Shree Cement

SHREE CEMENT CLIMATE RISK ASSESSMENT REPORT FY 2024-25

Introduction

Shree Cement Limited (SCL), India's third-largest cement manufacturer by capacity, operates with 56.4 MTPA of cement and 1,085 MW of power capacity as of 31st March 2025. Our integrated manufacturing plants are located in Beawar, Ras, Raipur, Kodla, Nawalgarh and Guntur, along with grinding units across ten locations, ensuring broad market reach. These integrated facilities are equipped with captive power and advanced waste heat recovery systems, ranking among one of the largest globally outside of China.

Addressing climate change remains a strategic priority. The cement sector's high energy and emissions intensity places increased importance on transitioning to low-carbon operations. In response to regulatory developments, stakeholder expectations, and climate risks, we are reducing our carbon footprint through energy efficiency, renewable energy adoption, increased use of alternative fuels, and production of low-carbon cement.

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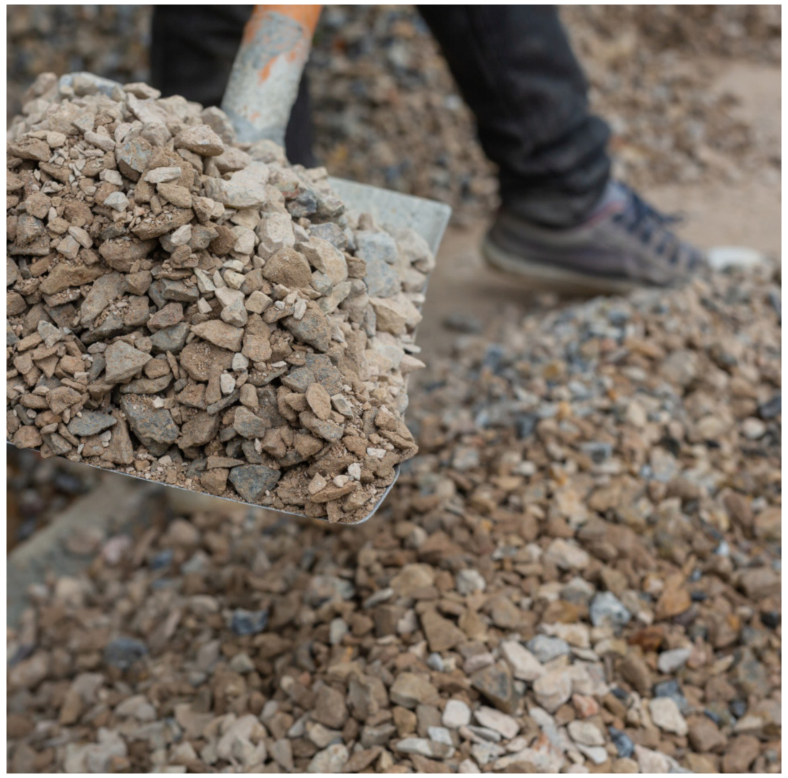
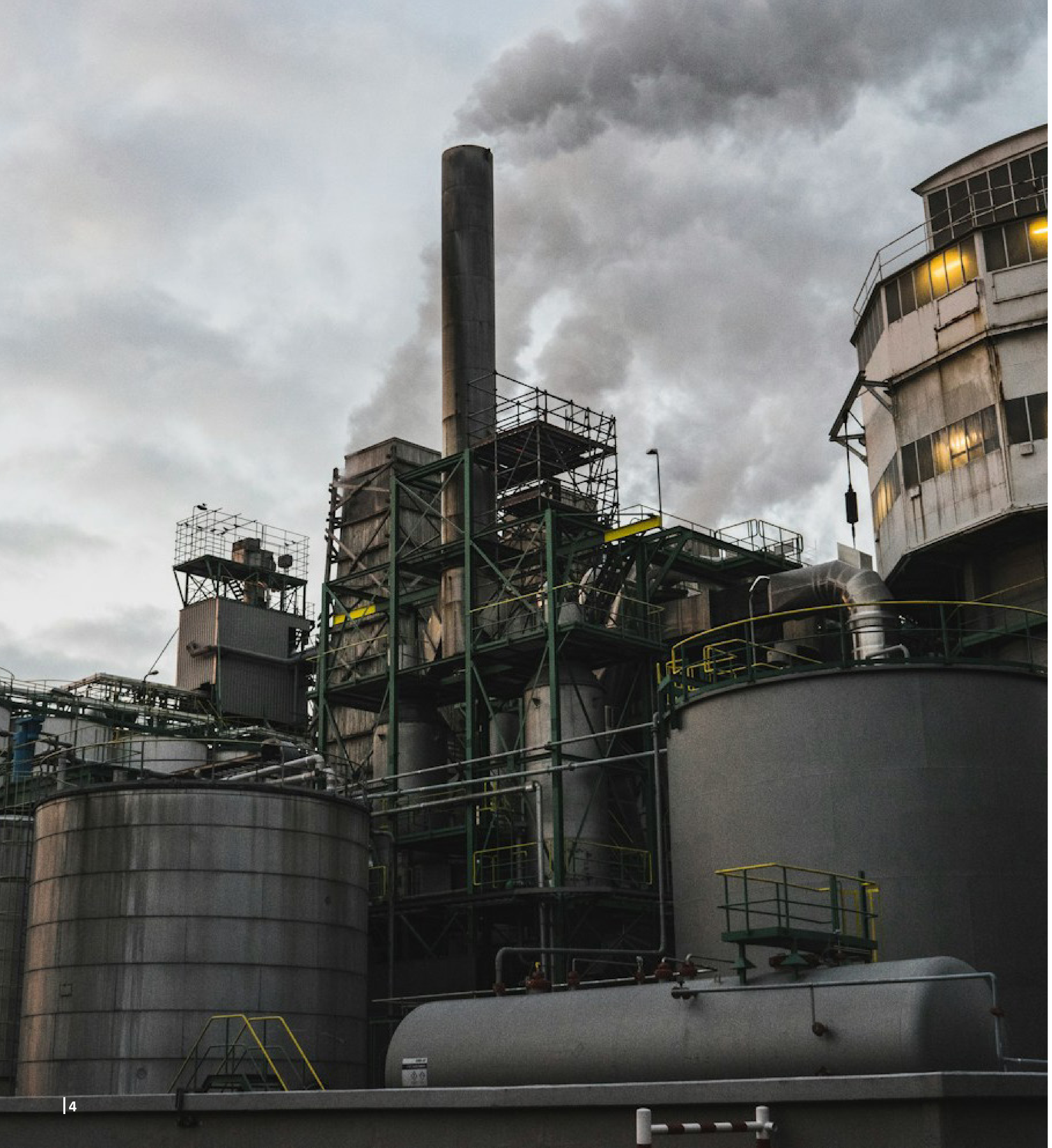


About the Report

This Climate Action Report aligns with our overarching climate strategy and the TCFD framework. It brings together both qualitative and quantitative data from plants and corporate offices, offering clear, comparable insights into climate-related risks, opportunities, and mitigation responses across India.

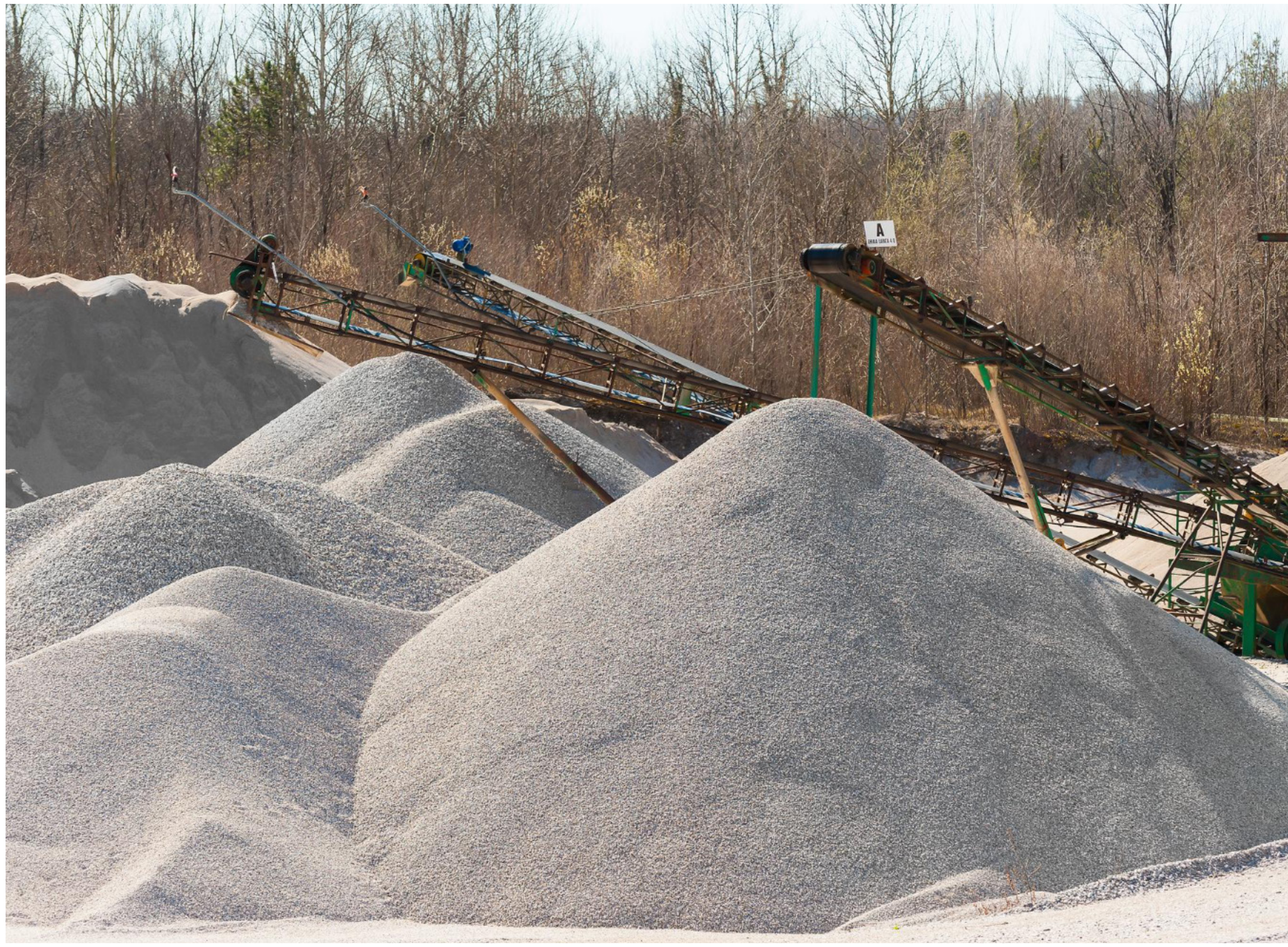


Climate Governance

Shree Cement has implemented a robust climate governance framework that integrates climate-related considerations into strategic, operational, and risk management processes. At the highest level, the Board of Directors sets the strategic direction and assumes ultimate accountability for defining and refining the company's climate objectives and strategy. The Board also reviews major capital investments for new projects and ensures full compliance with regulatory requirements. Climate-related topics are a regular part of Board discussions, reinforcing their role in strategic decision-making.

Supporting the Board are two key committees. The CSR and Sustainability Committee, chaired by the Managing Director, oversees ESG and climate-related initiatives and is responsible for executing the company's sustainability strategy and monitoring performance against key metrics and targets. Accelerating decarbonization remains a strategic priority as Shree Cement works to mitigate climate impacts and achieve its validated Science Based Targets initiative (SBTi) goals. The Risk Management Committee complements this by addressing climate risks within the broader Enterprise Risk Management (ERM) framework. Climate change is recognized as one of the top business risks, and a comprehensive climate risk assessment has led to the development of a physical climate risk adaptation plan covering all operations with long-term mitigation measures.

At the operational level, the ESG Committee, comprising functional heads is responsible for implementing climate strategies, ensuring regulatory compliance, and tracking performance against global benchmarks. The Managing Director plays a pivotal role across all three tiers of governance, ensuring accountability and alignment with Shree Cement's climate-related goals.



Climate Risk Assessment

Climate-related risks and opportunities have been integrated into our Enterprise Risk Management (ERM) framework and financial planning processes. We follow a structured approach to identifying and managing climate-related risks, covering both physical risks such as extreme precipitation, water stress, extreme heat and transition risks arising from regulatory shifts, market changes, technological developments, and reputational factors. This includes exposure to carbon pricing, global regulations CO_2 price exposure, national decarbonization mandates, shifts in consumer preferences, economic growth trajectory, Deployment of renewable and innovative technologies (e.g., CCUS, green hydrogen), energy efficiency imperatives, transition to low-carbon transportation and Stakeholder expectations, and changing customer preferences.

Our assessment methodology incorporates internal reviews, IPCC SSP/RCP scenarios, and industry best practices. Climate data, regulatory trends, and market developments are continuously monitored, followed by scenario-based analysis using specialized tools to evaluate potential business impacts. These insights are integrated into financial planning, including asset valuations, ensuring informed investment decisions and long-term resilience. Risk prioritization is guided by climate modelling, IPCC data, and tools such as WRI Aqueduct, aligned with our strategic time horizons and global reporting standards.

Physical Risk Assessment

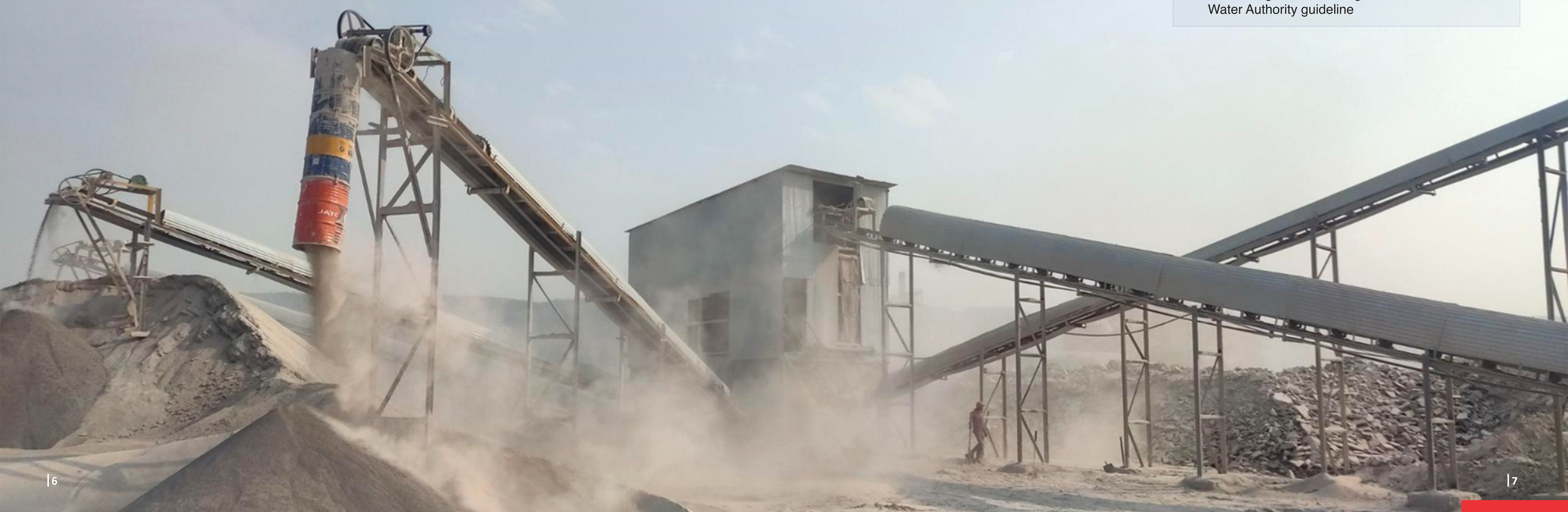
We conducted a comprehensive physical risk assessment across 12 plant locations in India to evaluate exposure to climate-related hazards. This assessment considered both current and future climate scenarios, using location-specific data and historical trends to establish baselines for risks such as water stress, extreme heat, and extreme precipitation. The analysis included baseline conditions and future projections under three climate scenarios, namely SSP1-2.6/RCP2.6 (low emissions), SSP2-4.5/RCP4.5 (moderate emissions), and SSP5-8.5/RCP8.5 (high emissions) for three-time horizons:

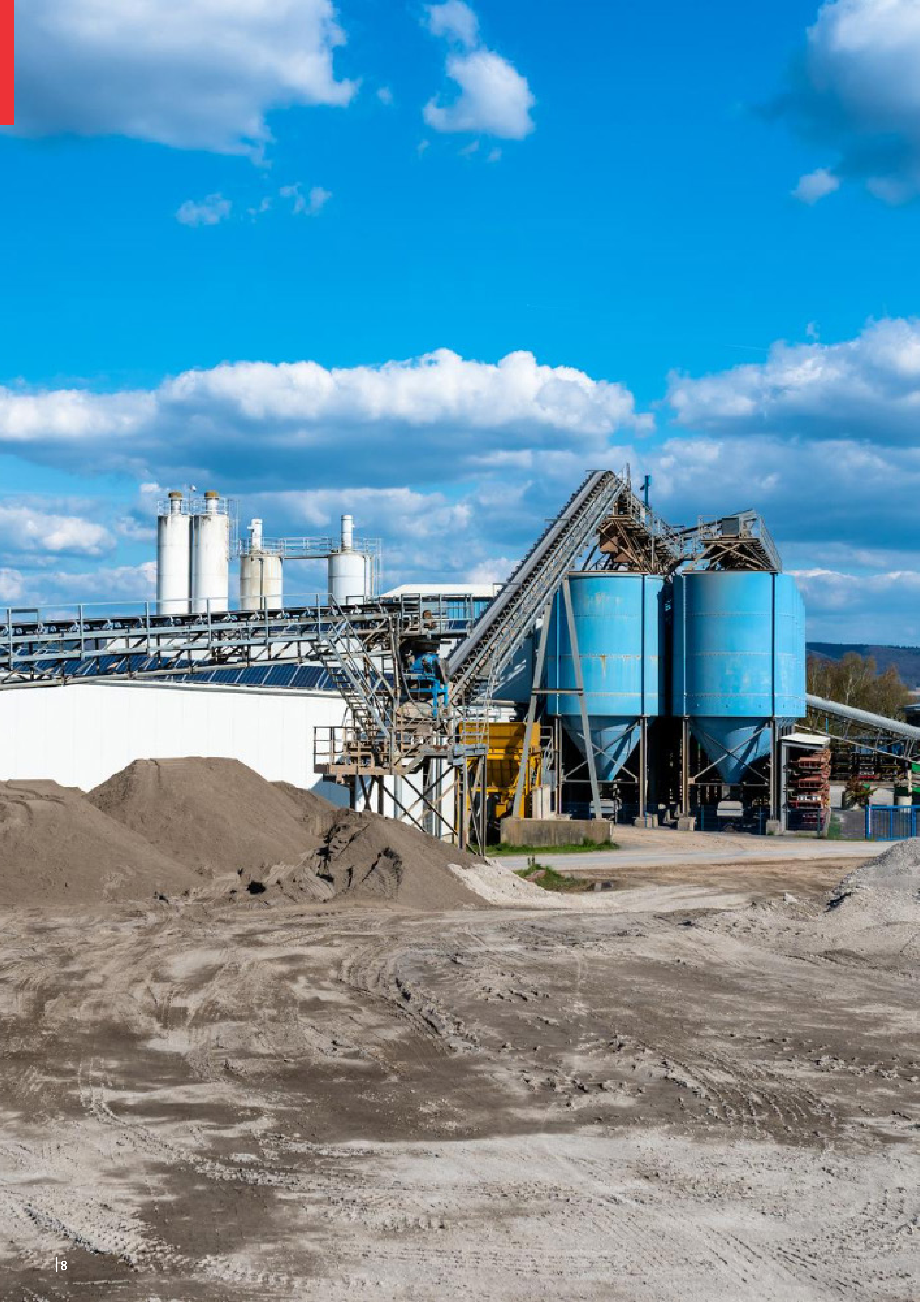
Short-term: 2030
Medium-term: 2050
Long-term: 2100

Physical hazard levels have been quantified using climate models and geospatial tools, enabling us to assess risk severity over time. For each plant, the most vulnerable physical risk is identified, and a corresponding asset value at risk is calculated. These insights inform the development of site-specific mitigation strategies aimed at enhancing climate resilience and safeguarding operational continuity.

Assumptions

- Global CMPI6 based hazard layers has been using which has resolution of 50 km. Therefore, 50 km based hazard layers granularity has been considered.
- Asset valuation of individual plant has been computed based on the units (Integrated unit, Cement grinding unit, Upcoming plant, Thermal power plant, WHR power plant, Wind power plant, Solar power plant) presents in each plant as mentioned in annual reports.
- Asset value at risk has been computed as per the maximum hazard (water stress) for each plant.
- The cost of groundwater withdrawal and alternative water usage has been aligned with Central Ground Water Authority guideline





Climate Hazard Materiality Assessment for Cement Industry

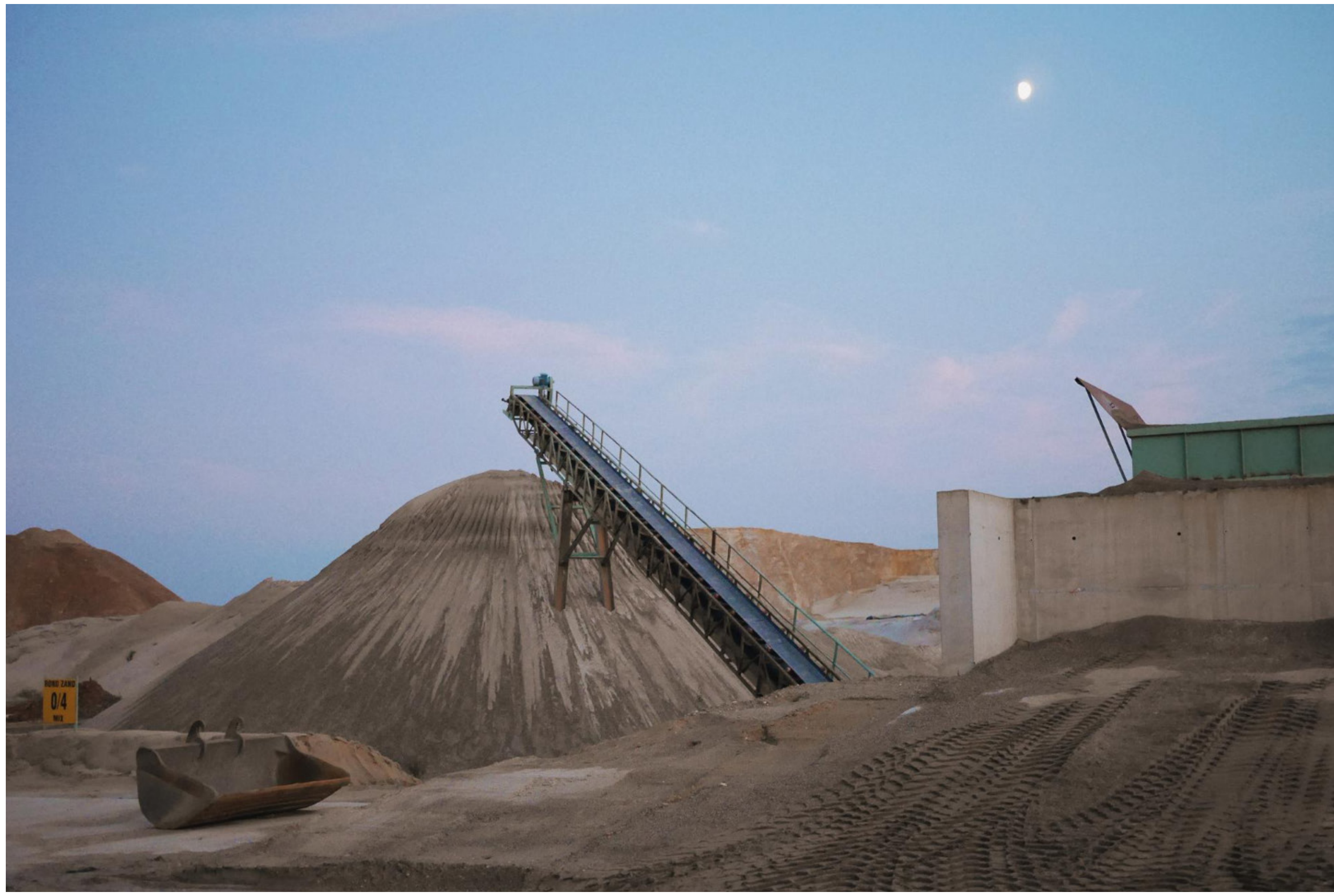
- We consider the identification of physical climate hazards as a critical component of our climate risk management strategy. It is essential for protecting our plant infrastructure, maintaining operational continuity, and complying with evolving disclosure requirements. In the cement sector, physical climate risks such as water stress, extreme heat, and extreme precipitation are particularly material due to the industry's resource-intensive processes and inherent exposure to environmental extremes. The following physical climate hazards were considered for our physical risk assessment:

- Water is majorly consumed by our in-house thermal power generation, dust suppression and utilities. Therefore, scarcity of can lead to reduced production, increased costs for water procurement or treatment, and regulatory or community-related conflicts.

- Extreme heat poses additional risks by reducing equipment efficiency, overloading cooling systems, increasing energy demand, and creating unsafe working conditions that lead to health risks and productivity losses.

- Flooding also represents a significant threat in three forms: coastal flooding (impacting coastal or port-adjacent plants), riverine flooding (affecting inland facilities near rivers or low-lying areas), and urban or flash flooding (due to intense rainfall in poorly drained industrial zones).

These events can damage assets, disrupt supply chains, and interrupt plant operations. Understanding these hazard types and their material implications forms the foundation for site-specific risk mitigation and long-term climate resilience planning.



Plant Specific Physical Risk Assessment of Shree cement

The comprehensive assessment of extreme heat risks across 12 cement plants in India reveals that while current exposure levels remain very low, future projections under various emissions scenarios—SSP1-2.6, SSP2-4.5, and SSP5-8.5—indicate a significant escalation. Currently, all sites exhibit a baseline risk level of Very Low. However, risk levels increase across all scenarios, with projections reaching High to Very High by 2100 under high-emissions pathways.

Extreme heat risk assessment of plants of Shree Cement

SSP1-2.6 / RCP2.6 (Low Emissions Scenario)

- By 2030, risk levels generally increase from from Low to Moderate Risk, indicating Low Risk across all plants.
- By 2050, risk intensifies to Moderate to High Risk, signalling emerging challenges in managing extreme heat.
- By 2100, risk levels range mostly between moderate and high, with some plants in Rajasthan and Maharashtra reaching High Risk levels, necessitating proactive adaptation.

SSP2-4.5 / RCP4.5 (Moderate Emissions Scenario)

- Risk levels rise more sharply compared to SSP1-2.6, with several plants reaching High Risk by 2050.
- By 2100, many plants in Rajasthan, Karnataka, Andhra Pradesh, Bihar, Jharkhand, and Maharashtra are projected to experience Very High Risk.

This scenario indicates substantial physical risks due to increased extreme heat exposure, impacting operations, worker safety, and equipment.

SSP5-8.5 / RCP8.5 (High Emissions Scenario)

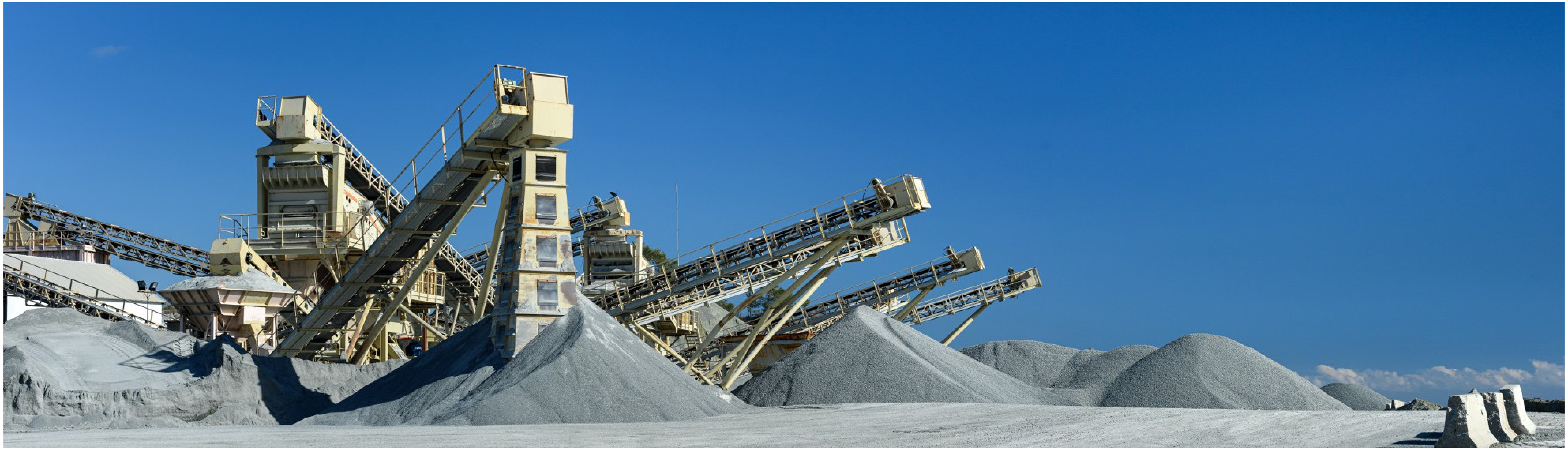
- The most severe risk scenario shows rapid risk escalation.
- By 2030, risk levels already reach low to moderate risk across all plants, escalating to Very High Risk for all plants by 2100.

This scenario highlights the critical need for urgent climate mitigation and robust heat adaptation measures to protect assets and ensure business continuity.

The most impacted locations under future scenarios include:

- Rajasthan: All integrated and grinding units are projected to reach the maximum heat risk score by 2100 across all scenarios.
- Maharashtra: By 2100, risk levels increase significantly, reaching High to Very High under moderate and high emissions scenarios.
- Karnataka and Andhra Pradesh: These lower-latitude locations experience faster increases in heat risk under SSP2-4.5 and SSP5-8.5.
- Bihar and Jharkhand: Plants in these states are projected to face significant risk escalation by 2100, particularly under higher emissions trajectories.
- Chhattisgarh: Also shows a notable increase in extreme heat risk across moderate to high emissions scenarios.

The assessment also reveals that grinding units are equally exposed to rising extreme heat as integrated plants, emphasizing the need for comprehensive heat adaptation strategies across all facilities. These findings reinforce the need for robust mitigation and resilience planning to manage long-term physical climate risks.



Water stress risk assessment of plants of Shree cement

SSP1-2.6 / RCP2.6 (Low Emissions Scenario)

- The baseline risk remains mostly unchanged, from High to Very High Risks for all plants through 2100.

This scenario suggests limited improvement in water stress conditions, indicating ongoing and persistent water challenges.

SSP2-4.5 / RCP4.5 (Moderate Emissions Scenario)

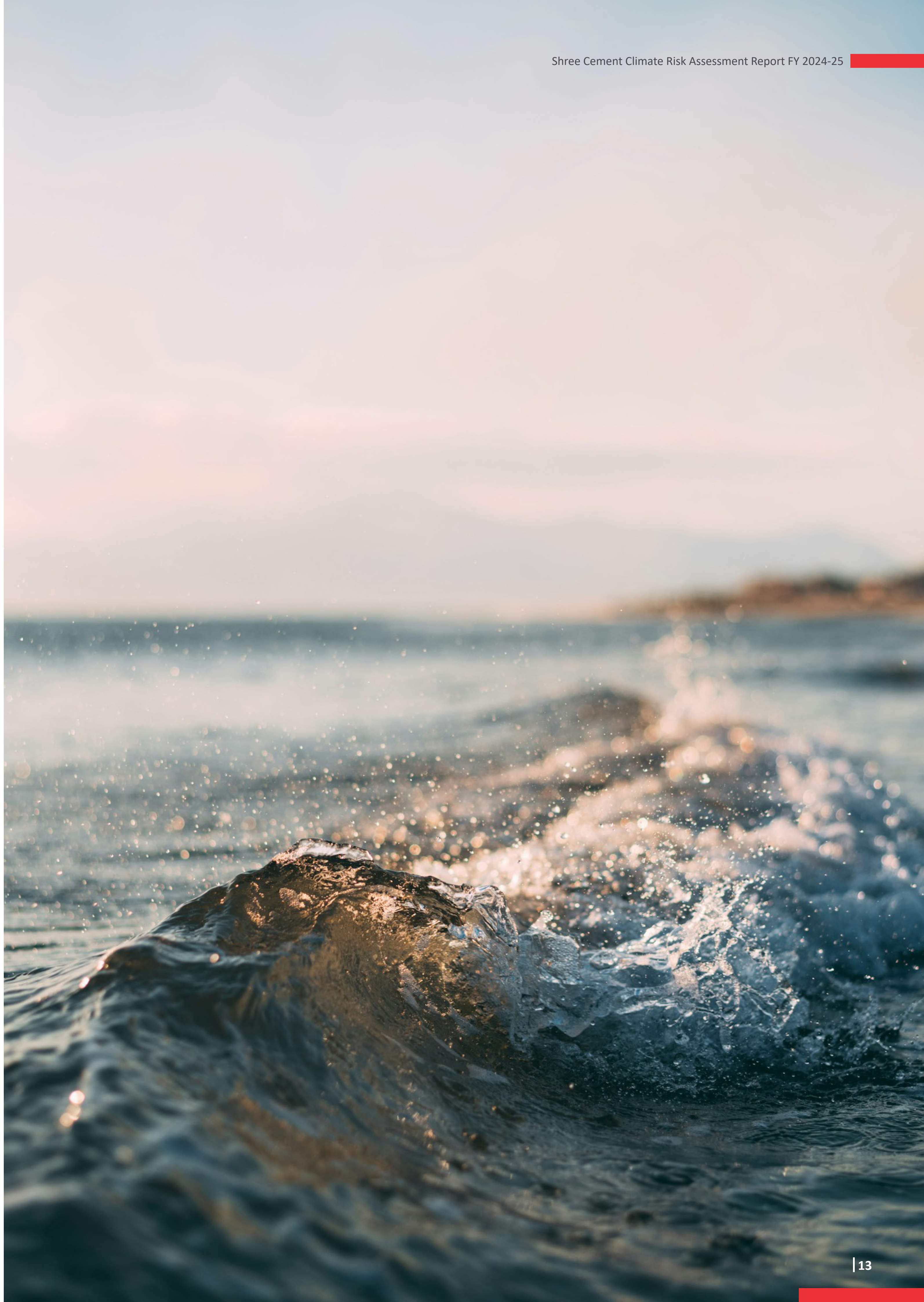
- Most plants continue to experience high water stress, with some variability:
    - The Bihar plant shows a slight reduction to a Moderate Risk in 2030 and 2050 but increases back to high risk by 2100.
    - Other plants maintain High Risk to Very High Risk, indicating that moderate emission pathways will not significantly ease water scarcity concerns.

SSP5-8.5 / RCP8.5 (High Emissions Scenario)

- Under this worst-case scenario, water stress remains at very high levels across almost all plants throughout the century.
- This highlights the critical threat of exacerbated water scarcity due to climate change, necessitating urgent adaptive strategies.

The most impacted locations under future scenarios include:

- Rajasthan: Plants experience the highest levels of water stress, consistent with the region's arid climate and limited water availability. Grinding units in Suratgarh and Khushkhera show sustained very high-water stress risk.
- Uttar Pradesh: The Bulandshahar grinding unit consistently faces very high-water stress across all projections.
- Chhattisgarh: While located in a relatively water-abundant region, the plant still falls within the high-risk category.
- Karnataka: The plant faces slightly lower baseline water stress yet remains classified as high risk in future projections.
- Andhra Pradesh: Despite greater water availability, the plant remains exposed to high water stress in the long term.
- Jharkhand: Baseline risk is lower, but projected stress levels place the plant in the high-risk category.
- Maharashtra: Water stress is currently moderate, but future projections indicate a shift towards high risk.
- Bihar: The grinding unit shows variability in projections, with increased vulnerability expected by 2100.



Urban Flooding Risk Assessment of Shree Cement Plants

SSP1-2.6 / RCP2.6 (Low Emissions Scenario)

- Risk levels largely remain stable across all plants through 2100, with most plants having Low Risk.
- Raipur's risk increases to High Risk by 2100, indicating elevated flood risk even under the most optimistic emission pathway.

SSP2-4.5 / RCP4.5 (Moderate Emissions Scenario)

- Minor increases in risk are projected for some plants:
  - Raipur retains Moderate to High Risk through 2100.
  - Bihar and Jharkhand grinding units show Moderate Risk throughout the projection period.
  - Kodla (Karnataka) and Guntur (Andhra Pradesh) see a slight risk increase to Moderate Risk by 2100.
- The majority of other plants remain at Low Risk, indicating stable but continuous vulnerability.

SSP5-8.5 / RCP8.5 (High Emissions Scenario)

- Risk intensifies slightly under this scenario, with Raipur reaching very high risk by 2100.
- Kodla, Guntur, Bihar, Jharkhand, and Bulandshahar show Moderate Risk by 2100.
- Remaining plants maintain Low Risk, suggesting localized increases in flood exposure rather than widespread escalation.

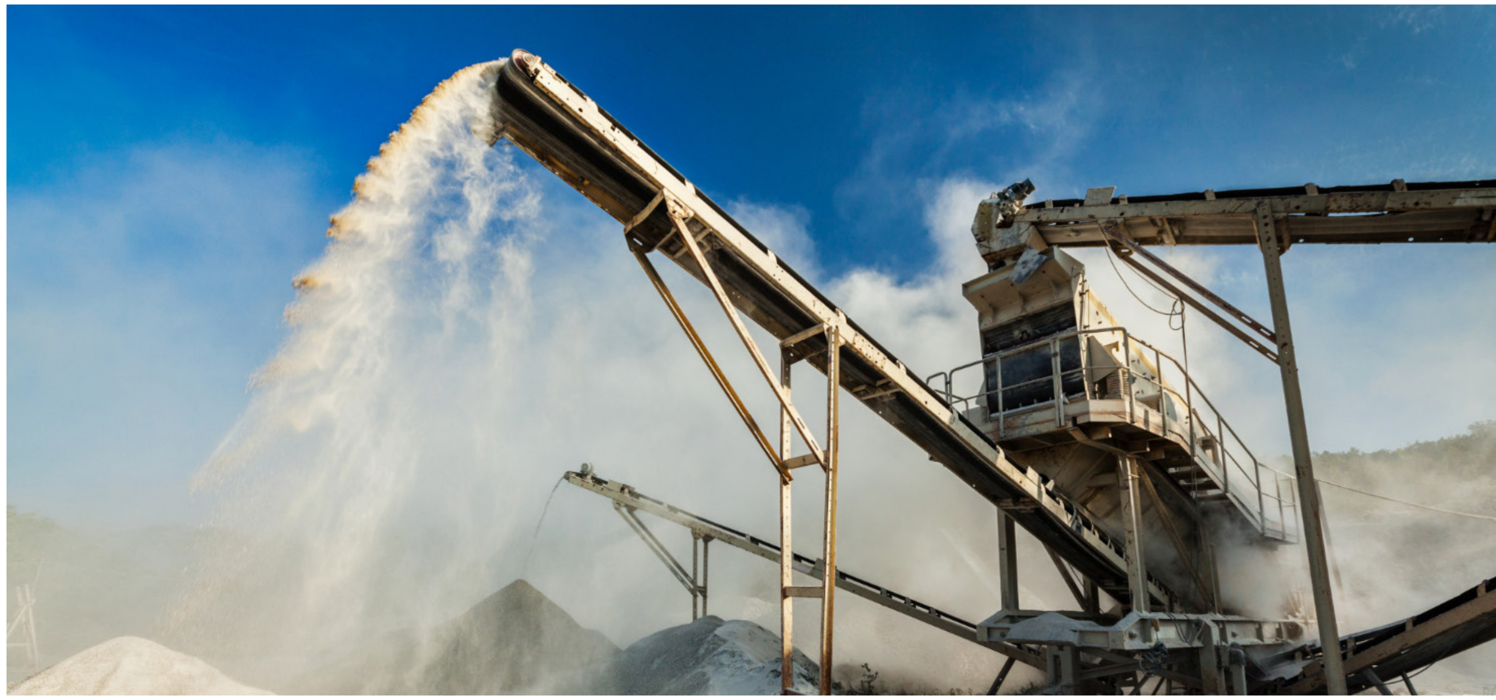
The most impacted locations under future scenarios include:

- Chhattisgarh: The Raipur plant is the most flood-vulnerable location, consistently showing the highest risk across all scenarios and timeframes.
- Karnataka: The Kodla plant demonstrates moderate and increasing flood risk, particularly under high-emission scenarios.
- Andhra Pradesh: The Guntur plant also shows a rising flood risk trajectory, especially in future high-emission projections.
- Bihar: The plant faces moderate flood risk, with potential for escalation under severe climate scenarios.
- Jharkhand: Similar to Bihar, the flood risk is moderate but expected to increase over time.
- Uttar Pradesh: The Bulandshahar grinding unit reflects growing flood vulnerability under intensified emission pathways.
- Rajasthan: Most plants currently face low flood risk, with stable future projections. This is despite high baseline risks for heat and water stress, likely due to favourable topography and resilient infrastructure.

RCP 2.6

Red	Orange	Yellow	Light green	Green
Very High Impact with Very High Likelihood	High Impact with High Likelihood	Moderate Impact with Possible Likelihood	Low impact with Very Unlikely Likelihood	Very Low Impact with Very Unlikely Likelihood

Plant Name	Location	Extreme Heat Risk			Water Stress Risk			Extreme Precipitation Risk		
		SSP1-2.6/RCP2.6 (Below 2°C Scenario)								
		2030	2050	2100	2030	2050	2100	2030	2050	2100
Beawar	Rajasthan	Green	Yellow	Yellow	Red	Red	Red	Green	Green	Green
Ras	Rajasthan	Green	Yellow	Yellow	Red	Red	Red	Green	Green	Green
Nawalgarh	Rajasthan	Green	Yellow	Yellow	Red	Red	Red	Green	Green	Green
Raipur	Chhattis-garh	Green	Yellow	Orange	Orange	Orange	Orange	Yellow	Orange	Yellow
Kodla	Karnataka	Green	Orange	Orange	Orange	Orange	Orange	Green	Green	Green
Guntur	Andra pradesh	Green	Yellow	Yellow	Orange	Orange	Orange	Green	Green	Green
Bihar	Bihar	Green	Yellow	Orange	Red	Red	Yellow	Green	Yellow	Yellow
Jharkhand	Jharkhand	Green	Yellow	Orange	Orange	Orange	Orange	Yellow	Yellow	Yellow
Suratgarh	Rajasthan	Green	Yellow	Yellow	Red	Red	Red	Green	Green	Green
Khushkhera	Rajasthan	Green	Yellow	Orange	Red	Red	Red	Green	Green	Green
Bulandshahar	Uttar Pradesh	Green	Yellow	Orange	Red	Red	Red	Green	Green	Green
Patas	Maharastra	Green	Orange	Orange	Orange	Orange	Orange	Green	Green	Green



RCP 4.5

Plant Name	Location	Extreme Heat Risk			Water Stress Risk			Extreme Precipitation Risk		
		SSP2-4.5/RCP4.5 (Below 2°C Scenario - ~2.0-2.7°C)								
		2030	2050	2100	2030	2050	2100	2030	2050	2100
Beawar	Rajasthan	Green	Yellow	Orange	Red	Red	Red	Green	Green	Green
Ras	Rajasthan	Green	Yellow	Orange	Red	Red	Red	Green	Green	Green
Nawalgarh	Rajasthan	Green	Yellow	Orange	Red	Red	Red	Green	Green	Green
Raipur	Chhattisgarh	Green	Orange	Red	Orange	Orange	Orange	Yellow	Yellow	Yellow
Kodla	Karnataka	Yellow	Orange	Red	Orange	Orange	Orange	Green	Green	Green
Guntur	Andra pradesh	Green	Yellow	Red	Orange	Orange	Orange	Green	Green	Green
Bihar	Bihar	Green	Yellow	Red	Yellow	Red	Red	Green	Yellow	Yellow
Jharkhand	Jharkhand	Green	Orange	Red	Orange	Orange	Orange	Green	Yellow	Yellow
Suratgarh	Rajasthan	Green	Yellow	Orange	Red	Red	Red	Green	Green	Green
Khushkhera	Rajasthan	Green	Yellow	Orange	Red	Red	Red	Green	Green	Green
Bulandshahar	Uttar Pradesh	Green	Yellow	Red	Red	Red	Red	Green	Green	Green
Patas	Maharastra	Yellow	Orange	Red	Orange	Orange	Orange	Green	Green	Green

RCP 4.5

Plant Name	Location	Extreme heat risk			Water stress risk			Extreme precipitation risk		
		SSP5-8.5/RCP8.5 (Far Above 2°C Scenario - > 4°C)								
		2030	2050	2100	2030	2050	2100	2030	2050	2100
Beawar	Rajasthan	Green	Orange	Red	Red	Red	Red	Green	Green	Green
Ras	Rajasthan	Green	Orange	Red	Red	Red	Red	Green	Green	Green
Nawalgarh	Rajasthan	Green	Orange	Red	Red	Red	Red	Green	Green	Green
Raipur	Chhattisgarh	Green	Orange	Red	Orange	Orange	Orange	Yellow	Yellow	Orange
Kodla	Karnataka	Green	Orange	Red	Orange	Orange	Orange	Green	Green	Yellow
Guntur	Andra pradesh	Green	Orange	Red	Orange	Orange	Orange	Green	Green	Yellow
Bihar	Bihar	Green	Orange	Red	Orange	Red	Red	Yellow	Yellow	Yellow
Jharkhand	Jharkhand	Green	Orange	Red	Orange	Orange	Orange	Yellow	Yellow	Yellow
Suratgarh	Rajasthan	Green	Orange	Red	Red	Red	Red	Green	Green	Green
Khushkhera	Rajasthan	Green	Orange	Red	Red	Red	Red	Green	Green	Green
Bulandshahar	Uttar Pradesh	Green	Orange	Red	Red	Red	Red	Green	Green	Yellow
Patas	Maharastra	Green	Orange	Red	Orange	Orange	Orange	Green	Green	Green

Identification of the Most Vulnerable Physical Risk over All Plants

Highest Baseline Risk Across Plants

- Almost all plants already face high to very high-water stress risks at baseline, especially in Rajasthan, Uttar Pradesh, and Bihar.
- This means water scarcity is an immediate and ongoing challenge, unlike extreme heat or flooding, where baseline risks are currently low or moderate.

Persistence Under All Emission Scenarios

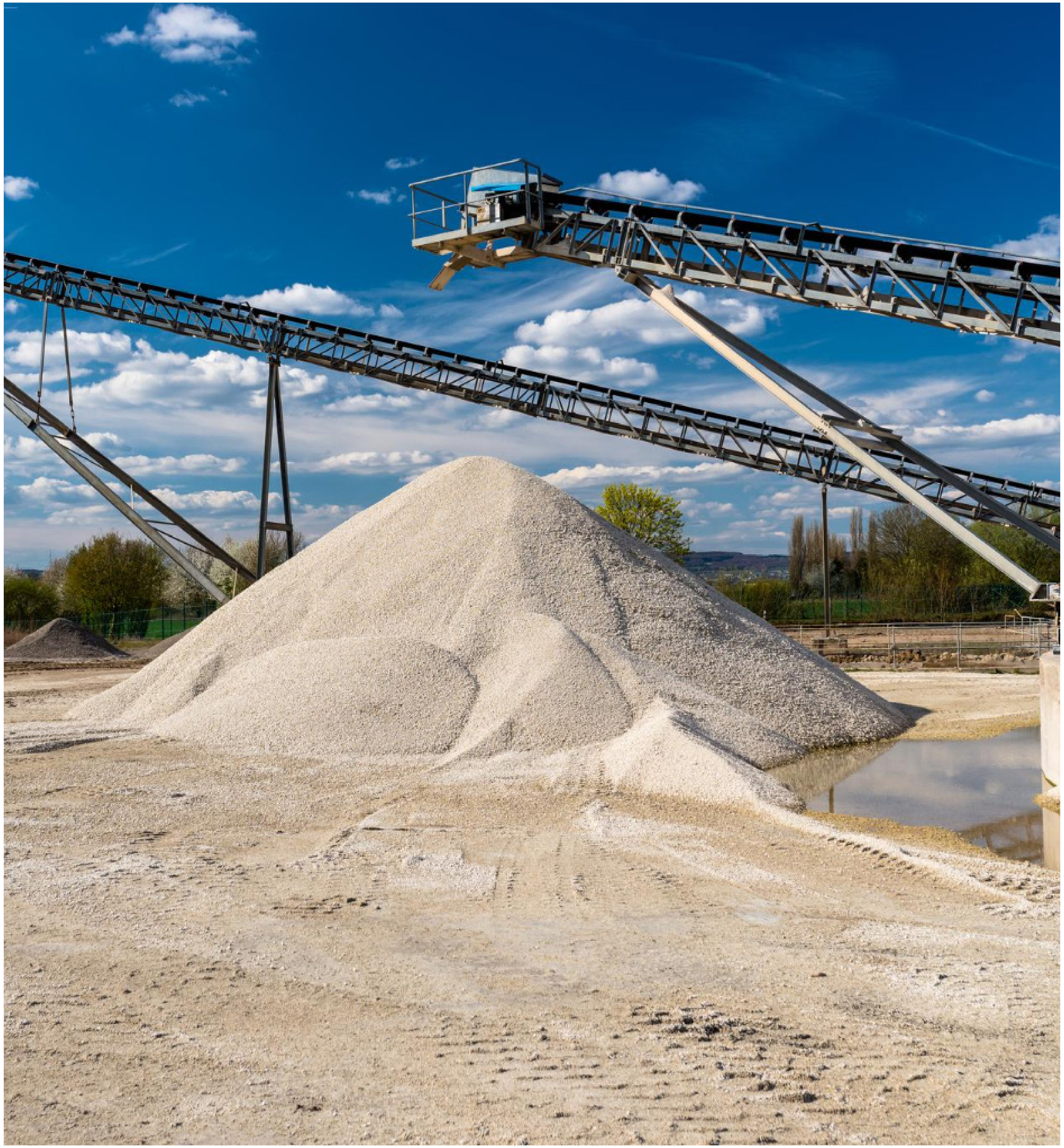
- Projections show no meaningful reduction in water stress even under the lowest emissions scenario (SSP1-2.6).
- Under moderate and high emission pathways, water stress remains high or worsens, indicating a chronic, long-term risk that will not self-resolve without intervention.

Critical Impact on Cement Manufacturing

- Limited water availability directly threatens operational continuity, productivity, and regulatory compliance.
- Water stress affects not just process water but also employee health, community relations, and environmental sustainability.

Geographic Concentration in Arid and Water-Scarce Regions

- Plants in Rajasthan and adjoining states, which constitute a significant portion of Shree Cement's footprint, are in naturally arid zones with limited water resources.
- These regions are highly vulnerable to droughts and water shortages, amplifying the risk.



Mitigation Strategy-Site Wise

● (yellow)	To be Implemented
● (green)	Implemented

Mitigation and adaptation plan for each Integrated and grinding unit for short, medium and long-term time horizons are under as follow:

Short-term (2030)													
Category	**Strategy**	Beawar	Ras	Nawalgarh	Raipur	Kodla	Guntur	Bihar	Jharkhand	Suratgarh	Khushkhera	Bulandshahar	Patas
Adaptation: Water source management	Use treated grey water or municipal wastewater for non-portable uses	Implemented	To be Implemented	Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented
Mitigation: Green certification	Obtain ISO 14046:2014 or WSA Water footprint certification	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented
Mitigation: Pollution control	Install advanced pollution control systems and WHR boilers to replace water intensive gas conditioning towers	Implemented	Implemented	Implemented	Implemented	Implemented	Implemented	NA	NA	NA	NA	NA	NA
Mitigation: raw Materials	Invest in alternative raw materials and clinker substitution to reduce water and energy use	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented
Mitigation: Governance	Develop and enforce comprehensive water management policies aligned with ISO 46001:2019	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented
Mitigation: Technology Investment	Invest in technologies such as CSS and low clinker cement foundation formulations to reduce water and carbon footprint	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented
Mitigation: Innovation	Explore and adopt innovative cement formulations like Solidia cement that reduce water use in curing	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented

Medium-term (2050)													
Category	**Strategy**	Beawar	Ras	Nawalgarh	Raipur	Kodla	Guntur	Bihar	Jharkhand	Suratgarh	Khushkhea	Bulandshahar	Patas
Mitigation: Digitalization	Deploy AI/ML-based predictive models for water demand optimization	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented

Long-term (2100)													
Category	**Strategy**	Beawar	Ras	Nawalgarh	Raipur	Kodla	Guntur	Bihar	Jharkhand	Suratgarh	Khushkhea	Bulandshahar	Patas
Adaptation: Infrastructure Investment	Deploy industrial symbiosis for water sharing with neighboring industries	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented
Mitigation: Carbon-Water Nexus	Implement carbon capture systems with water-efficient cooling	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented
Mitigation: Clinker Substitution	Research and adopt novel low materials like LC3 (Limestone Calcined Clay Cement)	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented
Mitigation: Policy & Governance	Collaborate with regulators on sustainable water pricing and allocation policies	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented	To be Implemented

Transition Risk Assessment

We have conducted a structured transition risk assessment using the International Energy Agency's (IEA) Stated Policies Scenario (STEPS) and Net Zero Emissions by 2050 (NZE) scenario, providing a dual-perspective analysis that captures both moderate and ambitious decarbonization pathways.

The assessment is conducted across three time horizons:

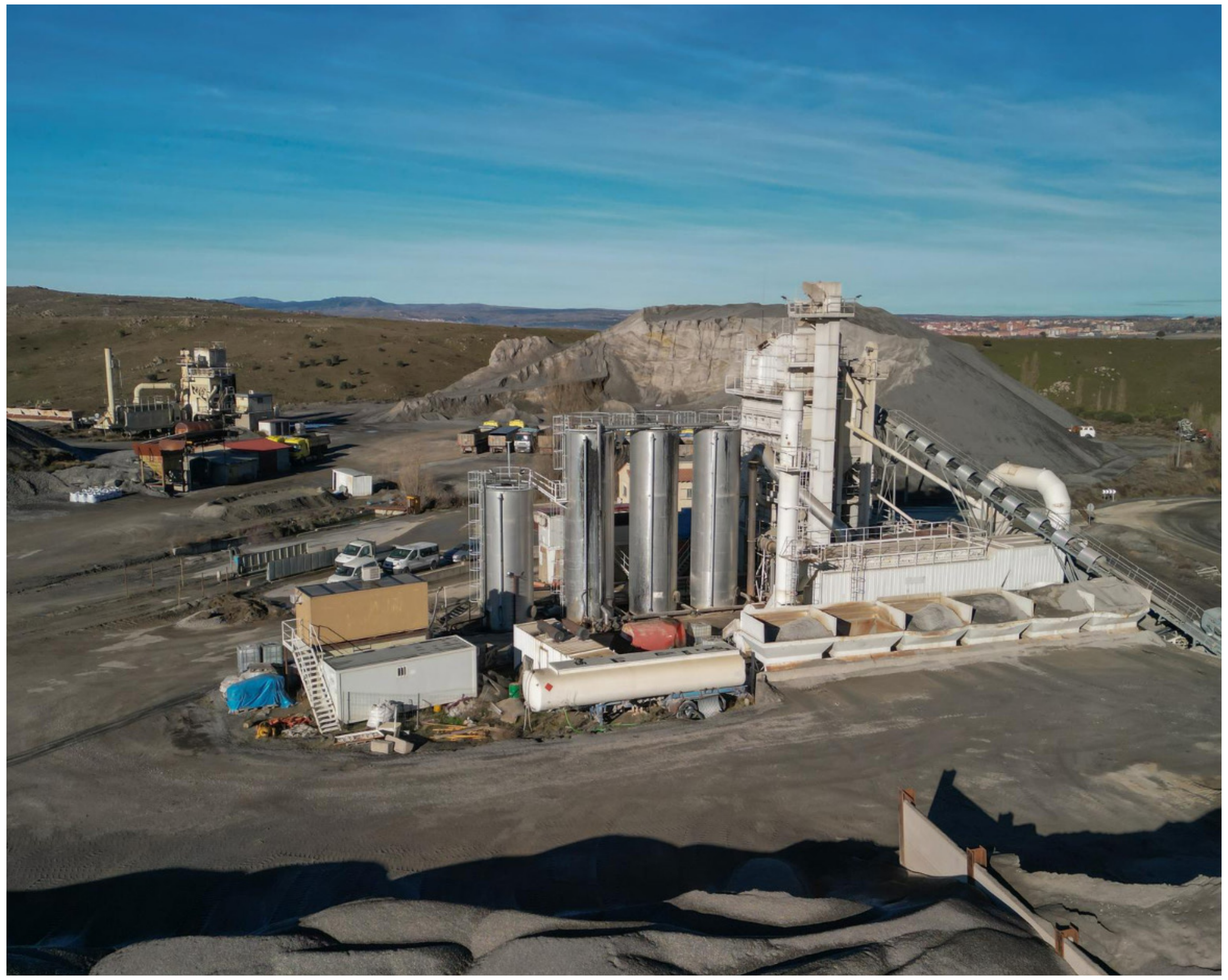
Short-term (2030): Focused on emerging policy impacts, early market signals, and operational readiness.

Medium-term (2040): Emphasizes maturing regulatory landscapes, technology scalability, and shifting stakeholder expectations.

Long-term (2050): Evaluates deep decarbonization implications and structural changes to cement demand and global value chains.

To ensure comprehensive coverage, the analysis used multiple scenario indicators relevant to SCL's direct business, including cement and clinker production volumes, GDP growth, CO_2 price projections, energy mix dynamics, electricity share in transport and total final consumption, and the share of renewable energy.

Aligned with TCFD recommendations, SCL has assessed risks and opportunities across three time horizons—short-term (2030), medium-term (2040), and long-term (2050) to embed climate considerations into strategic decision-making and long-term financial investment planning, in line with SCL's net zero plan.



Opportunity / Risk Score Key						
High Opportunity	Moderate Opportunity	Low Opportunity	Limited	Low Risk	Moderate Risk	High Risk

Category	Transition Risks	Financial Drivers	Impact Level		
			Short-term	Medium-term	Long-term
Policy & Legal	CO_2 Price	Potential annual cost exposure is set to rise due to increasing CO_2 prices and compliance requirements. Under NZE 2050, India's carbon price is projected to reach USD 90/tonne CO_2 by 2030 and USD 200/tonne CO_2 by 2050. As SCL operates in India, this will significantly impact operational expenditure (OPEX).	High Risk	High Risk	High Risk
	National Decarbonization Plans	Increase compliance costs and constrain capital allocation due to accelerated decarbonization timelines	Moderate Risk	High Risk	High Risk
Market	Economic Growth	Accelerated economic expansion and climate-resilient infrastructure development in India are expected to boost cement demand, enhancing SCL's revenue prospects and market positioning.	Limited	Low Opportunity	Low Opportunity
Technology	Deployment of renewable technology	Adoption of renewable technologies enhances cost efficiency, ensures regulatory alignment, and positions Shree Cement for sustained growth in a decarbonizing market	Limited	High Opportunity	Low Opportunity
	Deployment of innovative technologies like CCUS, Green Hydrogen	Early adoption of CCUS and green hydrogen enables SCL to reduce long-term carbon cost exposure, unlock green finance, and access emerging revenue streams from low-carbon markets	Low Opportunity	Moderate Opportunity	Limited
	Energy Efficiency	Failure to implement advanced energy efficiency measures may lead to increased operational costs, higher carbon compliance liabilities, and loss of competitiveness.	Limited	Low Risk	Low Risk
	Low Carbon Transportation	Continued reliance on diesel logistics could lead to increased operational costs, reduced access to green financing, and potential loss of contracts linked to low-emission standards.	Moderate Risk	High Risk	High Risk
Products & Services	Shift in consumer preferences	Preferences toward low-carbon construction materials will require substantial investments in green product innovation and emissions transparency, driving near-term costs but unlocking long-term value through premium pricing, regulatory compliance, market access, and sustained competitiveness	Limited	Limited	Limited

Mitigation Strategy

Risk/ Opportunity	Mitigation Strategy		
	Short-term (2025-2030)	Medium-term (2031-2040)	Long-term (2041-2050)
CO_2 Price: Risk	• Ensure compliance with CCTS targets to avoid purchasing high-cost Carbon Credit Certificates (CCCs). • Expand fuel substitution with biomass and RDF to reduce Scope 1 emissions intensity. • Install advanced Waste Heat Recovery Systems (WHRS) across all units to cut thermal energy use. • Strengthen internal MRV systems for accurate emissions tracking, aligned with MoEFCC and international standards. • Begin lifecycle carbon assessments for cement products to prepare for CBAM reporting and benchmarking. • Initiate R&D partnerships for low-carbon cement and green hydrogen trials. • Engage with trade and policy bodies to shape carbon price regulations and seek transitional incentives.	• Scale up low-clinker cement production, including blended cements with fly ash, slag, and alternative binders. • Invest in green hydrogen infrastructure for high-heat processes in kilns. • Pilot CCUS projects in collaboration with technology and research partners. • Redesign export strategies to favor low-carbon product lines and CBAM-compliant markets. • Implement digital optimization tools and AI-driven energy management systems to reduce operational inefficiencies. • Evaluate Scope 3 logistics emissions and transition to electric or hydrogen-powered fleets.	• Achieve full decoupling of cement production from fossil fuels, powered by renewable energy and green hydrogen. • Deploy large-scale CCUS at major production sites to capture process emissions from calcination. • Launch circular economy platforms to recover materials like recycled concrete aggregates and industrial byproducts. • Reorient business models to include carbon credits trading, low-carbon product certification, and export resilience. • Strengthen ESG-linked financial instruments to secure green bonds or climate-aligned capital at lower cost. • Participate in international carbon markets or Article 6 mechanisms to offset unavoidable emissions.
National Decarbonization Plan: Risk	• Implement targeted energy efficiency upgrades across all plants (e.g., WHRS, VRMs, high-efficiency preheaters). • Increase biomass and RDF co-processing to meet early fossil fuel replacement targets under national schemes. • Ensure full compliance with Perform Achieve Trade (PAT) and Carbon Credit Trading Scheme (CCTS) benchmarks. • Begin internal carbon pricing simulations to assess long-term exposure and embed decarbonization into capital planning. • Establish cross-functional ESG governance to coordinate compliance, reporting, and stakeholder engagement. • Secure green and sustainability-linked financing to fund near-term decarbonization investments.	• Scale deployment of low-clinker cement products using alternative binders (e.g., slag, fly ash, calcined clay). • Accelerate green hydrogen trials and adoption for kiln heat substitution in select units. • Pilot CCUS technologies in collaboration with government programs and technology providers. • Strengthen digitalization and predictive analytics for emissions monitoring, process control, and efficiency optimization. • Develop carbon-neutral product lines for green procurement eligibility in infrastructure and public contracts. • Integrate circular economy strategies (e.g., recycled aggregates, internal waste reuse) to reduce embodied emissions.	• Achieve near-zero emissions by fully electrifying operations using 100% renewable power and green hydrogen. • Deploy full-scale CCUS infrastructure to capture residual process emissions from calcination. • Retool legacy assets or decommission carbon-intensive operations to avoid stranded asset risk. • Embed climate resilience and low-carbon requirements into supply chain contracts and procurement practices. • Continuously adapt to evolving national climate policies, including sectoral transition roadmaps and ESG disclosures.
Shift in Consumer Preference: Risk	• Expand production and marketing of blended and composite cement (e.g., PPC, PSC) with lower carbon intensity. • Integrate AFR (Alternative Fuels and Raw Materials) and WHRS data into environmental product declarations (EPDs). • Develop customer education and B2B engagement programs to promote green cement benefits in public and private construction. • Engage in pilot collaborations with green infrastructure projects to build credibility and capture early market share.	• Scale R&D for low-clinker cement technologies such as Limestone Calcined Clay Cement (LC3), GBFS blends, and alternative binder systems. • Build closed-loop material partnerships with power, steel, and chemical industries to ensure steady input of alternative raw materials. • Digitize emissions tracking and lifecycle assessments for all product categories to meet advanced buyer and regulatory expectations. • Develop green procurement-aligned offerings tailored to urban transport, renewable energy infrastructure, and public housing projects. • Strengthen customer engagement and sales enablement teams on product-level sustainability to gain market preference in low-carbon procurement.	• Phase out legacy clinker-based production systems, retrofitting plants for net-zero technologies (e.g., green hydrogen kilns, CCUS-enabled lines). • Launch net-zero cement lines that comply with both domestic carbon regulations and international CBAM/export standards. • Build net-zero-aligned value chains, including decarbonized logistics, green packaging, and Scope 3 emissions integration. • Decouple growth from volume by monetizing carbon savings (e.g., through voluntary markets, CBAM credits) and investing in low-carbon construction innovation. • Fully align with circular economy models, where cement production is linked to recycled inputs, end-of-life reuse, and zero-waste operations.
Economic Growth: Opportunity	• Expand green cement portfolio by scaling production of PPC, PSC, and other low-carbon alternatives. • Replicate the Alternate Fuel Feeding System across all integrated units to boost thermal substitution and AFR penetration. • Enhance emissions transparency through third-party verified Environmental Product Declarations (EPDs) and digital dashboards. • Integrate AFR and WHR contributions into ESG narratives to strengthen brand value in government and private infrastructure tenders. • Leverage PAT overachievement and WHR expansion to attract ESG-conscious investors and customers. • Target RPO-linked public projects and IGBC/GRIHA-certified green buildings to lock-in long-term demand.	• Scale R&D for low-clinker cement technologies such as Limestone Calcined Clay Cement (LC3), GBFS blends, and alternative binder systems. • Build closed-loop material partnerships with power, steel, and chemical industries to ensure steady input of alternative raw materials. • Digitize emissions tracking and lifecycle assessments for all product categories to meet advanced buyer and regulatory expectations. • Develop green procurement-aligned offerings tailored to urban transport, renewable energy infrastructure, and public housing projects. • Strengthen customer engagement and sales enablement teams on product-level sustainability to gain market preference in low-carbon procurement.	• Phase out legacy clinker-based production systems, retrofitting plants for net-zero technologies (e.g., green hydrogen kilns, CCUS-enabled lines). • Launch net-zero cement lines that comply with both domestic carbon regulations and international CBAM/export standards. • Build net-zero-aligned value chains, including decarbonized logistics, green packaging, and Scope 3 emissions integration. • Decouple growth from volume by monetizing carbon savings (e.g., through voluntary markets, CBAM credits) and investing in low-carbon construction innovation. • Fully align with circular economy models, where cement production is linked to recycled inputs, end-of-life reuse, and zero-waste operations.

Risk/ Opportunity	Mitigation Strategy		
	Short-term (2025-2030)	**Medium-term (2031-2040)**	**Long-term (2041-2050)**
Deployment of Renewable Technologies: Opportunity	• Scale up Waste Heat Recovery Systems (WHRS) capacity across all plants to reduce Scope 1 and 2 emissions. • Expand biofuel and AFR (Alternative Fuels and Raw Materials) usage to meet RPOs and reduce fossil fuel dependency. • Pilot green hydrogen integration in kiln operations in select units under government-supported schemes (e.g., National Green Hydrogen Mission). • Strengthen emissions disclosures and traceability to qualify for ESG-linked financing and public green procurement. • Partner with renewable energy developers for captive solar/wind power purchase agreements to lower grid dependence.	• Integrate hydrogen-fired kiln systems where feasible, enabling cleaner thermal energy substitution. • Digitalize energy use monitoring and optimization systems to improve energy efficiency and emissions performance. • Automate emissions reporting and lifecycle carbon assessments to meet evolving procurement and export standards. • Develop renewable-powered logistics and fleet systems to reduce Scope 3 emissions and strengthen value chain compliance.	• Achieve near complete decarbonization of energy consumption through renewables, WHRS, green hydrogen, and potentially CCUS. • Eliminate fossil fuel use across operations, ensuring eligibility for zero-carbon product markets and avoidance of trade penalties (e.g., CBAM). • Leverage renewable integration as a market differentiator, securing long-term public contracts and premium global export access. • Engage in carbon offset and trading mechanisms using renewable-linked emission reductions to monetize surplus performance. • Position Shree Cement as a net-zero cement producer aligned with India's and global climate goals, driving resilience and shareholder confidence.
Energy Efficiency: Risk	• Expand WHRS capacity beyond the current 242.5 MW to all clinker production units, reinforcing Shree Cement's leadership in thermal energy recovery. • Implement AI-based energy optimization tools across key plants to improve energy intensity and meet PAT targets without penalty risk. • Standardize Alternate Fuel Feeding Systems across all plants to enhance Thermal Substitution Rates and reduce fossil fuel dependency. • Institutionalize energy audits and establish plant-level energy efficiency KPIs linked to performance evaluation. • Accelerate AFR utilization by investing in RDF and biomass processing infrastructure near plants for consistent alternative fuel supply.	• Integrate digital twins and IoT-enabled controls for predictive maintenance and real-time energy management across clinker and grinding operations. • Adopt low-energy grinding technologies (e.g., closed-circuit systems, energy-efficient classifiers) in brownfield and greenfield projects. • Automate emissions and energy data disclosure to improve transparency for ESG-focused investors and regulatory authorities. • Expand partnerships with industrial waste generators to secure long-term alternative raw materials (e.g., fly ash, GGBFS), reducing embodied energy in cement. • Develop internal R&D programs focused on novel fuel-blending techniques and kiln thermal efficiency improvements tailored to Indian conditions	• Transition to fully electrified grinding and handling systems, powered by renewables, in alignment with India's 500 GW clean energy target. • Adopt next-gen kiln designs (e.g., oxy-fuel combustion, electric kilns) and integrate them with carbon capture-ready configurations. • Eliminate fossil fuel usage in operations by shifting entirely to bioenergy, hydrogen, and municipal waste-based fuels. • Benchmark Shree Cement's energy performance globally to access export markets with low embodied energy requirements. • Leverage energy efficiency as a core pillar of net-zero readiness, enabling access to ESG-linked finance, carbon markets, and green construction procurement.
Low Carbon Transportation: Risk	• Building on the initial deployment of electric trucks at its mining sites, Shree Cement will extend pilot programs to cover high-volume logistics routes between grinding units and key distribution hubs. • Retrofit existing diesel-powered utility vehicles and plant-level equipment at major manufacturing facilities with electric conversion kits to accelerate electrification in plant logistics. • Set up EV charging stations at major plants (e.g., Beawar, Ras, Kodla) and regional depots to support in-house and vendor-owned electric trucks, mitigating grid dependency and operational delays. • Engage Transport Vendors: Launch a green transport onboarding program, encouraging third-party logistics (3PL) providers to transition to EVs or CNG fleets through performance-based contract incentives. • Integrate transportation emissions monitoring within Shree Cement's ESG reporting systems to enable visibility on carbon hotspots and prepare for future CBAM or carbon disclosure requirements.	• Begin structured replacement of diesel trucks with electric/hydrogen vehicles across primary delivery routes, especially for dispatch from plants like Panipat, Bulandshahr, and Jobner to urban consumption centers. • Establish clean transport logistics hubs co-located with solar and WHRS-powered plants to offer sustainable vehicle servicing and charging capabilities for fleet partners. • Work with OEMs and technology providers to co-create electric and hydrogen-fueled heavy-duty vehicle prototypes tailored to Shree Cement's operational load and distance requirements. • Explore concessional funding, green bonds, and carbon-linked instruments to offset high capital investment costs related to fleet conversion and charging infrastructure. • Proactively engage in policy consultations under schemes like FAME III and Gati Shakti to align logistics strategies with national clean mobility and infrastructure expansion roadmaps.	• Convert 100% of Shree Cement's logistics—both owned and contracted fleets—to electric and green hydrogen-powered vehicles, ensuring alignment with NZE compliance benchmarks. • Develop certified low-carbon transport systems to meet EU and other international carbon border adjustment mechanisms for cement exports. • Optimize return logistics by transporting industrial by-products such as fly ash, slag, and red mud from client sites back to plants using the same electric/hydrogen trucks—maximizing load utility and emissions efficiency. • Create a real-time digital twin of logistics operations for predictive carbon accounting, efficiency optimization, and transparent carbon reporting to customers and investors. • Partner with government and industry peers to co-develop highway-side EV and hydrogen refueling infrastructure near major cement transport routes.

Targets and Metrics

Commitments	Base Year	Target Year	Performance 2024-25
Reduction of Scope 1 intensity emission (per tonne of cementitious material) by 12.7%	2019 (0.58 Tonne CO_2)	2030 (0.51 Tonne CO_2)	0.534 Tonnes CO_2 / tonne of cementitious material
Reduction of Scope 2 intensity emission (per tonne of cementitious material) by 27.1%	2019 (0.07 Tonne CO_2)	2030 (0.05 Tonne CO_2)	0.012 Tonnes CO_2 / tonne of cementitious material
Achieve 100% electricity consumption within our operations using green electricity.	-	-	56.09 %

GHG Emissions:

In FY 2024–25, our net specific Scope 1 emissions stood at 534 kg CO_2e per tonne of cementitious product.

GHG Parameters	FY 2024-25 (MT CO_2e)W
Scope 1 Emissions	2,13,08,523
Scope 2 Emissions (Location-Based)	4,28,147

Energy:

We have Committed to RE100, a global initiative brining together influential businesses, to shift to 100% renewable electricity by 2050. Highlighting our dedication to reduce carbon footprint and adopting environment friendly practices. We are committed to not adding any new thermal power capacities. Significant investment have been made to expand solar and wind electricity portfolio, with 582 MW solar, Waste Heat Recovery Systems (WHRS), and wind power plant installed across India. Additionally, In line with our sustainability goals, every new kiln will be equipped with WHRS, ensuring future growth is powered sustainably.

Renewable energy capacity as on FY 2024-25:
339.44 MW (Solar + wind)

Energy Parameters	FY 2024-25 (TJ)
Consumption of Renewable Electricity	4,731.96
Consumption of Energy Generated from Agro Waste	1,411.77
Total Renewable Energy consumption	**6,143.73**
Consumption of Conventional Energy	3,702.54
Consumption of Energy Generated from Conventional Fuel	95,428.42
Total Energy Consumption	**1,05,274.69**

Shree Cement

www.shreecement.com