenario	1.95 (1.90)	1.42 (-27%)	0.14 (-93%)
 Aviation	<ul style="list-style-type: none"> Airlines Aircraft leasing companies Secured aircraft financing 	Scope 1 for airlines and secured aircraft financing Scope 3 for aircraft leasing companies	Emissions intensity (kgCO ₂ /p-km)	IATA Fly Net Zero ³³	2020: 0.389 (0.191) 2019: 0.088 (0.107 ³⁴)	0.074 (-16%) ³⁵	0 (-100%)
 Real Estate	<ul style="list-style-type: none"> Real estate owner-operators Real estate SPVs REITs 	Scope 1-2 (operating emissions)	Alignment delta (%)	CRREM – Global Decarbonisation Pathways	-14.0%	≤0% (-42%)	≤0% (-95%)
 Shipping	<ul style="list-style-type: none"> Individual vessel financing 	Scope 1	Alignment delta (%)	IMO – Poseidon Principles	-11.8%	≤0% (-23%)	≤0% (-71%)

An example: sectoral limits by DBS (continued)

Sector	Sub-sectors & types of financings included	Target metric	2020 baseline (and reference start-point) ⁶⁴	2030 target (reduction vs. baseline)	2050 target
Food & Agribusiness 	<ul style="list-style-type: none"> • Primary growers, producers and processors • Integrated agribusiness companies • Food and beverage manufacturers • Food retail • Animal protein and feed producers 	Data coverage (% large corporate clients reporting emissions and physical output)	31% (N/A)	≥66%	N/A
Chemicals 	<ul style="list-style-type: none"> • Petrochemicals • Commodity & diversified chemicals • Industrial gases • Specialty chemicals • Fertilisers & agrichemicals 	Data coverage (% large corporate clients reporting emissions and physical output)	45% (N/A)	≥66%	N/A

Take home point 4

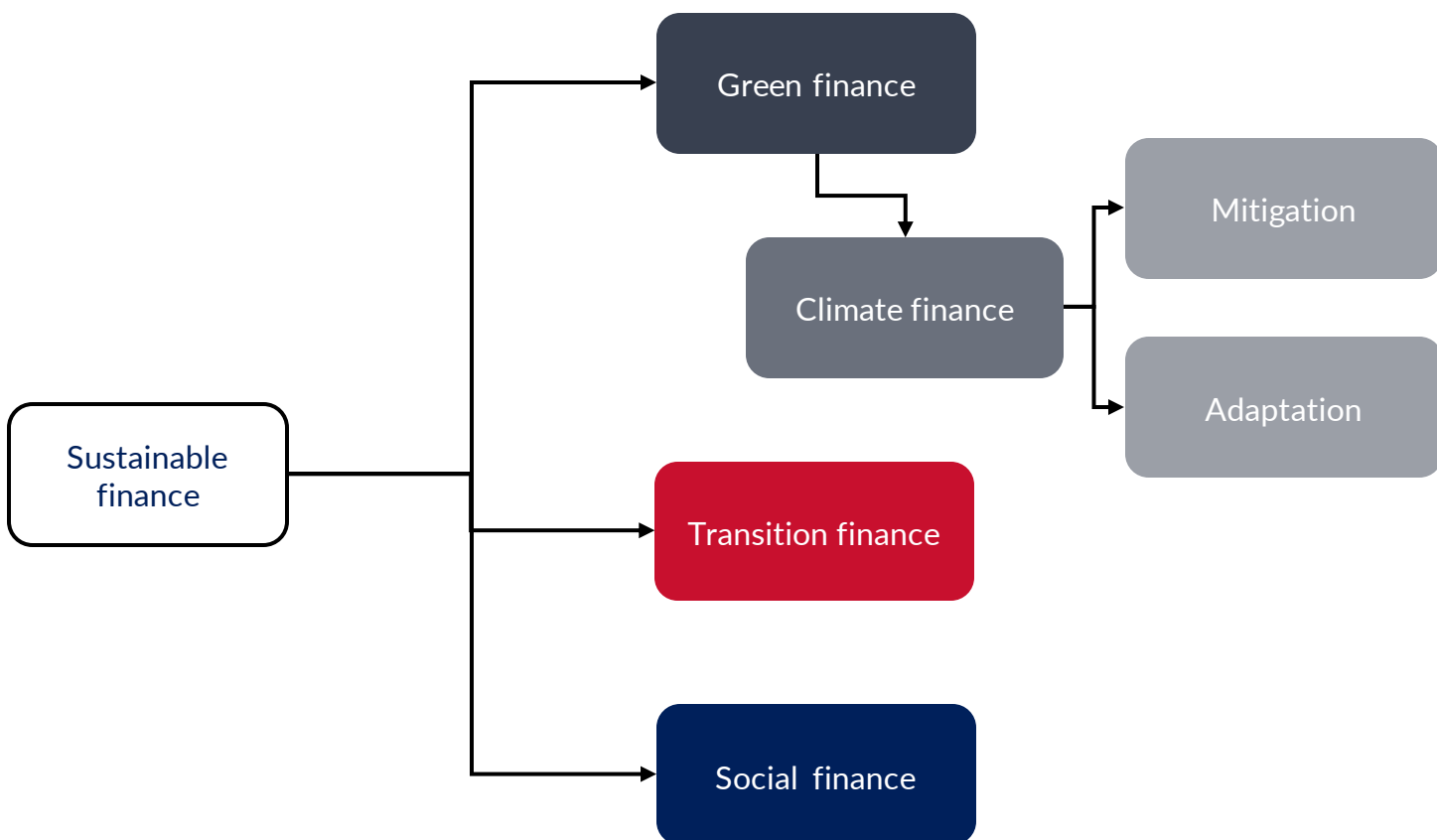
Banks have a real opportunity to bring transformative, climate positive change in the real economy through science-based target setting and taking sector specific steps towards reducing GHG emissions exposure

Break

Transition finance

- *Transition Finance: Meaning and trends*
- *G-20 pillars and frameworks*
- *The critical role of taxonomies*
- *Types of transition finance products*
- *Key elements of transition finance for a bank*
- *Case study*

Transition finance: meaning



Transition finance definitions

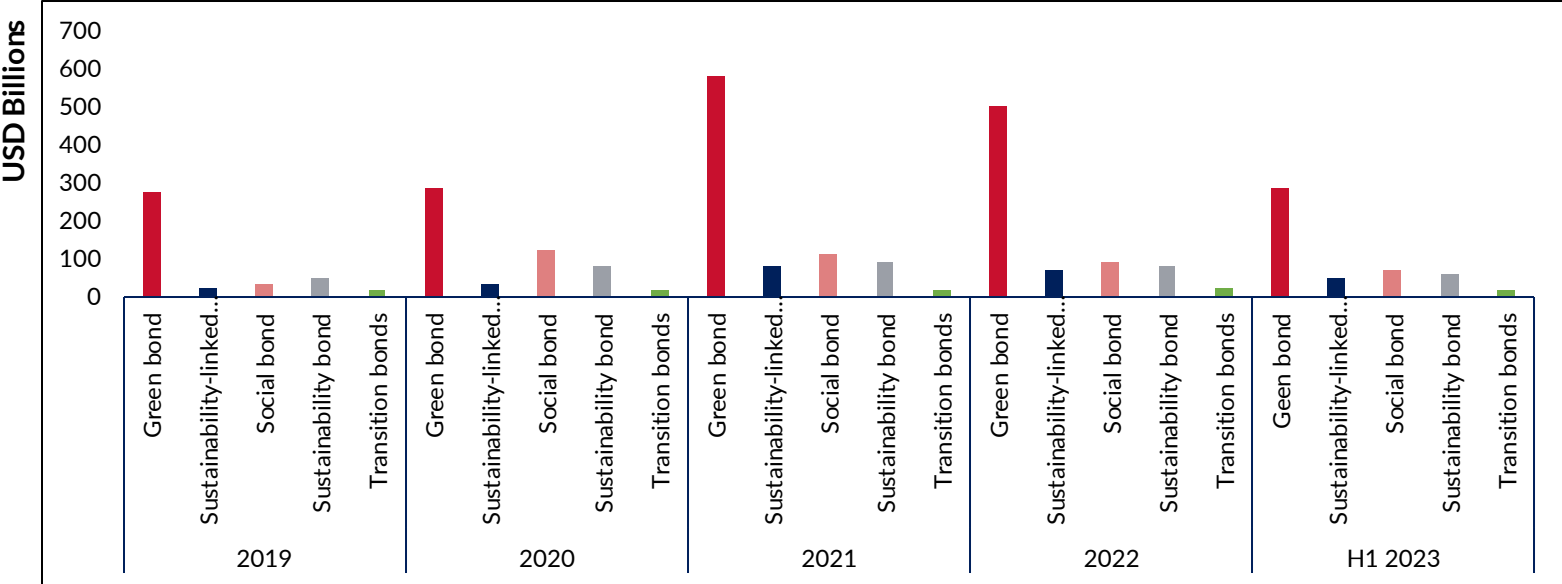
“Transition finance is industry inclusive (spanning green to brown) and aims to offer especially high-emitting companies financing for the shift towards a climate-neutral, or even positive, status quo”
(Nordea Sustainable Finance Advisory)

“Finance raised or deployed by corporates to implement their net-zero transition, in line with the temperature goal of the Paris Agreement and based on a credible corporate climate transition plan”
(OECD Guidance on Transition Finance)

Transition finance means any form of financial support that helps high-carbon companies start to implement changes towards low carbon and, in the long term, greener solutions

The rise of sustainable finance: global and national

Global: trends in sustainable finance instruments:

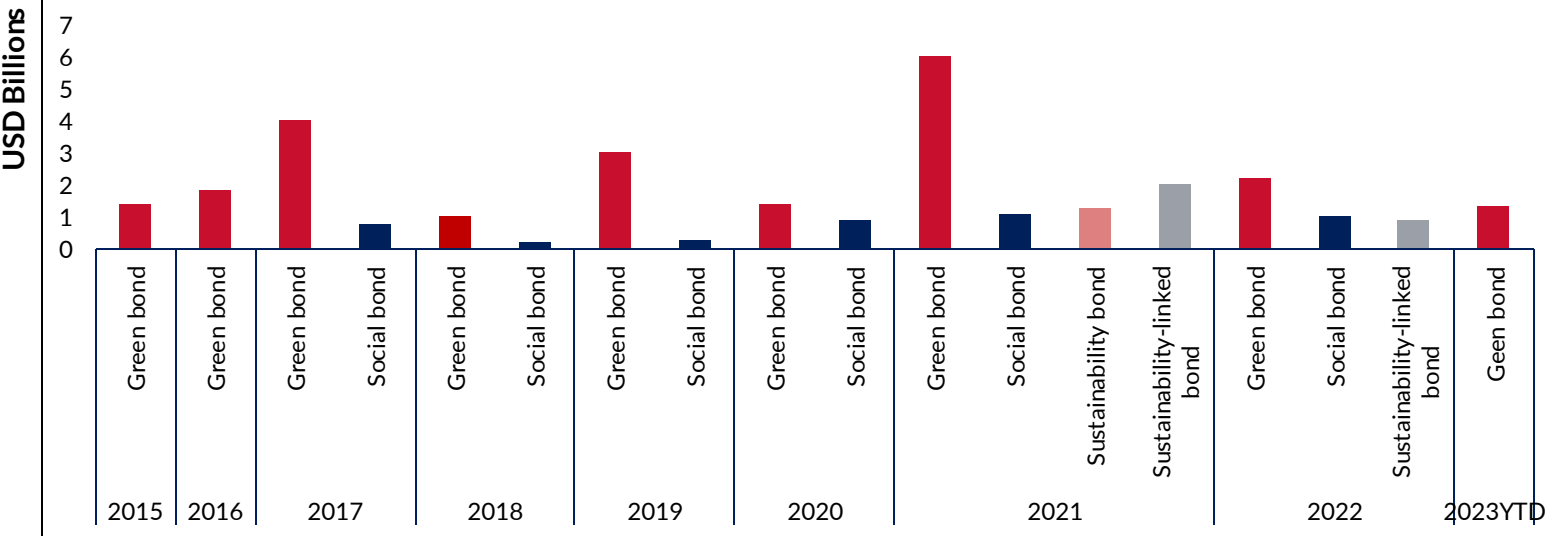


GSS+ debt crossed \$4 trillion mark by the end of H1 2023

Noticeable surge in the issuance of SLBs since 2020

Cumulative issuance of transition bonds crossed \$ 11 billion in Q1 2023; slower growth in H1 2023 compared to H1 2022; Japan and China fastest growing markets due to clear policy developments

India: trends in sustainable finance instruments:



Green bonds dominated the labeled bond market, totaling \$20 billion by Jan 2023

Sustainability and sustainability-linked bond issuances began in 2021

As transition instrument definitions standardize, market is likely to embrace emerging transition finance products

Transition finance: G20 pillars and frameworks

22 high-level principles divided among 5 pillars

Pillar 1: Identification of transition activities and investments

Pillar 2: Reporting information on transition activities and investments

Pillar 3: Developing transition-related finance instruments

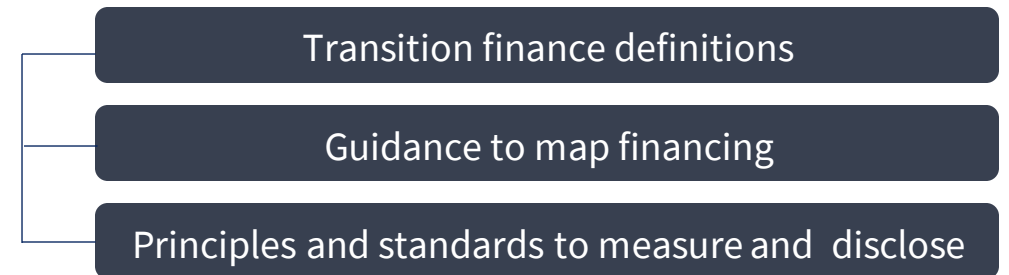
Pillar 4: Designing policy measures

Pillar 5: Assessing and mitigating negative economic impact of transition activities and investments

Frameworks and guidances on transition finance



भारतीय प्रतिभूति और विनियम बोर्ड
Securities and Exchange Board of India



The critical role of taxonomies



As of June 2023

(Institute of the Americas, 2023)



ASEAN TAXONOMY BOARD

International Platform on Sustainable Finance

Common Ground Taxonomy – Climate Change Mitigation

Types of transition finance products

Sustainability-linked loans

Sustainability-linked bonds

Transition bonds



Forward-looking, performance-based debt instruments



Tied to sustainability performance targets and KPIs



Green corporate financing



Potential pitfalls around setting credible targets



Use of proceeds instrument



Ring-fencing to pre-defined activity or entity level strategy with a transition pathway



General lack of market standards and definitions



Development of sector-specific criteria underway

Transition strategy of borrowers

Key elements of transition finance for a bank

Internal taxonomy

- Acts as a reference for decision making
- Classifies lending for 'green', 'yellow' or 'red' categories
- Standardizes sustainable lending practice

Asset Tagging

- Aids quantification of transition financing
- Provides link to underlying performance of assets
- Catalyzes increased lending to transition related initiatives

Transition related targets

- Aligns internal transition goals to borrowers' decarbonization efforts
- Loan covenants for sustainability related targets
- Use of science-based measures

Innovating products and forging partnerships

- Risk – return – impact approach
- Context driven innovations
- Partnerships for scaling impact and data availability

Case study: Transition-linked loan by Mizuho Bank

Borrower

- Kawasaki Kisen Kaisha, Ltd. – a Japanese transportation company, owning a fleet that includes dry cargo ships, container ships, tankers

Nature of transaction

- General syndication
- 5-year loan of approximately JPY 110 billion (USD 991 million)
- Other lenders include leading Japanese banks
- One of the largest transition loans in the country

Transition aspects of the loan

- Transition – linked loan without specific use of proceeds
- Working capital with pre-determined Sustainability Performance Targets (SPTs) in a matrix linked to interest rate terms
- Selected as a model example by the Ministry of Economy, Trade and Industry in its FY21 Climate Transition Finance Model Project
- Second transition loan to same borrower – 1st loan was a transition loan with specified use of proceeds

Sustainability Performance Targets

1. Target for overall greenhouse gas emissions

2. Target for CO2 emissions per ton-mile

3. Carbon disclosure rating administered by UK-based CDP

Borrower preparedness

- Presence of transition linked finance framework, with third party evaluation from Japan Credit Rating Agency
- Adherence to national guidelines on transition finance and international best practices
- Active engagement of Mizuho Bank with borrower
- Repeat loan by same lender, indicating robustness of decarbonization strategy

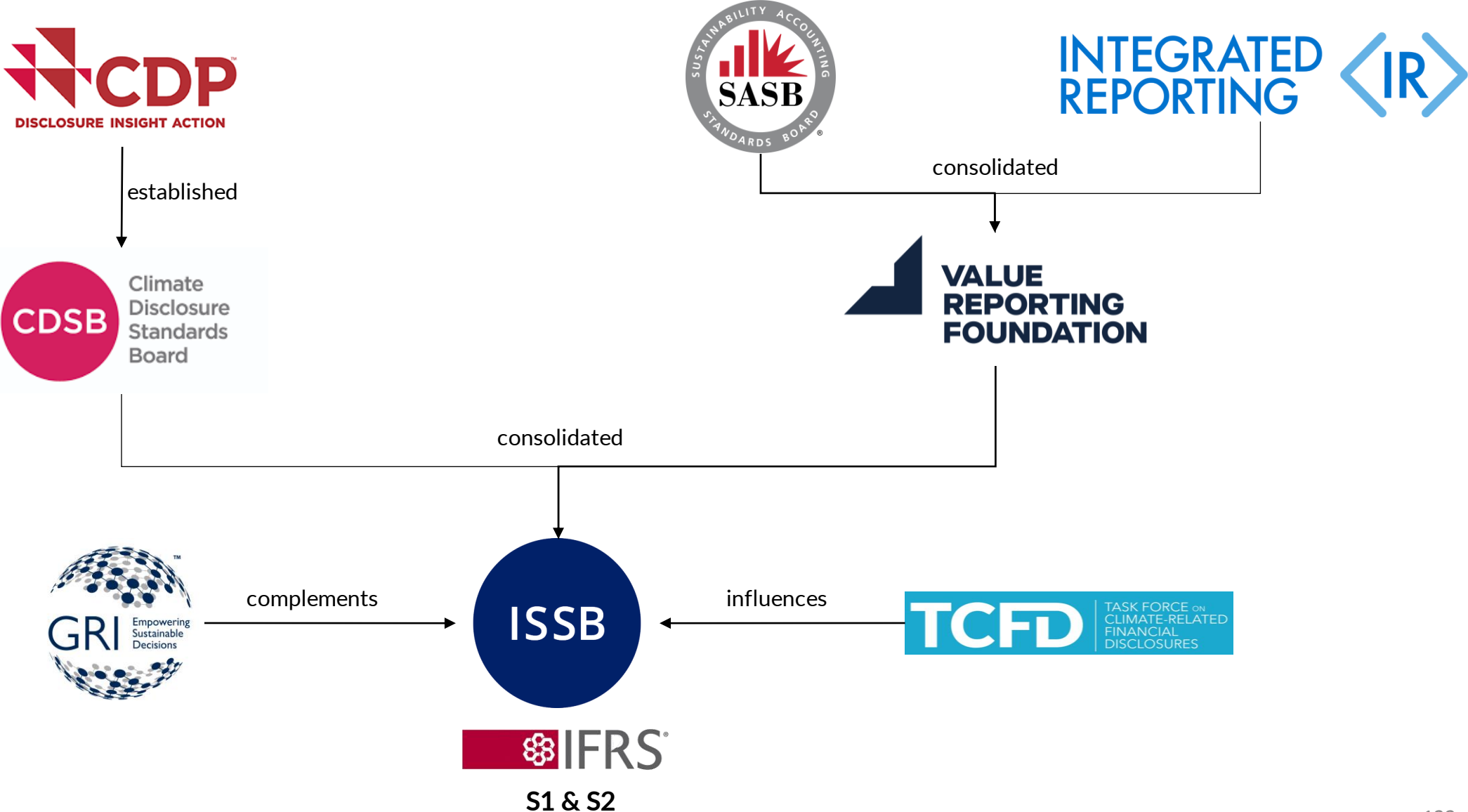
Take home point 5

There is an immense opportunity for banks to tap into the potential for funding transition finance. Done right, by innovating the right financial products that are linked to borrowers' transition strategies, banks can accelerate decarbonisation of the real economy and their own portfolios

Transition plan reporting

- *Multiple, non-standard ways of reporting*
- *Carbon Disclosure Project (CDP)*
- *IFRS: Global baseline reporting for investors*

Multiple, non-standard ways of reporting



(Kirkland & Ellis, 2022)

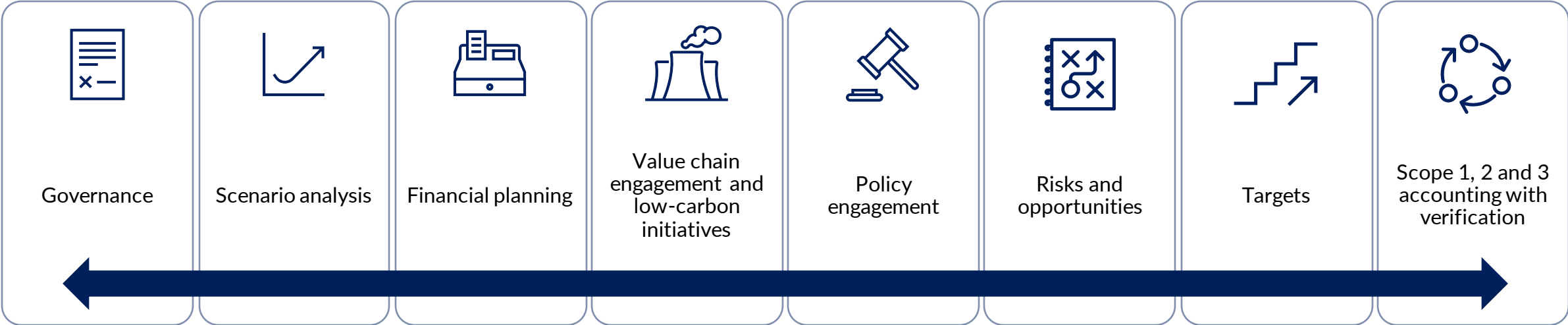
CDP and credible transition plan reporting

Credible transition plan

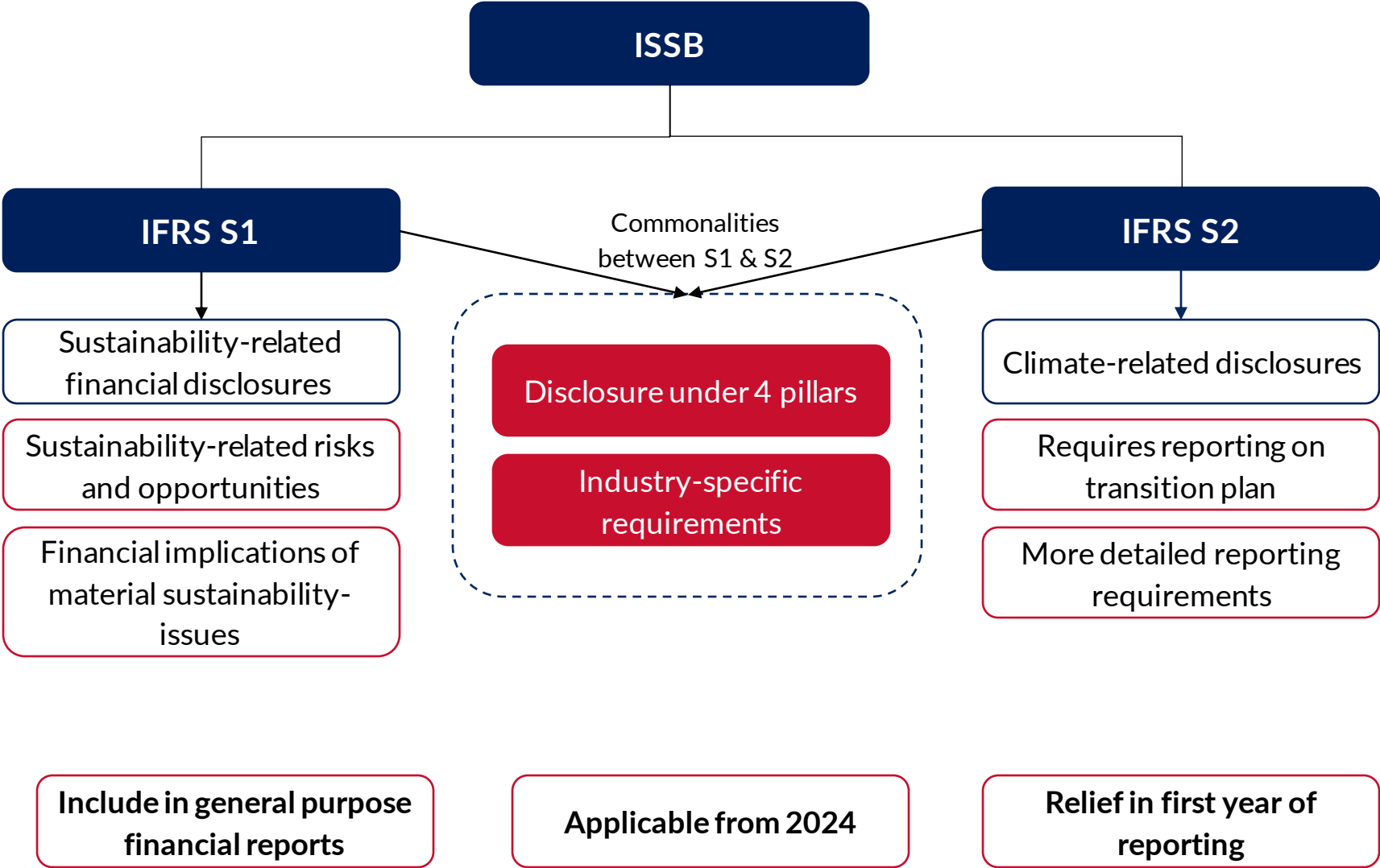
- Transition strategy aligned to 1.5°C and science-based targets
- Verifiable and quantifiable key performance indicators (KPIs)
- Integrated into an organization’s existing annual reporting
- 6 principles by CDP
- Key reporting requirements

“A credible climate transition plan is a time-bound action plan that outlines how an organization will achieve its strategy to pivot its existing assets, operations, and entire business model towards a trajectory aligned with the latest and most ambitious climate science recommendations.” - CDP

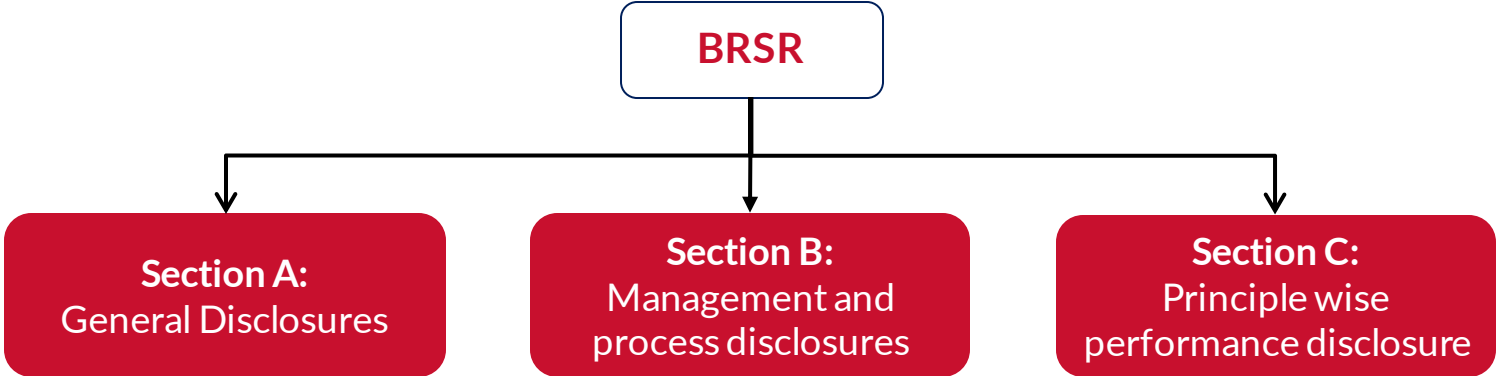
Elements of a credible climate transition plan - CDP’s climate change questionnaire



ISSB: global baseline reporting for investors



BRSR structure and relevance to transition



Principle 6: Businesses should respect and make efforts to protect and restore the environment

Details of energy consumed from Renewable Energy and non-renewable energy



Source-wise scope 3 emissions details in the format specified in guidelines given by BRSR



Evaluation of the company's value chain to identify the materials that can cause environmental harm



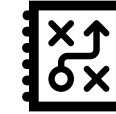
What makes up for a credible transition plan?



Baseline emissions



Emissions reduction target



Portfolio decarbonization strategy



Governance and Accountability



Stakeholder engagement



Complete Transparency

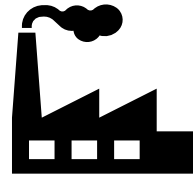
Engagement with stakeholders

- *Engagement strategy: portfolio companies, industry, government*
- *Case study: Mizuho Financial Group*



Portfolio companies

- Provide support in developing and implementing near-term, science-based transition plan
- Raise awareness among SMEs about decarbonization expectations
- Develop assessment methodologies/dashboards to track performance



Industry

- Discussion and sharing of non-confidential tools, data, & methodologies among banks
- Share best practices, common approaches, frameworks
- Join relevant industry groups focused on specific sectors



Government

- Discuss clean investment plans to help attract private investment in climate solutions
- Seek opportunities for senior-level dialogue with government leaders
- Thought leadership for policy action on climate change

Case study: Mizuho Financial Group




Mizuho engagement strategy: overview

- Engages with 1,300 corporate clients on sustainability initiatives, including 600 clients focused on climate change
- Delivers tailored financial solutions to clients and non-financial solutions, including transition planning, decarbonization support, and risk management solutions

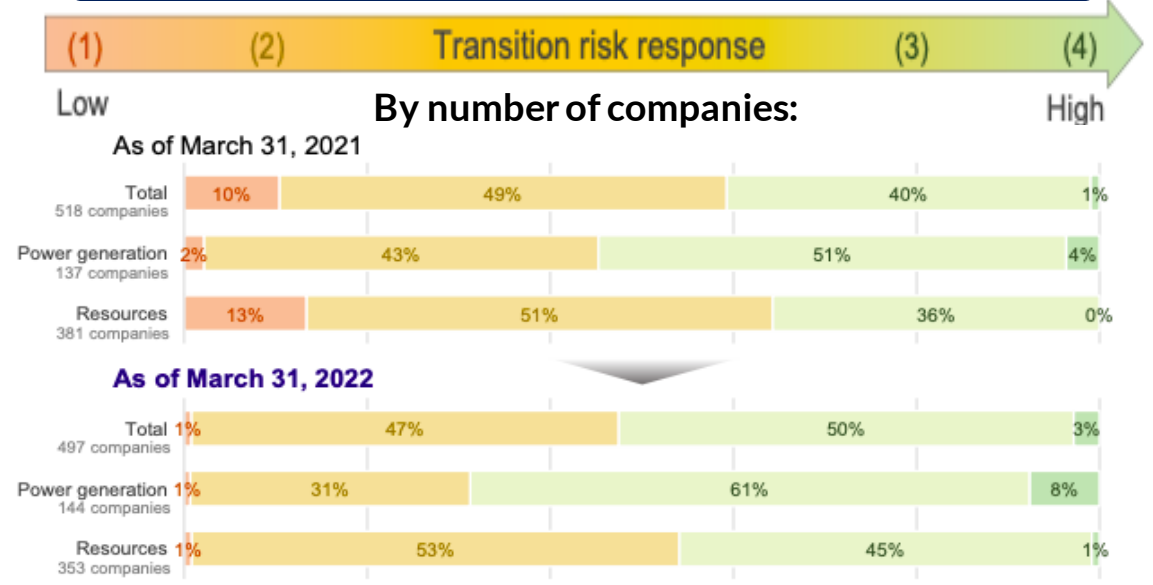
Client classifications to assess responses to transition risk

- Has **no policy** to address transition risk and has set no targets
- Has a **strategy** to address transition risk and has set targets
- Has set **targets aligned to the Paris Agreement** and is implementing specific initiatives
- Has met the above requirements and also obtained **third-party certification**

Commitment to strengthen stakeholder engagement

-  In-depth engagement with clients
-  Participation in policy engagement
-  Public private partnerships

Mizuho's client progress in addressing transition risk



Conclusion and way forward

- *Summary*
- *Action points*

Conclusion and way forward

- 1 Transition planning by banks is imminent
- 2 Measurement of financed emissions is the first step towards long-term climate strategy by banks
- 3 Setting sectoral limits towards portfolio decarbonization is essential for transition
- 4 Proactive engagement with stakeholders will aid in smooth transition process
- 5 Potential transition finance opportunities are immense
- 6 Disclosing transition plan under appropriate frameworks is crucial for credibility

Q&A with participants

End of Day 2: Vote of thanks

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