

MOODY'S

Understanding the impact of Climate

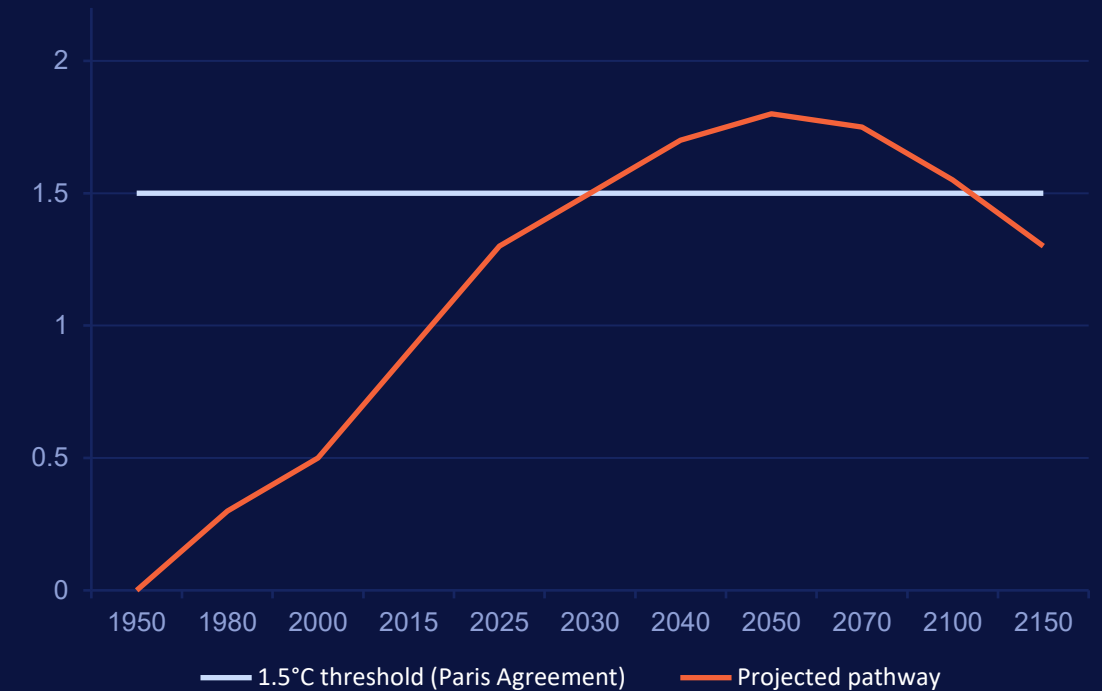


1.5°C

The threshold the world is now set to cross — likely within the next few years.

UNEP's first-ever report to treat 1.5°C overshoot as effectively unavoidable — shifting the global conversation from “can we stay under it” to “how high does the peak go, and how fast can we bring it back down.”

GLOBAL AVERAGE TEMPERATURE VS. PRE-INDUSTRIAL (°C)



1 CROSS
~2030

2 PEAK
~1.8°C

3 DECLINE
back toward 1.5°C

“This summer’s scorching heat, raging wildfires and deadly floods are a warning of what lies ahead.” — UNEP, Limiting Overshoot (2 September 2026)

How will climate impact our way of living?

Temperature Rise means Increase to the frequency and severity of physical risk perils

	A glimpse of 2050	Global scientific projections	Socio-economic impact
 Extreme heat	300m+ people could be affected by heatwaves in India ¹	1-in-1,000-day hot extremes 5x as likely with 0.85°C warming ⁷	~60k deaths in European heatwave (2022) ⁸
 Flood	5x increase in annual flood losses expected in EU ²	70% of population could face 5x surge in flood impacts at +4.0°C ⁹	2021 flooding losses were \$18.4bn in China & \$3.2bn in India ¹⁰
 Drought	80% chance of decade-long droughts in the US starting 2050 ³	Current 1-in-100-year droughts could occur every 2-5 years ¹¹	Food lost to drought can feed 81m people daily ¹² (= population of Germany)
 Sea-level rise	~1.3m Bangladeshis could be forced to migrate due to sea-level rise ⁴	Global mean sea level expected to rise 1m by 100 per RCP8.5 ¹³	Jakarta is sinking ~28 cm yearly ¹⁴ & facing \$186m p.a. in flood damage ¹⁵
 Storm	3x increase in annual probability of typhoons in Tokyo ⁵	Hurricane frequency could double by 2050 ¹⁶	~8,500 FTE jobs & \$1.5bn of value lost in Cyclone Debbie (2017) ¹⁷
 Wildfire	~35% increase in area burnt yearly by bushfires in Sydney ⁶	Wildfires likely to increase by a third ¹⁸	Canadian wildfires displaced 230k people & claimed 8 lives (2023) ¹⁹

Source: World Economic Forum

Pakistan Lens

1 Heat Stress

Jacobabad and other Sindh/Punjab cities regularly exceed 50°C, hitting labour productivity, energy demand and infrastructure.

2 Water Stress

One of the world’s most water-stressed countries; Indus basin groundwater depletion strains agriculture, industry and urban supply.

3 Monsoon & Flood Risk

The 2022 floods caused **\$30bn+ in damage**; 2025 floods added a further PKR 853bn loss — recurring, not one-off, risk.

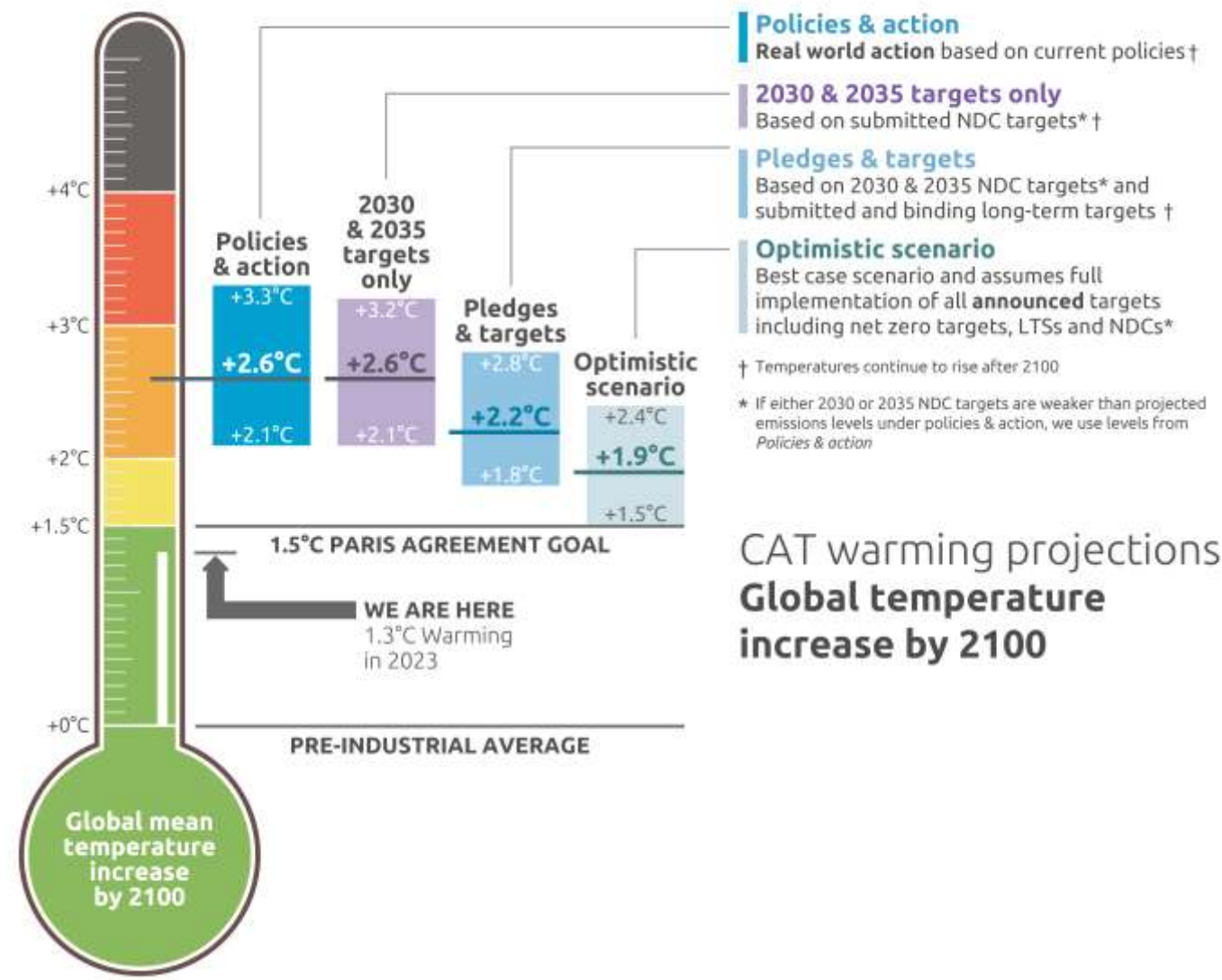
4 Glacial Melt & GLOF Risk

Home to more glaciers than anywhere outside the poles (Karakoram/Hindu Kush); glacial lake outburst floods (GLOFs) are a distinctive, growing hazard.

5 Agricultural Vulnerability

Cotton and Basmati rice — both flood- and monsoon-exposed — anchor rural livelihoods and export earnings.

Current Policies place global temperatures at ~2.6c Pathway



CAT warming projections
Global temperature increase by 2100

Global climate policy remains materially off track

Climate risk is no longer just a disclosure topic. It is increasingly a cost, revenue, supply-chain and resilience issue

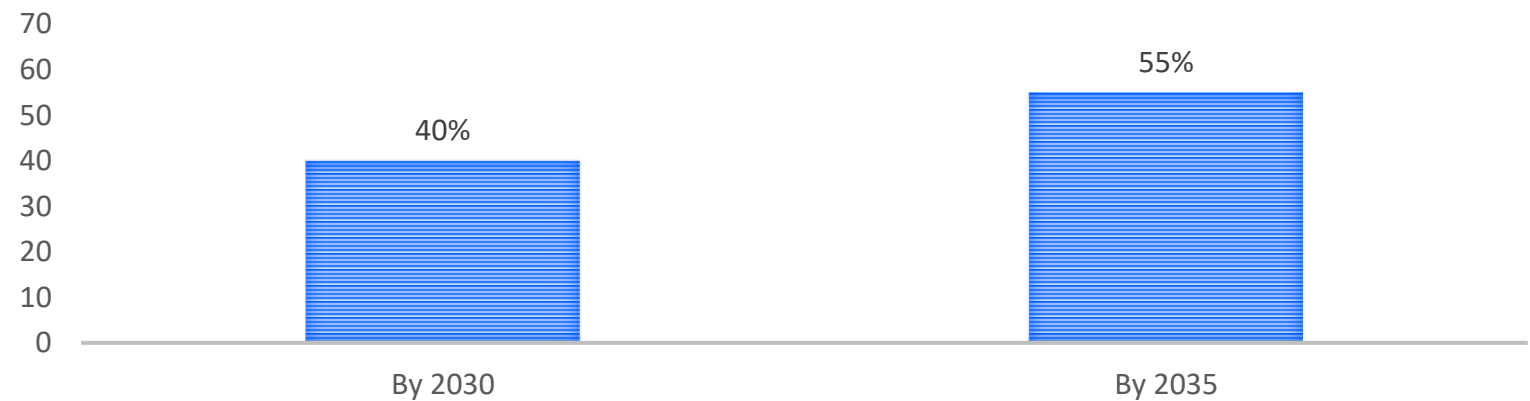
+2.3%

Growth in total global GHG emissions in 2024 vs. 2023 levels

40%

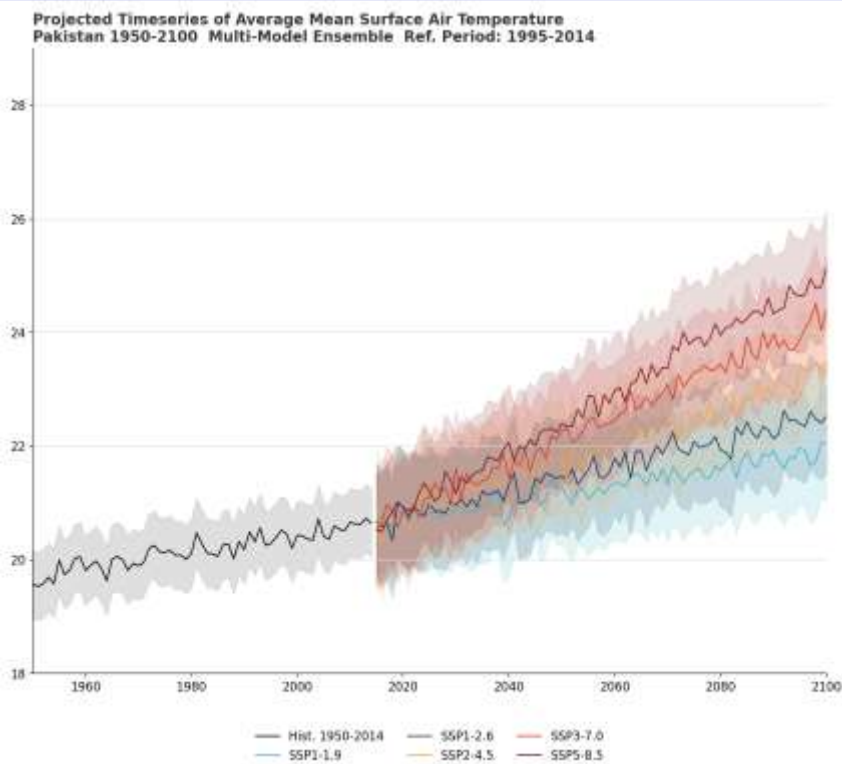
Cut required by 2030 (vs. 2019) to stay on track for 1.5°C

REQUIRED GHG EMISSIONS CUTS TO STAY BELOW 1.5°C



Countries remain off track to deliver on globally insufficient mitigation pledges for 2030. The prevailing pace of the carbon transition will not prevent significant climate impacts and associated economic costs — making progress on adaptation planning increasingly important for credit strength.

Pakistan Sustainability Snapshot



• Emissions Reduction Target

- » NDC 3.0 submitted (Sept 2025): **no formal net-zero date yet set**
- » Reduce GHG emissions 50% below business-as-usual by 2030 (17% unconditional, 33% conditional)
- » Renewable energy (incl. hydro) to reach 60% of generation by 2030

• Reporting and Supervision

- » SECP: mandatory IFRS S1/S2 climate disclosure phased in from FY2025-26 for large listed companies
- » SBP Regulatory Framework for Climate-Related Financial Risk (2025), full compliance Jun 2029

• Trading Impact

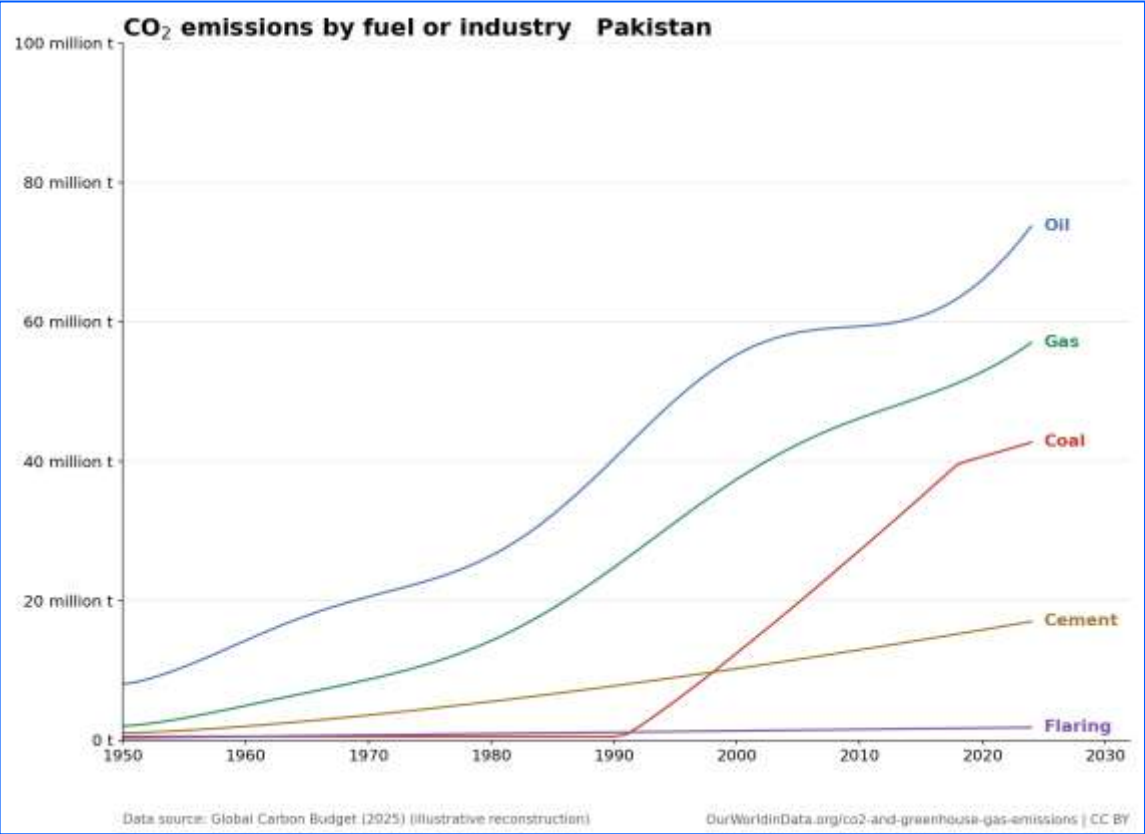
- » EU CBAM currently covers only low % of Pakistan's exports (steel, cement)
- » Textiles — 60% of total exports, ~76% of EU-bound exports — are the real long-run exposure if CBAM expands to textiles (as flagged for ~2027)
- » CSDDD (Omnibus-narrowed) still cascades due diligence expectations through EU buyer contracts and codes

• Government Commitment

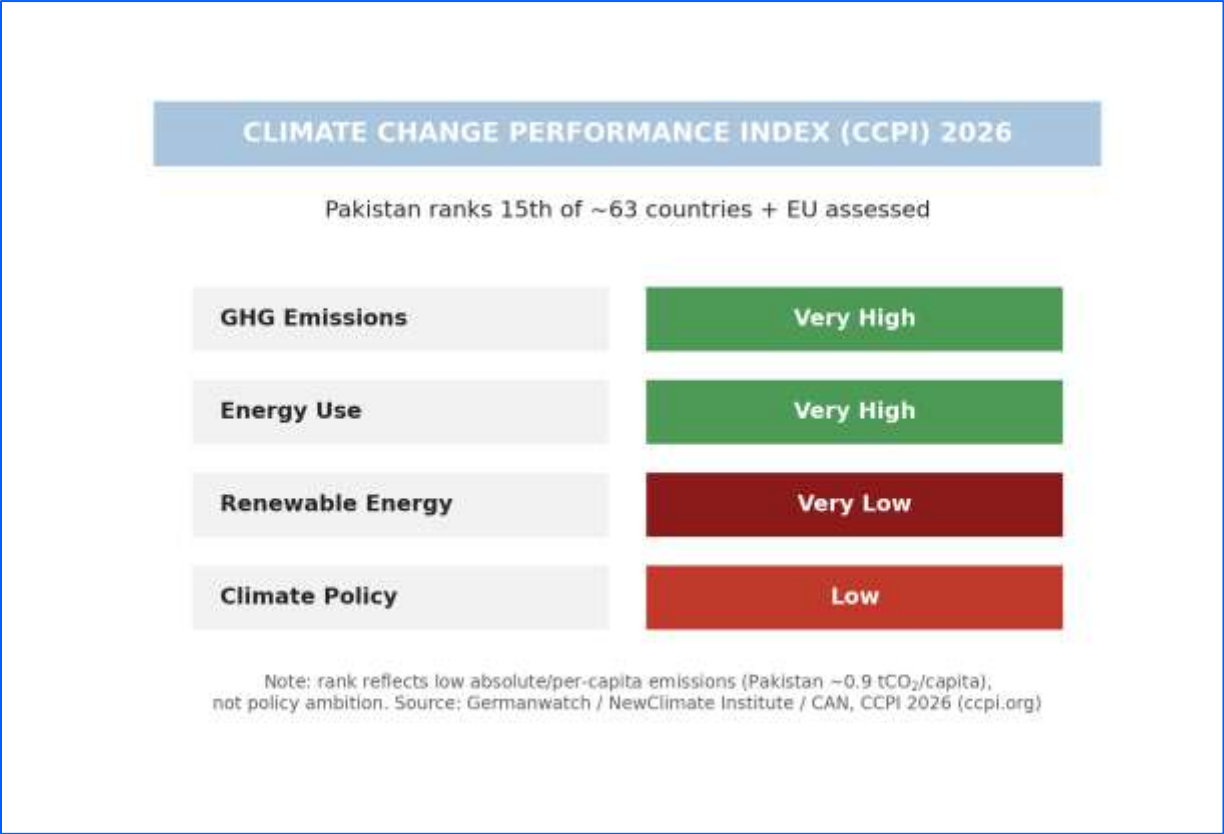
- » SBP Green Banking Guidelines (2017), ESRM Manual (2022) and Pakistan Green Taxonomy underpin the 2025 climate risk framework
- » SECP revised ESG Disclosure Guidelines (Dec 2025) aligned to the Pakistan Green Taxonomy

Pakistan's Emissions Profile & Climate Commitments

Low per-capita emissions (~0.9 tCO₂) despite high climate vulnerability



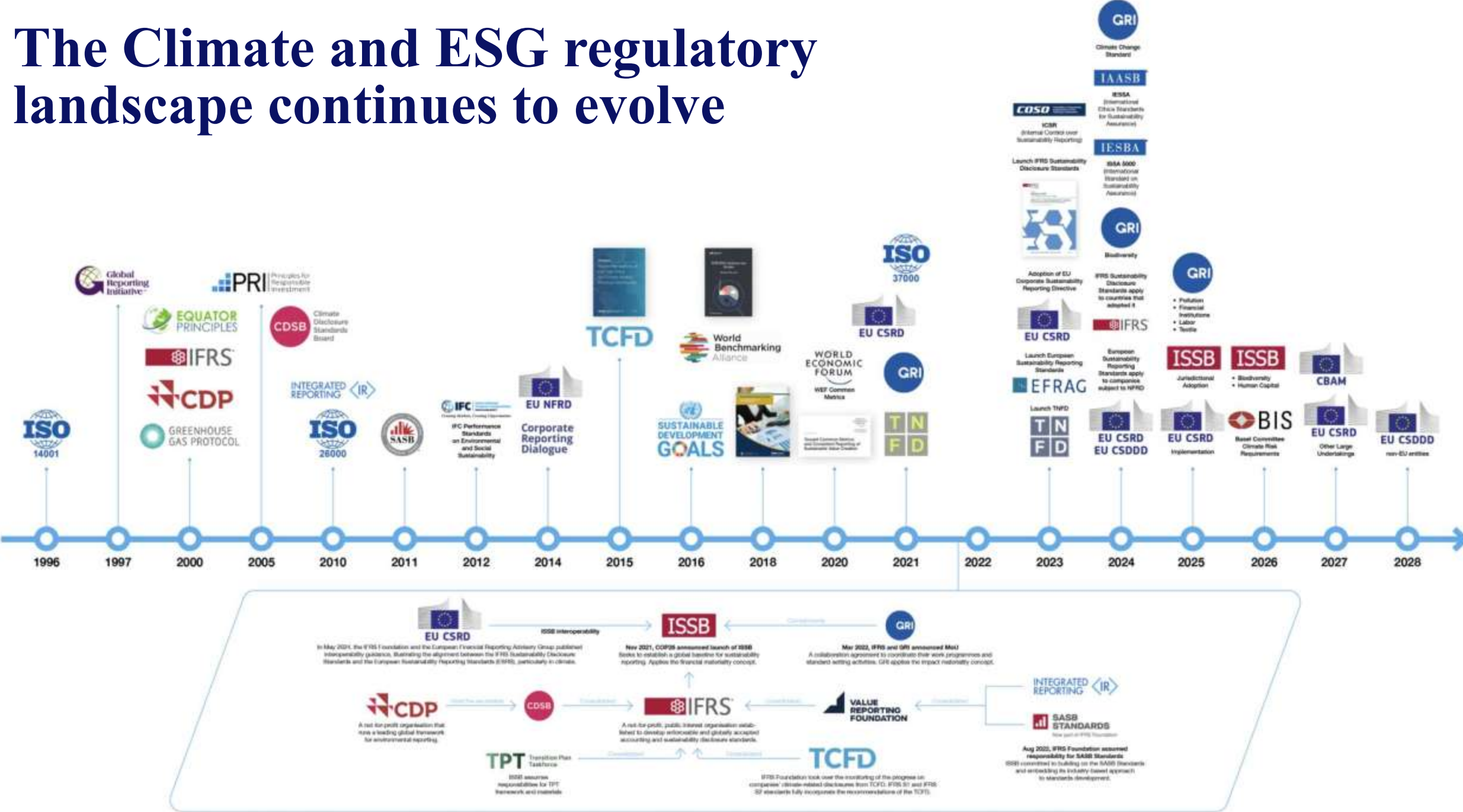
Pakistan ranks 15th of ~63 countries in the CCPI — strong on emissions, weak on climate policy



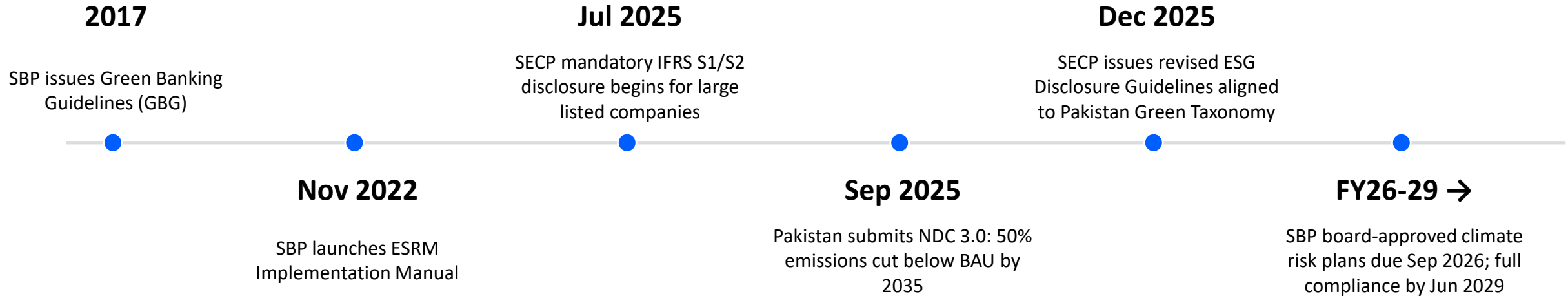


Climate Regulation

The Climate and ESG regulatory landscape continues to evolve



Pakistan's Regulatory Landscape Is Moving Fast



Pakistan now runs two parallel regulatory tracks: SBP governs banks and DFIs on climate-related financial risk, while SECP governs listed corporates on sustainability (IFRS S1/S2 and ESG) reporting and assurance.



Summary of SBP Regulatory Framework

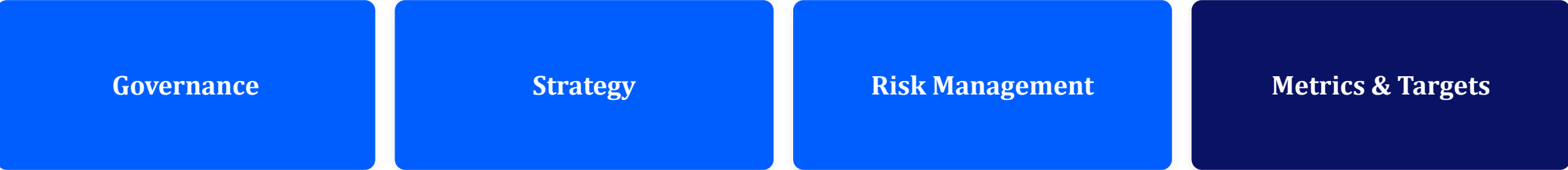
State Bank of Pakistan has released a regulatory framework that sets out an approach for effective management of climate-related financial risks, aligned to international best practices. Banks, DFIs and microfinance banks must submit board-approved implementation plans by September 30, 2026, with full compliance required by June 30, 2029

SBP Regulatory Framework for Climate-Related Financial Risk (2025)

1. Governance and Oversight	Board and Senior Management oversight	4. Risk Management Process	Incorporate climate-related financial risk into overall risk management framework
	Embed roles and responsibilities and capacity building		
	Align strategy and policies to organization		Measure and assess climate impact on credit risk exposures
2. Internal Control Framework	Efficient management across three lines of defense		Measure and assess climate impact on market risk positions
	Conduct climate-related financial risk assessment and monitoring		Measure and assess climate impact on liquidity risk positions
	Ensure climate is managed and addressed at client onboarding and engagement		Measure and assess climate impact on operational risk
3. Capital and Liquidity Adequacy	Incorporate climate-related financial risk into ICAAP and ILAAP	5. Climate Stress Testing	Ensure accurate and timely monitoring and reporting
	Incorporate physical and transition risk into stress testing framework		Conduct Climate Stress Testing considering both physical and transition risk
	Develop appropriate risk metrics in line with risk appetite		Scenarios analysis relates to risk drivers across credit, market, operational and liquidity risk

SBP & SECP: Pakistan’s Two Parallel Tracks

SBP governs banks and DFIs on climate risk via its 2025 Regulatory Framework; SECP governs listed corporates via mandatory IFRS S1/S2.



SBP framework: Governance, Risk Management & Capital/Liquidity | SECP: IFRS S1/S2 phased in from FY2025-26

Regulated Entity	Board-Approved Plan Due	Full Compliance Due
Banks & Development Finance Institutions	September 30, 2026	June 30, 2029
Microfinance Banks	September 30, 2026	June 30, 2029
Framework covers	Governance, risk mgmt., capital/liquidity	Climate stress testing

Why Pakistani banks care

Climate risk becomes part of how banks understand credit, collateral, sector concentration, operational resilience and market/liquidity risk under SBP’s framework, influencing borrower engagement and data requests.

What corporates should expect

Exporters — especially textiles — should expect more granular asks on emissions, transition plans, facility flood exposure, insurance and EU buyer due-diligence data, on top of SECP’s IFRS S1/S2 reporting.

CSDDD: Due Diligence Cascades Down the Value Chain

Corporate Sustainability Due Diligence Directive (CSDDD)



- ❑ Requires large companies to address value-chain harms
- ❑ Scope narrowed to 5,000+ staff, €1.5bn+ turnover, from 2029
- ❑ Assessment now focuses mainly on Tier-1 suppliers

Impact on Suppliers



- ❑ Textile & apparel supply chains (H&M, Inditex, Primark and others) feel this via buyer contracts, not direct regulation
- ❑ Half of B2B buyers already favour sustainable suppliers (Bain)
- ❑ Generalized Scheme of Preferences (GSP) +s 27 conventions reinforce the same due-diligence expectations from a separate angle
- ❑ Exporters with SECP IFRS S1/S2 data can **respond faster to buyer requests**

What is CSDDD?

Large in-scope companies must identify and address human rights and environmental risks through global value chains using a risk-based approach

Which components are considered?

- Supply-chain mapping
- Risk screening of suppliers and sites
- Policies and responsible sourcing controls
- Grievance and incident remediation records
- Evidence pack for buyer audits

Supplier Obligation

Omnibus I (March 2026) narrowed scope but the direct-conduct obligation remains
EU customers can push requirements through contracts, supplier codes, questionnaires, audits, grievance mechanisms and remediation evidence.

CBAM: Textiles Are the Real Exposure

CBAM Carbon Border Adjustment Mechanism



- ❑ Phased approach with focus on high-emitting sectors
- ❑ Companies pay carbon price based on emissions
- ❑ Certificates priced to mirror the EU ETS (confirmed Q1 2026: €75.36/tCO₂)
- ❑ Only 2.5% of embedded emissions need certificates in 2026, ramping to 100% by 2034

Impact on Exporters



- ❑ Only ~1.3% of Pakistan's EU exports are directly exposed today (steel, cement)
- ❑ Textiles are 60% of total exports and ~76% of EU-bound exports — the real risk if CBAM expands to textiles (flagged for ~2027); Worth ~\$6.5-7bn
- ❑ Karachi steel mills and cement makers carry the current direct exposure
- ❑ SME textile exporters are disproportionately exposed once CBAM scope widens

What is CBAM?

CBAM puts a carbon price on embedded emissions in selected imports into the EU. It is designed to align import carbon costs with the EU ETS and reduce carbon leakage

Which Sectors are in scope?

Cement, iron and steel, aluminium, fertilisers, electricity and hydrogen are covered in the initial scope.

Action needed

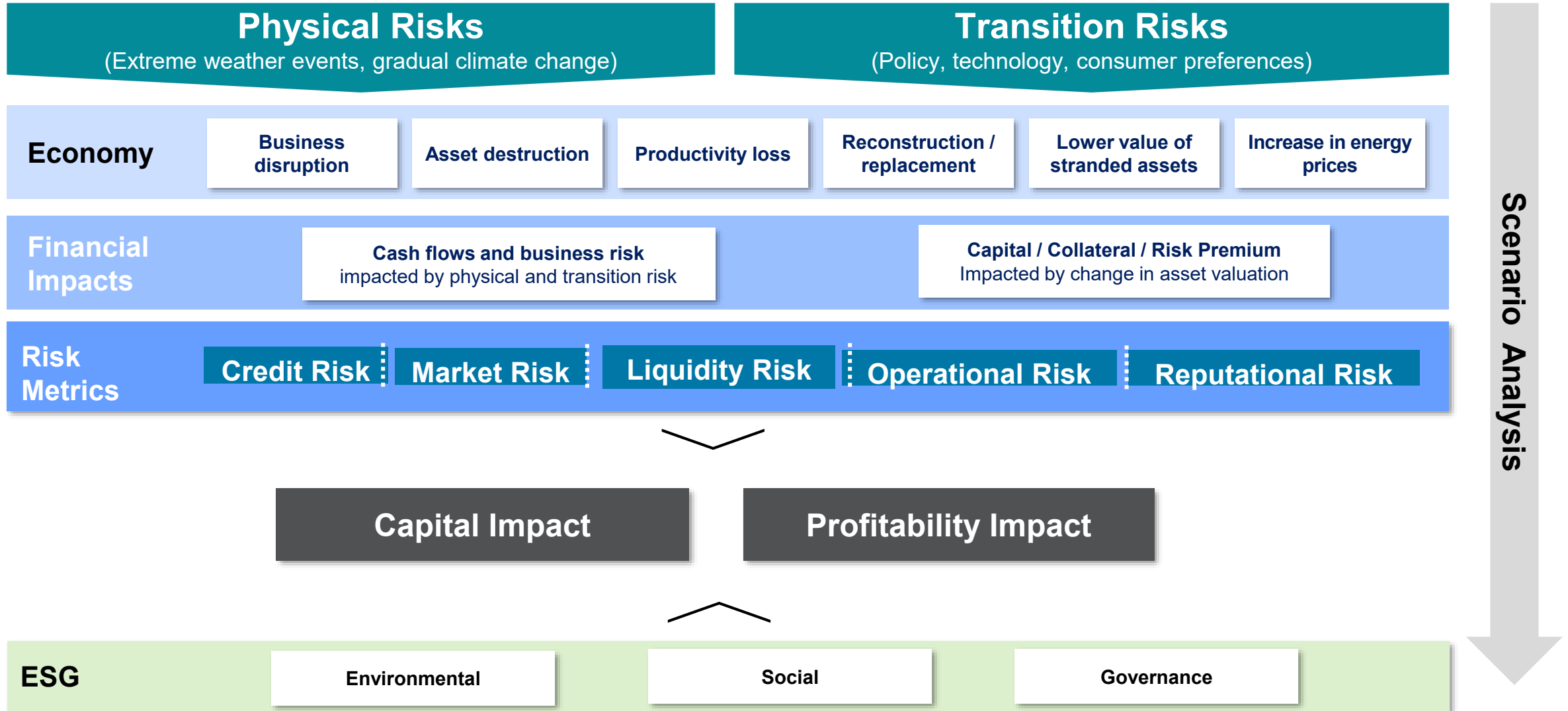
Build product carbon data now — Scope 1, Scope 2, energy-efficiency investment, verification readiness — and track GSP+ conditions, since both determine future EU market access for textiles.



Physical and Transition Impact

Climate Change Transmission Channels

How does Climate Change directly and indirectly through their counterparties, assets, and the economy in which they operate.



Climate Risk in Practice

Physical Risk

1

Agriculture & Agri-Lending

Monsoon dependency and the 2022/2025 floods drive crop-yield volatility, directly affecting rural credit quality and risk for agri-lenders.

2

Real Estate & Infrastructure

Heat and flood exposure raise damage rates and insurance costs for physical assets, especially across Sindh and Punjab flood plains.

3

Manufacturing & Supply Chains

Water stress and extreme heat disrupt operations and logistics in industrial hubs (Karachi, Faisalabad, Sialkot), raising business-interruption risk.

4

Insurance & Reinsurance

Rising flood frequency increases claims volatility in a market where less than 1% of 2022 flood losses were insured.

Transition Risk

1

Power & Energy

A grid still ~50%+ thermal-dependent (LNG, furnace oil, coal) carries circular-debt and stranded-asset risk as solar/hydro scale toward the 60% 2030 target.

2

Cement, Steel & Heavy Industry

Carbon-intensive processes face rising compliance cost as EU CBAM scope potentially expands beyond steel and cement.

3

Textile & Apparel

CBAM, CSDDD-style buyer due diligence and GSP+ conditions raise compliance costs on Pakistan's largest export sector (60% of exports).

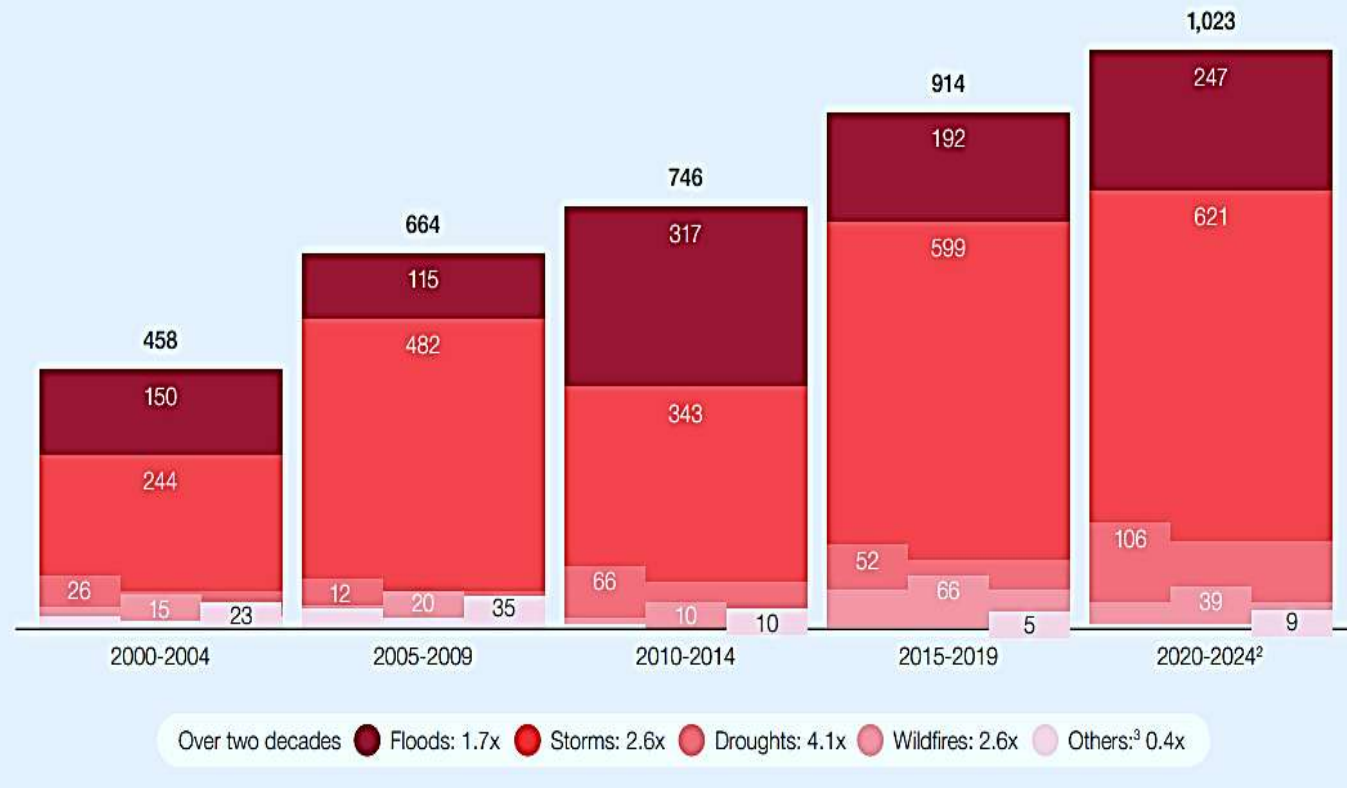
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Financial Institutions

Portfolio realignment toward green, ESRM-compliant finance reprices credit risk under SBP's 2025 climate risk framework.

Economic impact from climate disasters could hit a significant portion of real GDP losses

Economic cost of climate-related disasters¹
(\$ billion) five-year sum of reported cost of disasters from 2000-2024²



Each 1°C increase in global temperature can be linked to a 12% decline in global GDP

-National Bureau of Economic Research (NBER)/ WEF

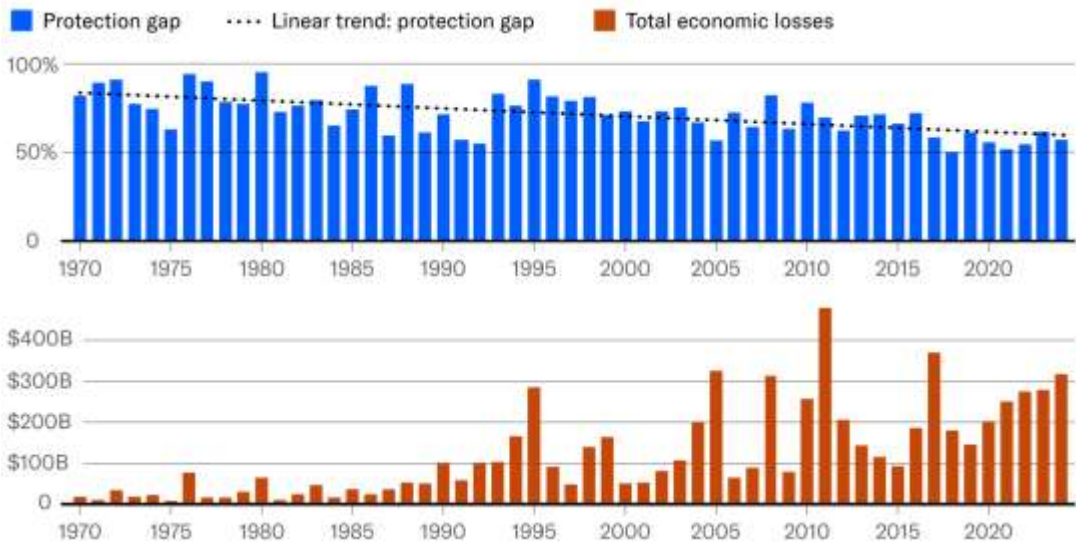
Impact of climate change on economic output might have been underestimated in the past

- NGFS

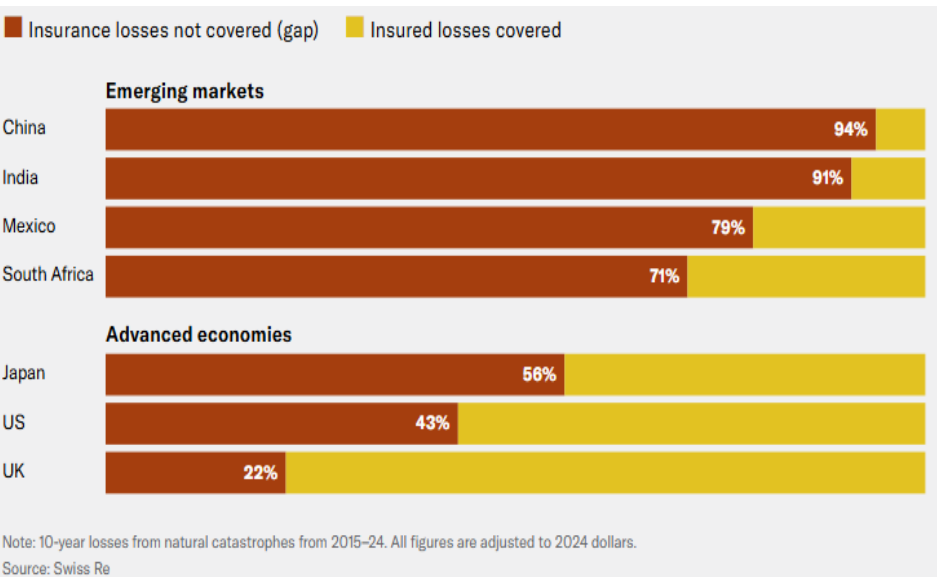
Effects of a warming planet are locked in through mid-century

As climate risks intensify, the most vulnerable countries could fall into a negative spiral whereby the increasing costs of physical climate risks and rising debt constrain adaptation investment, creating a self-reinforcing cycle of exposure and indebtedness.

The insurance protection gap is the shortfall between economic losses caused by an event, and the amount of those losses that is covered and compensated by insurance policies.



10-year losses from natural catastrophes: Protection gap compared to totals covered by insurance



Pakistan’s 2022 floods alone caused **\$USD 30 bn+** in damage — yet less than 1% of affected assets were insured



Building resilience to Climate risk

Transition Risk

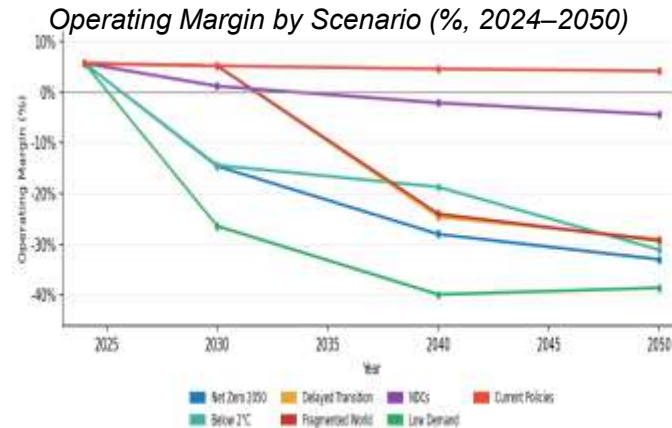
Robust Emissions Data

- **Reported** and **Estimated** Scope 1, 2, 3 data
- **Transparency** in our data by providing the source of collected data, Data Quality Scores aligned to PCAF standards.
- Analyst-assessed emissions data
- Model estimated emissions data



Transition Risk Scenario Modeling

- Compute Impact of Transition Risk on Financial Statements for both direct operations as well as key suppliers.



ILLUSTRATIVE

ESG Scoring

- Uses ESG Ratings framework and simplified inputs (Location, Industry, Size) to indicate baseline ESG Risk.

Indicative ESG scores by MSCI



Supplier Screening

Complete ESG and Climate Risk across the value chain

Multiple data sources can be combined to perform comprehensive analysis for supplier across value chain

	Carbon Emission	Indicative ESG Scores
Metric	Scope 1, 2 and 3	0-10 Score
Coverage	90 Million Companies (Unlimited)	100 Million+ Companies
Description	Comprehensive solutions of acquiring carbon emission and estimation of Scope 1 2 and 3	Uses ESG Ratings framework and simplified inputs (Location, Industry, Size) to indicate baseline ESG Risk.
	Physical Risk Assessment	Custom Reports and Questionnaires
		News And Insights

MOODY'S

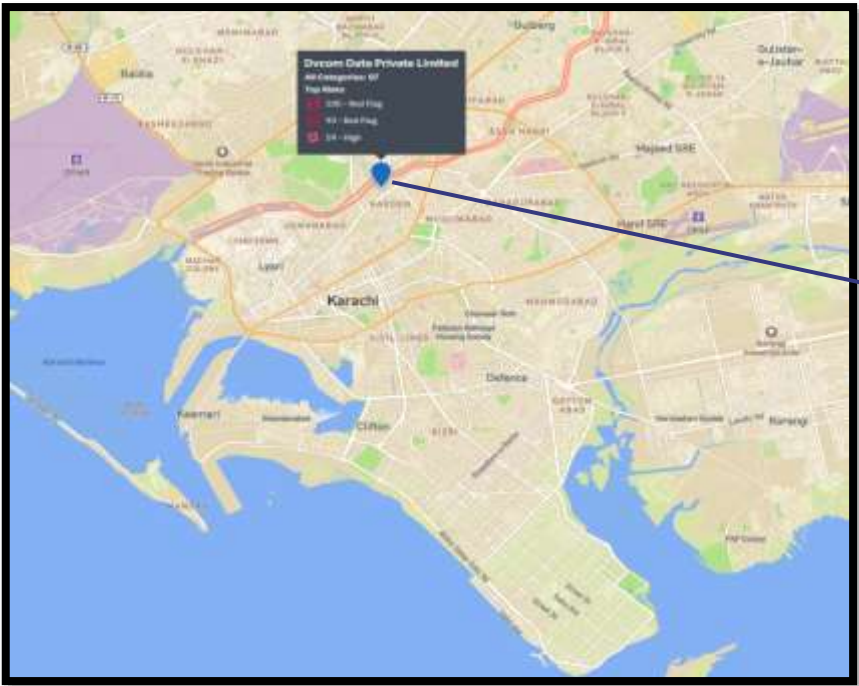
→ Compare with Carbon Emissions

Company Name	GHG - Scope 1 emissions	GHG - Scope 2 emissions	GHG - Estimated Scope 1&2	GHG - Scope 3 emissions	GHG - Estimated Scope 3	Carbon Intensity	Decarbonization Target
Sample Company 1	117,842.94	56,787.17	No	4,379,828.29	Yes	High	Yes
Sample Company 2	976,507.46	27,143.12	Yes	2,587,346.45	Yes	High	No
Sample Company 3	3,489.16	7,664.99	No	157,689.36	Yes	Average	Yes
Sample Company 4	164,395.19	3,338.30	Yes	437,090.59	Yes	High	Yes
Sample Company 5	188,069.98	3,259.75	Yes	485,159.02	Yes	High	No
Sample Company 6	1,572.00	2,975.00	No	128,534.07	Yes	Moderate	No
Sample Company 7	130,793.41	3,484.62	Yes	239,496.55	Yes	High	No

→ Benchmarking on ESG performance

Company Name	Overall ESG score	ESG score industry minimum	ESG score industry maximum	Biodiversity & land use score	Carbon emissions score	Chemical safety score	Health & safety score	Climate change vulnerability score
Sample Company 1	5.1	3.3	7.3	10.0	10.0	7.0	7.9	10.0
Sample Company 2	5.3	3.7	8.4	6.8	7.0	4.6	1.5	8.2
Sample Company 3	6.0	2.1	7.1	8.8	9.6	6.3	9.5	8.2
Sample Company 4	5.1	3.7	8.4	7.0	6.7	4.6	1.4	8.3
Sample Company 5	3.1	3.7	8.4	2.9	3.7	4.5	1.4	8.3
Sample Company 6	4.7	3.0	7.9	8.3	7.7	6.6	7.8	7.2
Sample Company 7	5.1	3.7	8.4	6.4	7.0	4.5	1.3	8.3

Conduct Granular assessment for buildings

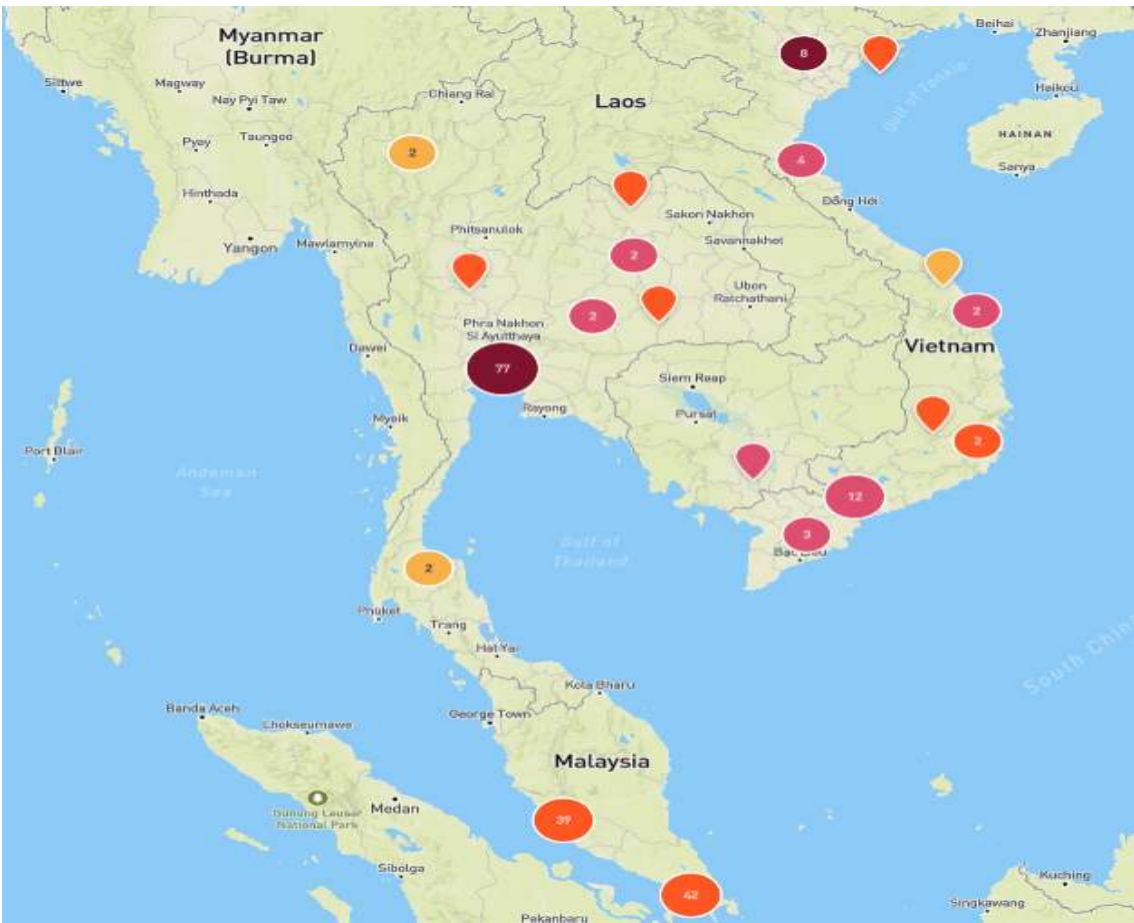


Category	¹ Impact Score	² Annualized Damage Ratio	³ Standard Deviation
Floods	62	0.0000659	0.0021415
Heat Stress	70	0.0001411	0.0002065
Hurricanes & Typhoons	62	0.0000404	0.0023876
Sea Level Rise	0	0.0000000	0.0000000
Water Stress	94	0.0002711	0.0015452
Wildfires	0	0.0000000	0.0000000
Earthquakes	100	0.0012430	0.0382540
All Categories	97	0.0017615	0.0384199

- ¹ **Impact Score:** Combined score accounting ADR and standard deviation - both dimensions of risk
- ² **Annualized Damage Rate (ADR):** Expected damage percentage to an asset in an annual period
- ³ **Standard Deviation:** Measure of the volatility of the ADR

Understanding Physical Risk Impact

Heat Stress Impact Scores; RCP 8.5
2020



Heat Stress Impact Scores; RCP 8.5
2050



Understanding Physical Risk Impact

Heat Stress Impact Scores; RCP 8.5
2020

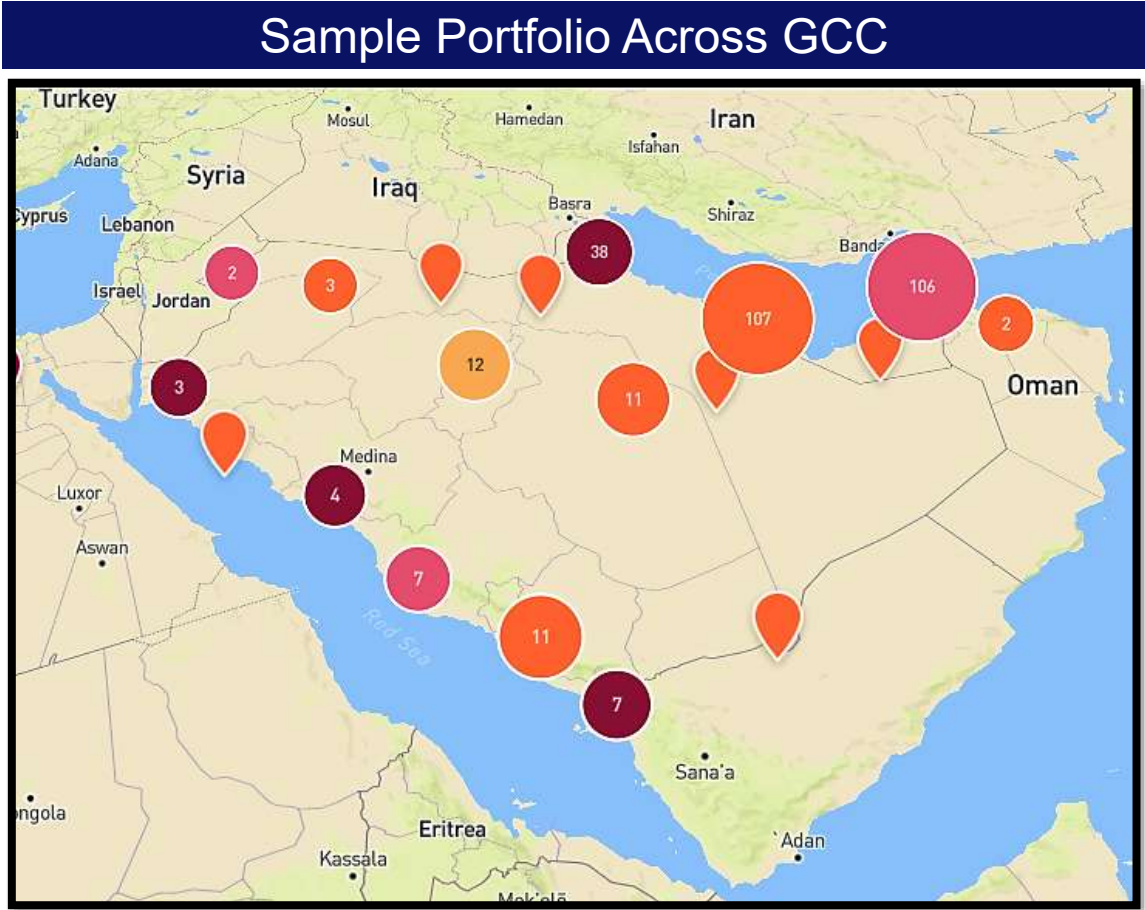
Category	Impact Score	Annualized Damage Ratio	Standard Deviation
 Floods	92	0.0004286	0.0030226
 Heat Stress	67	0.0000991	0.0001107
 Hurricanes & Typhoons	25	0.0000632	0.0003501
 Sea Level Rise	17	0.0000049	0.0000538
 Water Stress	56	0.0000243	0.0000566
 Wildfires	34	0.0000047	0.0001629
 Earthquakes	32	0.0000962	0.0009529
All Categories	59	0.0007210	0.0031956

Heat Stress Impact Scores; RCP 8.5
2050

Impact Score	Annualized Damage Ratio	Standard Deviation
94	0.0004885	0.0033721
89	0.0003496	0.0002747
27	0.0000681	0.0003701
25	0.0000133	0.0000973
68	0.0000361	0.0000761
31	0.0000054	0.0001481
32	0.0000962	0.0009529
67	0.0010572	0.0035396

Across the portfolio, **Expected Annual Damages for Heat Stress will increase by 352%**, per THB

Assess physical risk exposure across portfolio



Impact Assessment

Floods	80	83	85	85	85	85
Heat Stress	63	72	79	84	91	97
Hurricanes & Typhoons	7	7	7	7	8	9
Sea Level Rise	90	92	92	92	93	94
Water Stress	92	92	93	93	93	93
Wildfires	1	1	1	1	1	1
Earthquakes	78	78	78	78	78	78
All Categories	68	73	74	75	77	82

Legend: Red Flag (dark red), High (pink), Medium (orange), Low (yellow), No Risk (green)

Financial Impact

Category	2020	2030	2040	2050	2075	2100
Floods	\$847,472.56	\$950,535.12	\$1,066,874.68	\$1,134,173.59	\$1,210,526.12	\$1,155,626.22
Heat Stress	\$205,563.57	\$312,277.79	\$458,730.00	\$645,158.65	\$1,392,989.96	\$2,765,225.06
Hurricanes & Typhoons	\$4,042.79	\$4,507.31	\$4,759.29	\$5,025.32	\$5,915.87	\$6,595.74
Sea Level Rise	\$1,366,249.50	\$1,846,577.10	\$1,873,430.20	\$1,899,635.00	\$2,101,906.40	\$2,573,103.00
Water Stress	\$154,517.00	\$154,517.00	\$154,517.00	\$154,517.00	\$163,154.30	\$163,154.30
Wildfires	\$6.25	\$6.68	\$6.71	\$6.87	\$7.79	\$9.04
Earthquakes	\$316,029.86	\$316,029.86	\$316,029.86	\$316,029.86	\$316,029.86	\$316,029.86
All Categories	\$2,893,881.53	\$3,584,450.86	\$3,874,347.75	\$4,154,546.28	\$5,190,530.30	\$6,979,743.22

Legend: Red Flag (dark red), High (pink), Medium (orange), Low (yellow), No Risk (green)

ILLUSTRATIVE



Integrating into Lending and Risk Management

Banks can use Credit Impact Scores (CIS) to enhance decision making

No / Lend Decisions

- Based on customer sectors:
 - Prohibited activities
 - DNSH principles
 - Taxonomy classification
- Aligned to bank risk appetite & policies or government guidelines

Consider CIS in Lending Decision

- Assess customer CIS as an additional assessment dimension
- Monitor CIS concentrations and movements

ESG CREDIT IMPACT SCORE*		Internal Rating				
CIS		ORR1	ORR2	ORR3	ORR4	ORR5
CIS-1	Positive					
CIS-2	Neutral-to-low					
CIS-3	Moderately Negative					
CIS-4	Highly Negative					
CIS-5	Very Highly Negative					

	Lend – in line with strategy and bank appetite
	Lend - consider additional review
	Lend – Enhanced covenants, review longer horizon impact and client commitments
	Review – subject to covenants / pricing adjustment subject to Yx impact
	No lend / committee exception approval needed

Impact on Credit

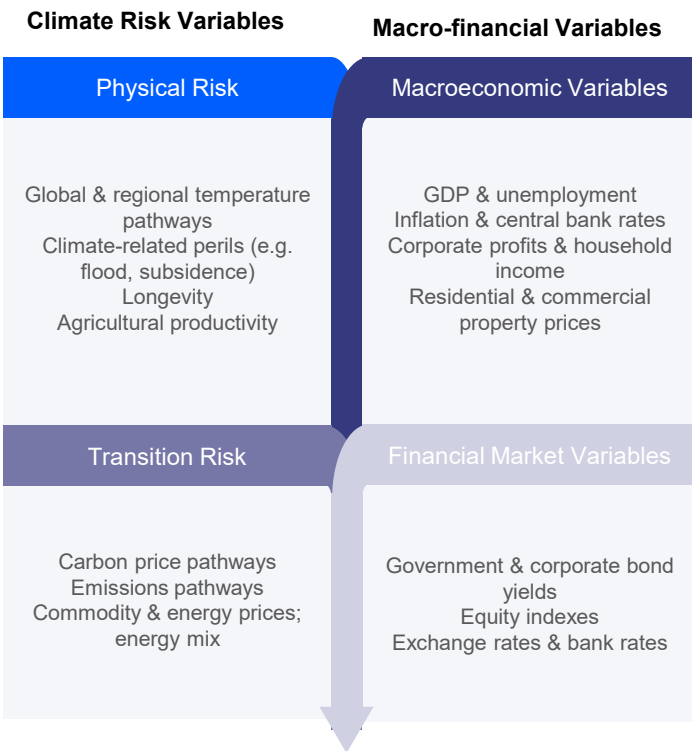
- Adopt CIS adjusted rating and adopt as approved obligor rating
- Banks typically need rating history (and underlying historical data) to ensure appropriate validation in line with MRM policies

Climate Scenarios

NGFS climate scenario narratives

- Orderly
- Net Zero 2050** limits global warming to 1.5 °C through stringent climate policies and innovation, reaching global net zero CO2 emissions around 2050.
 - Below 2 °C** gradually increases the stringency of climate policies, giving a 67% chance of limiting global warming to below 2 °C.
 - Low Demand** assumes that significant behavioral changes – reducing energy demand – in addition to (shadow) carbon price and technology induced efforts, would mitigate pressure on the economic system to reach global net zero CO2 emissions around 2050.
- Disorderly
- Delayed Transition** assumes annual emissions do not decrease until 2030. Strong policies are needed to limit warming to below 2°C. Negative emissions are limited.
- Hot House World
- Nationally Determined Contributions (NDCs)** includes all pledged targets even if not yet backed up by implemented effective policies.
 - Current Policies** assumes that only currently implemented policies are preserved, leading to high physical risks.
- Too little, too late
- Fragmented World** assumes a delayed and divergent climate policy response among countries globally, leading to high physical and transition risks. Countries with net zero targets achieve them only partially (80% of the target), while the other countries follow current policies

Leverage Moody's economic variables

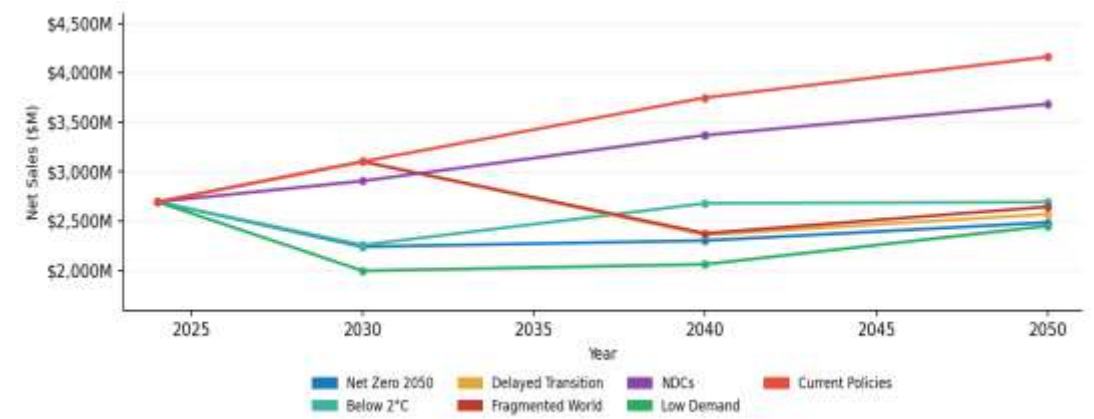


Assess Financial Impact across metrics and risk types

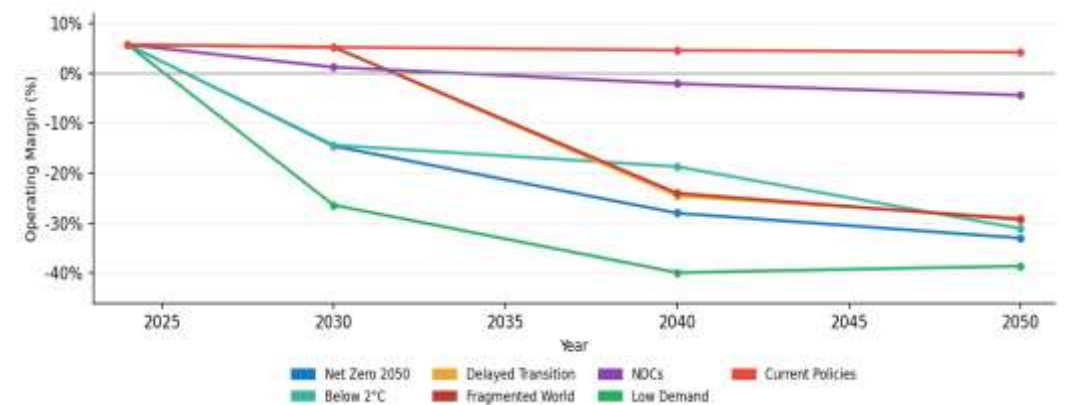


Forecast Climate Adjusted Financials

Metric	Base 2024	2030	2050
Net Sales — Net Zero 2050 (\$M)	\$2,695.7	\$2,242.1 (-17%)	\$2,487.1 (-8%)
Net Sales — Current Policies (\$M)	\$2,695.7	\$3,103.0 (+15%)	\$4,160.7 (+54%)
Operating Margin — Net Zero 2050 (%)	5.7%	-14.6%	-33.0%
Operating Margin — Current Policies (%)	5.7%	5.2%	4.2%
Abatement Cost — Net Zero 2050 (% sales)	—	13.4%	37.3%
Liabilities / Assets — Net Zero 2050 (%)	58.5%	64.9%	217.5%
Adjusted PD — Net Zero 2050 (%)	2.62% / B1	4.73% / B2	15.49% / Caa/C
Adjusted PD — Current Policies (%)	2.62% / B1	2.54% / B1	2.80% / B1
Scope 1 Emissions — Net Zero 2050 (kt)	11,629	4,098 (-65%)	505 (-96%)

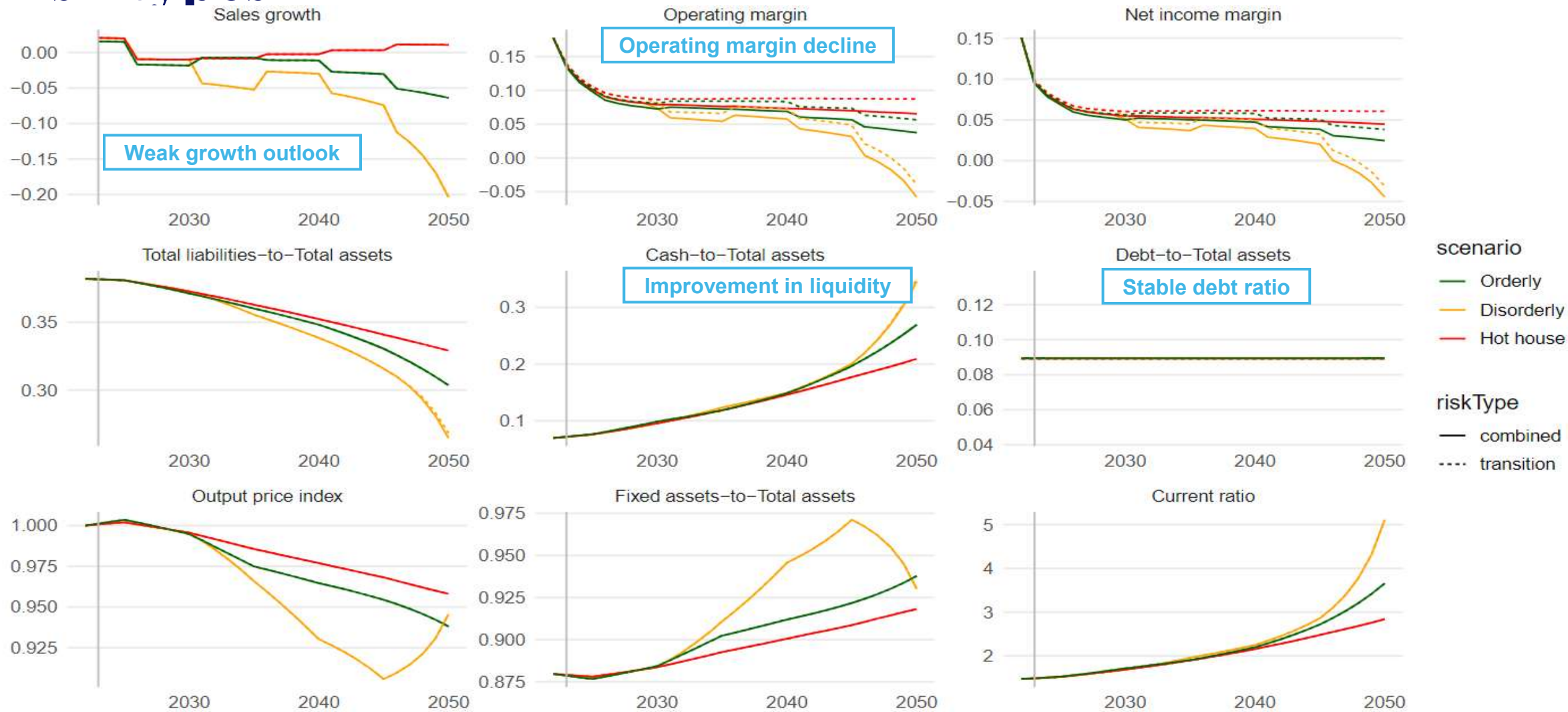


Net Sales Trajectory by Scenario (\$M, 2024–2050)



Operating Margin by Scenario (% , 2024–2050)

Assess Financial Impact across metrics, scenarios and risk types



Key Takeaways



Climate risk is a business risk. Complex regulation, a global challenge — and a real opportunity for early movers



Physical Risk Impact is often **understated** and **underinsured**



Measure impact of **climate** to **reduce future cost of regulation**

- EU-linked trade now carries a real, quantifiable carbon compliance cost



Pakistan's rulebook is **accelerating fast**: SBP and SECP move from voluntary to binding requirements within the next three years.

