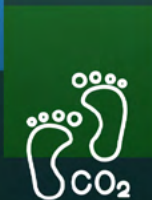


Responsible Today Sustainable Always

Climate Action Report | FY 2025

Aluminium and Power Division, Vedanta Limited





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Abbreviations

Abbreviation	Full Form
BALCO	Bharat Aluminium Company
CapEx	Capital Expenditure
CBAM	Carbon Border Adjustment Mechanism
CCTS	Carbon Credit Trading Scheme
EV	Electric Vehicles
GHG	Greenhouse Gas
ICP	Internal Carbon Pricing
IFRS	International Financial Reporting Standards
INR	Indian Rupee
IPCC	Intergovernmental Panel on Climate Change
LTIP	Long-Term Incentive Plan
MT	Metric Tonnes
MMT	Million Metric Tonnes
NDC	Nationally Determined Contributions
NGFS	Network for Greening the Financial System
NGO / NGOs	Non-Governmental Organization(s)
NOAA	National Oceanic and Atmospheric Administration
OpEx	Operational Expenditure
PPA	Power Purchase Agreement
RCP / RCPs	Representative Concentration Pathway(s)
RE	Renewable Energy
RE-RTC / RTC	Renewable Energy – Round-The-Clock
SSP	Shared Socioeconomic Pathway
TCFD	Task Force on Climate-related Financial Disclosures
tCO ₂ e	Tonnes of Carbon Dioxide Equivalent
WRI	World Resources Institute

About this Report

Vedanta Aluminium (hereafter referred to as ‘we’ and ‘the Aluminium Sector’) is the Aluminium and Power division of Vedanta Limited (hereafter referred to as ‘the Company’), we remain steadfast in our commitment to sustainable development and proactive climate stewardship. This Climate Action Report (hereafter referred to as ‘the Report’) presents an refreshed and comprehensive review of our Climate Action Report 2023, outlining our approach to managing physical and transition risks, reducing emissions, and building long-term resilience amid extreme weather and shifting regulatory dynamics.

Aligned with the IFRS S2 Climate-related disclosures framework—developed by the ISSB under the IFRS Foundation and rooted in TCFD principles, this Report ensures standardized, transparent reporting across governance, strategy, risk management, and performance metrics. By adopting IFRS S2, we enhance consistency, comparability, and relevance in our climate disclosures.

We view this Report as a strategic tool to deepen climate understanding, align with global best practices, and unlock opportunities for resilient growth. Through transparent disclosures, we aim to strengthen stakeholder confidence and reaffirm our commitment to responsible business conduct.



Reporting Boundary

Vedanta Aluminium encompasses 5 sites which include our aluminium smelters located in, Jharsuguda (Odisha) and Korba (Chhattisgarh), alumina refinery situated in Lanjigarh (Odisha), the captive power plants at each of these sites, Jamkhani Coal Mine (Odisha) and Vizag General Cargo Berth Private Limited (VGCB) (Andhra Pradesh).

The assessment evaluates exposure to physical risks such as extreme weather events and temperature fluctuations, alongside transition risks including evolving climate regulations, carbon pricing, and shifts in energy markets. By encompassing these diverse locations, the Report provides a comprehensive view of climate-related vulnerabilities and strategic responses across the company's value chain.

1. Aluminium Smelter, Jharsuguda (Odisha)

1.85 MMTPA	1.83 MMT	3,615 MW
Smelting Capacity	Aluminium metal production in FY 25	Thermal power generation facility

Our facility in Jharsuguda, Odisha is the biggest aluminium smelters globally. It stands out as the sole Indian smelter in the prestigious '1 Million Tonne' production and export category, excelling in producing high-value aluminium products utilized in various important industries.

The facility is also fully equipped with a coal-based Captive Power Plants (CPP), ensuring a consistent and reliable energy supply for operations and also hosts an Independent Power Plant (IPP) that contributes electricity to the respective state power grids.



3. Alumina Refinery, Lanjigarh (Odisha)

4.00 MMTPA	1.97 MMT	170 MW
Capacity	Calcined Alumina Production in FY 25	Thermal power generation facility

Operational since 2007, this refinery has been supplying to our aluminium smelters located in Jharsuguda, Odisha, and BALCO in Chhattisgarh. The alumina refinery is commended for significantly transforming one of the country's most disadvantaged areas, helping integrate it into the socio-economic fabric of Odisha. We aim to expand its capacity to 6 MMTPA by the FY 30, aspiring to become the largest alumina producer globally soon.



4. Mines

2.60 MMTPA	2.08 MMT
Jamkhani Coal Mine Capacity	Coal Mined in FY 25

We have successfully operationalized the Jamkhani Coal Mine which boasts a capacity of 2.6 MMTPA.



2. BALCO, Korba (Chhattisgarh)

0.60 MMTPA	0.58 MMT	1,740 MW
Smelting Capacity	Aluminium metal production in FY 25	Thermal power generation facility

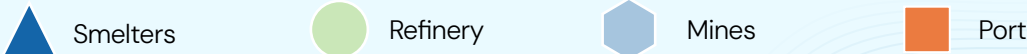
Our Bharat Aluminium Company (BALCO) facility in Korba, Chhattisgarh is a state-of-the-art aluminium manufacturing plant. The plant is co-owned by Government of India and Vedanta Limited in 49:51 ratio. While the plant capacity is significantly smaller than Jharsuguda, we have plans to expand the capacity to 1.085 MMTPA in the coming years.

The facility is also fully equipped with a coal-based Captive Power Plants (CPP), ensuring a consistent and reliable energy supply for operations and also hosts an Independent Power Plant (IPP) that contributes electricity to the respective state power grids.



5. Vizag General Cargo Berth Private Limited (VGCB)

VGCB is a port terminal operated by Vedanta Limited, located at the outer harbour of Visakhapatnam Port. Developed under a 30-year concession agreement on a Design, Build, Finance, Operate, and Transfer (DBFOT) basis, VGCB is a critical logistics hub for bulk cargo, including bauxite, alumina, and other raw materials essential to our operations. The terminal has been extensively modernized to support multi-cargo handling and reduce environmental impact through mechanized systems.



Message From Chairman



Anil Agarwal

Chairman
Vedanta Group

“

We are a future-ready business—resilient, inclusive, and driven by innovation. With sustainability at our core, we will continue to create lasting value for the environment, communities and the nation.

In today's world, a successful business is not defined by profit alone but by its larger purpose, particularly by its contribution towards building a sustainable and climate resilient future. At Vedanta Aluminium, we are fully committed to being a steward of environmental transformation.

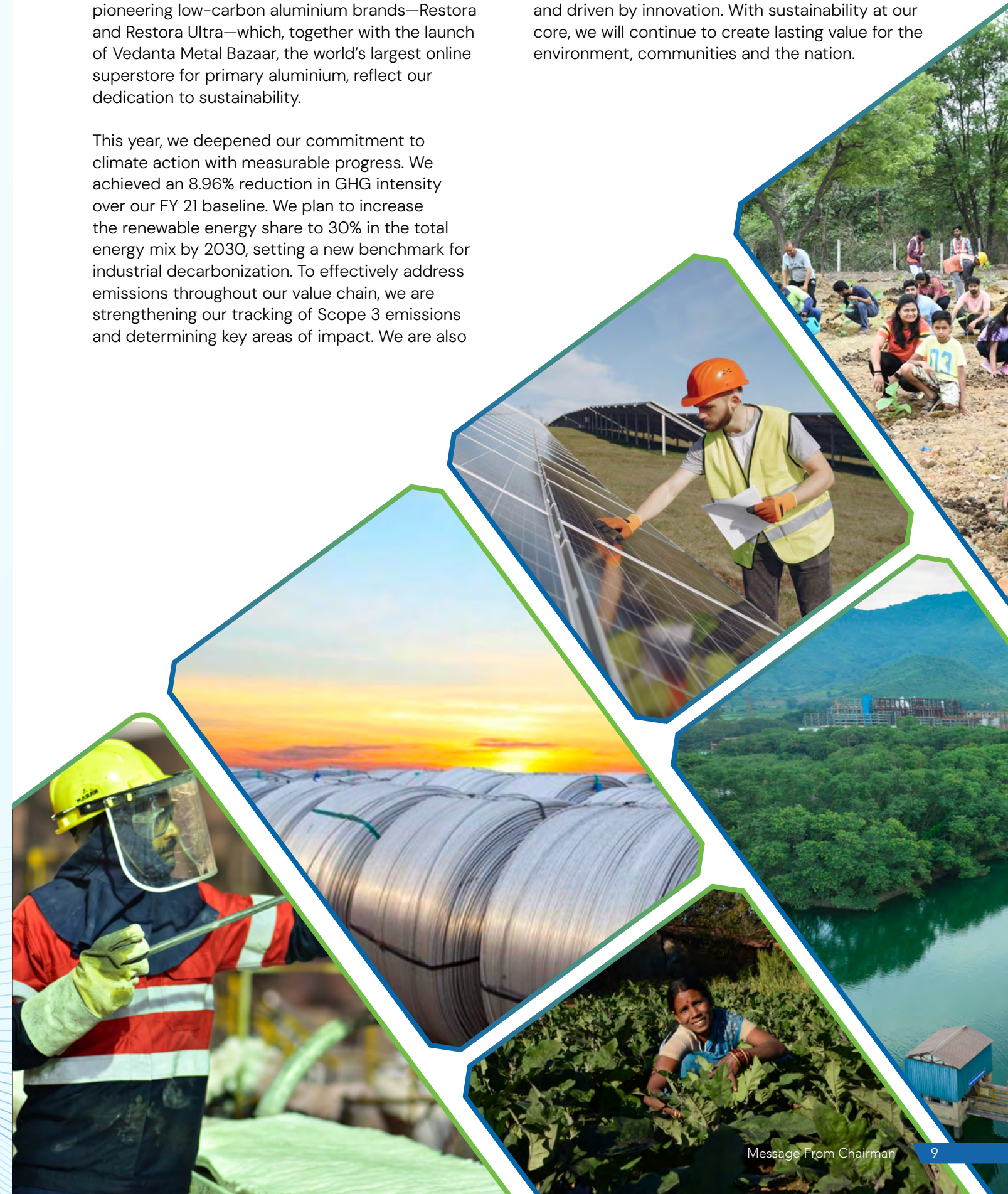
Our prized assets, the world class aluminium smelters and alumina refinery serve as engines of production and as enablers of socio-economic development in remote and underserved regions. As we actively expand our production capacities, we are conscious that we are not just pursuing our own growth; we are supporting India's journey toward self-reliance. The company's sustainability roadmap includes aims : achieving Net Zero Carbon by 2050 or sooner, achieving Net Water Positivity by 2030, and the integration of eco-conscious practices throughout our value chain.

Our operations, in the heartlands of resource-rich Odisha and Chhattisgarh, are powerhouses of high-quality aluminium and specialized alloys and, increasingly, products which are aligned with climate priorities. This drive is exemplified by our pioneering low-carbon aluminium brands—Restora and Restora Ultra—which, together with the launch of Vedanta Metal Bazaar, the world's largest online superstore for primary aluminium, reflect our dedication to sustainability.

This year, we deepened our commitment to climate action with measurable progress. We achieved an 8.96% reduction in GHG intensity over our FY 21 baseline. We plan to increase the renewable energy share to 30% in the total energy mix by 2030, setting a new benchmark for industrial decarbonization. To effectively address emissions throughout our value chain, we are strengthening our tracking of Scope 3 emissions and determining key areas of impact. We are also

promoting climate-resilient strategies to help local communities better prepare for, and adapt to, climate-related risks.

We are a future-ready business—resilient, inclusive, and driven by innovation. With sustainability at our core, we will continue to create lasting value for the environment, communities and the nation.



Message From CEO



Rajiv Kumar

Chief Executive Officer
Vedanta Aluminium

“

Together, we are not only managing climate risks—we are building a future where sustainability drives performance, resilience fuels innovation, and responsibility defines leadership.

As we unveil Vedanta Aluminium's Climate Action Report for FY 25, we reaffirm our commitment to building a future where industrial excellence and environmental resilience go hand in hand. As India's largest aluminium producer, we recognize the urgency of climate risks and the responsibility we carry in shaping a low-carbon, future-ready industrial landscape.

This Report reflects our proactive and sharpened approach to understanding, managing, and mitigating climate-related risks across our operations and value chain. We have made significant strides in accelerating our decarbonization roadmap—sourcing 1.55 billion units of renewable energy, aligning to India's Net Zero 2070 target and position us ahead of regulatory curves.

We are also diversifying our energy mix through biomass firing and natural gas substitution, while introducing electric forklifts and biodiesel-powered fleets to decarbonize logistics. Our flagship low-carbon aluminium brands—Restora and Restora Ultra—are redefining industry standards in sustainable manufacturing, with Restora Ultra ranking among the lowest GHG intensity aluminium products globally.

Our climate strategy is not just about risk mitigation—it's about unlocking opportunity. By investing in low-carbon technologies, expanding renewable energy adoption, and empowering communities to adapt to climate realities, we are shaping a business model that is both future-ready and inclusive. Beyond emissions, we are restoring ecosystems, reducing water and energy footprints, and collaborating with leading institutions to develop technologies for bauxite residue utilization and rare earth minerals recovery. Our partnerships with Council of Scientific & Industrial Research—National Metallurgical Laboratory (CSIR-NML), Institute of Mineral and Material Technology (IMMT), and Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC) reflect our commitment to circularity and innovation.

The pace of regulatory evolution around climate action is accelerating, and with it, the complexity of transition risks. Carbon pricing, disclosure mandates, and sector-specific decarbonization targets are reshaping the operating landscape. At Vedanta Aluminium, we are proactively aligning with this shift. Our internal carbon pricing framework is already influencing investment decisions, embedding climate accountability into our financial strategy. Through our engagement with NITI Aayog, we are actively contributing to the development of national decarbonization pathways—ensuring that our transition is not only compliant but catalytic in driving India's low-carbon future.

As we present this report, I extend my gratitude to our teams, partners, and stakeholders. Together, we are not only managing climate risks—we are building a future where sustainability drives performance, resilience fuels innovation, and responsibility defines leadership.



Message From Aluminium Sector COO

“

We continue to lead with purpose, invest with precision, and collaborate across ecosystems to unlock the full potential of aluminium in powering a sustainable tomorrow.

Vedanta Aluminium continues to demonstrate that climate ambition can translate into operational excellence. Across our operations we have consistently elevated our standards, demonstrating leadership in both industrial performance and sustainable practices. As India advances its climate policy architecture—with the introduction of carbon pricing mechanisms, the Carbon Credit Trading Scheme (CCTS), and enhanced disclosure requirements on emissions and climate risk—the aluminium sector is receiving focused attention due to its strategic role in energy transition and its emissions intensity profile. Vedanta Aluminium remains strongly engaged in assessing our current emissions performance, identifying high-impact levers across energy, logistics, and process efficiency, and aligning our operational roadmap with national and global climate priorities.

Sunil Gupta

Chief Operating Officer
Vedanta Aluminium

Aluminium is increasingly recognized as a foundational material for the global energy transition, owing to its lightweight properties, high strength-to-weight ratio, and near-limitless recyclability. Its application spans across critical clean technologies—including electric vehicles, solar and wind infrastructure, energy storage systems, and next-generation power transmission—positioning it as a strategic enabler of decarbonized growth. At Vedanta Aluminium, we are advancing this potential through a combination of product innovation, clean energy integration, and circularity-driven operations. Our low-carbon aluminium brands, Restora and Restora Ultra, are engineered to meet the sustainability demands of future-ready industries. With Restora achieving a carbon footprint less than 4 tCO₂e per MT of Aluminium, and Restora Ultra—produced from recovered aluminium dross, delivering less than 1 tCO₂e per MT of Aluminium, both ensuring gate to gate smelter boundary we are enabling global supply chains to meet ambitious climate targets. In parallel, we are scaling Vedanta Metal Bazaar into a full-spectrum digital ecosystem—integrating AI-driven demand forecasting, real-time carbon footprint tracking, and customized product solutions. This platform is evolving into more than a marketplace; it is becoming a strategic interface between low-carbon manufacturing and climate-conscious procurement.

Operationally, we are accelerating our transition to clean energy through round-the-clock renewable power agreement, alongside the deployment of electric vehicles and forklifts across BALCO's and Jharsuguda industrial ecosystem. Our power plants have co-fired over 3941 MT of biomass, and we are on track to maximise adoption of natural gas at Lanjigarh calciner. These initiatives have contributed to a 8.96% reduction in GHG emissions intensity compared to our FY 21 baseline.

As part of our strategic climate resilience roadmap, we are extending physical climate risk assessments to critical assets including the BALCO, Jamkhani Coal Mine, Jharsuguda, Lanjigarh refinery and the VGCB port facility. This step towards climate resilience will strengthen operational continuity, safeguard long-term asset value, and enhance risk-informed decision-making across our industrial footprint. The refreshed climate risk assessment across our key assets will further strengthen our strategic foresight, enabling us to anticipate disruptions, protect long-term value, and embed resilience into every layer of our operations. We will continue to lead with purpose, invest with precision, and collaborate across ecosystems to unlock the full potential of aluminium in powering a sustainable tomorrow.



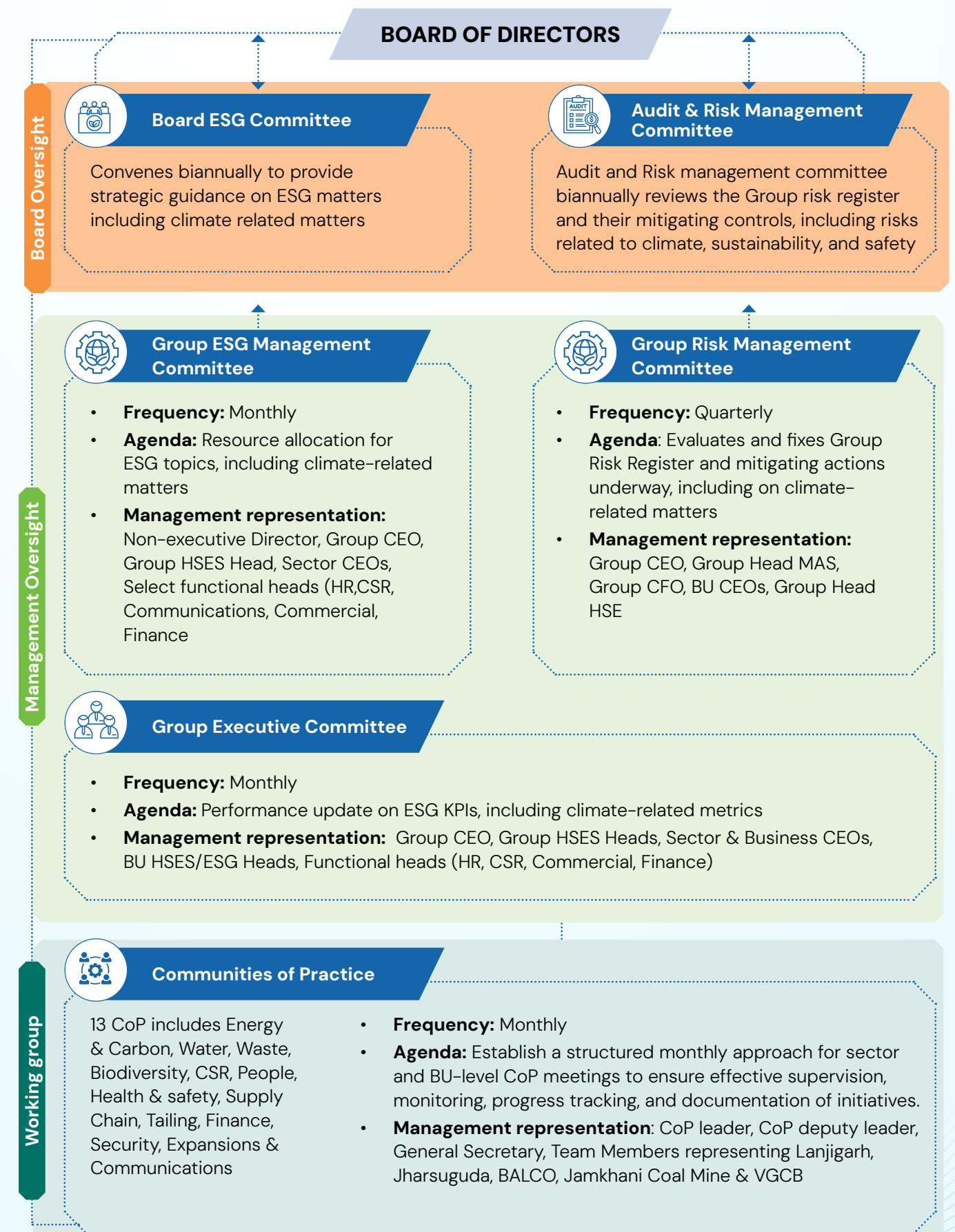


Climate Governance

Overview of Climate Governance

The Company's climate governance is anchored in a structured, three-tier model led by a forward-looking Board of Directors and expert management teams. Climate risks and opportunities are integrated into strategy, capital planning, and operations, with regular oversight by the ESG Committee. This ensures alignment with global policy trends, stakeholder expectations, and our commitment to responsible, transparent growth.

Climate Governance Structure at Vedanta Aluminium



Board Oversight

At Vedanta Aluminium, climate governance is anchored in strategic leadership and informed oversight by the company's board of directors. The Board assumes ultimate responsibility for guiding the company's sustainability vision, ensuring that climate-related risks and opportunities are embedded into the broader business strategy and risk management framework. With diverse expertise across energy, finance, public policy, and resource management, Board members are well-positioned to evaluate systemic climate risks and their implications for operational resilience and long-term value creation.

Supported by the Board ESG Committee, providing strategic oversight on climate matters, integrating sustainability into decision-making through regular engagement with leadership, investors, policymakers, and civil society. The board convenes biannually to review climate goals, KPIs, and incentives to reinforce accountability and align performance with ESG objectives—strengthening Vedanta's commitment to responsible growth and climate resilience.



Management Oversight

The management drives climate governance through a network of specialized committees with clear mandates and regular engagement. The Group ESG Management Committee sets priorities and allocates resources for climate initiatives, while the Group Executive Committee monitors ESG KPIs to ensure consistent performance tracking.

Along with the Group CEO and Sector CEO, the committee meets monthly to guide policy, assess progress, and foster a culture of climate

responsibility across the organization. The Group Risk Management Committee integrates climate risks into the enterprise risk register and leads mitigation efforts. Supporting the management, as a working group the Energy and Carbon Community of Practice implements carbon reduction measures across business units. Together, these bodies ensure climate risks are identified, assessed, and actively managed through cross-functional collaboration and continuous oversight.

Working Group

Communities of Practice (CoPs) form the backbone of Vedanta Aluminium's climate strategy execution. Thirteen domain-specific CoPs—including Energy & Carbon, Water, Waste, and Biodiversity—drive targeted action across business units through monthly meetings under a structured Management-in-Place (MIP) model. Each CoP is led by a designated team with representation from Lanjigarh, Jharsuguda, BALCO, Jamkhani Coal Mine, and VGCB, ensuring leadership continuity and cross-functional collaboration.

This cadence enables real-time tracking, data updates, and milestone alignment, while enhancing transparency, accountability, and continuous refinement of climate initiatives—embedding resilience into core operations.



Executive Compensation Linked to Climate-related KPIs

We foster a culture of sustainability by embedding ESG performance into leadership accountability and incentive systems. Senior management’s KRAs include measurable ESG objectives, ensuring climate actions are prioritized across business

units. Our internal recognition program rewards impactful contributions in emissions reduction, energy efficiency, and sustainable supply chains—driving continuous improvement and reinforcing our commitment to responsible growth.



Balanced Scorecard Approach to Performance Bonuses



ESG-Linked Bonus Structures



Long-Term Incentive Plan (LTIP) for Sustainability

Balanced Scorecard Approach to Performance Bonuses

Our annual performance bonus for management is structured around a balanced scorecard, incorporating financial, operational, sustainability, and strategic metrics. Notably, safety and sustainability indicators are key determinants of performance-linked incentives, reinforcing the **Vedanta Sustainability Assurance Program (VSAP)** as an integral variable pay component. This approach strengthens the link between executive remuneration and ESG commitments, ensuring that leadership drives progress toward sustainability goals.

ESG-Linked Bonus Structures

For FY 25, 15% of the total bonus for executives and employees is tied to ESG performance metrics, reflecting a strong emphasis on climate change mitigation efforts. This allocation includes:

- **5%** linked to safety performance.
- **10%** dedicated to sustainability achievements, including emission reductions and resource efficiency improvements.

A portion of the bonus payout is contingent upon meeting climate-related Key Performance Indicators (KPIs), reinforcing the importance of environmental responsibility in executive performance evaluations.

Long-Term Incentive Plan (LTIP) for Sustainability

To drive long-term sustainability performance, ESG considerations including climate targets are embedded in Vedanta’s LTIP. ESOSs are directly linked to both business performance and individual contributions towards predefined sustainability goals.

- ESOSs mature over a three-year performance period upon achieving critical sustainability milestones.

By linking long-term incentives to climate goals, Vedanta fosters environmental stewardship and encourages leadership teams to actively contribute to the company’s agenda.

Commitment to Collaborative Policy Development

To advance our climate leadership and foster innovation in sustainable aluminium production, Vedanta Aluminium actively collaborates with

industry associations, research bodies, and academic institutions across key strategic domains.

Industry Associations

- Aluminium Stewardship Initiative (ASI)
- Aluminium Association of India (AAI)
- International Aluminium Institute (IAI)
- Confederation of Indian Industry (CII) – Climate Action Charter

Research & Think Tanks

- NEERI Nagpur (National Environmental Engineering Research Institute)
- NML Jamshedpur (National Metallurgical Laboratory)
- NIAMT Ranchi (National Institute for Advanced Manufacturing Technology)
- IMMT Bhubaneswar (Institute of Minerals and Materials Technology)

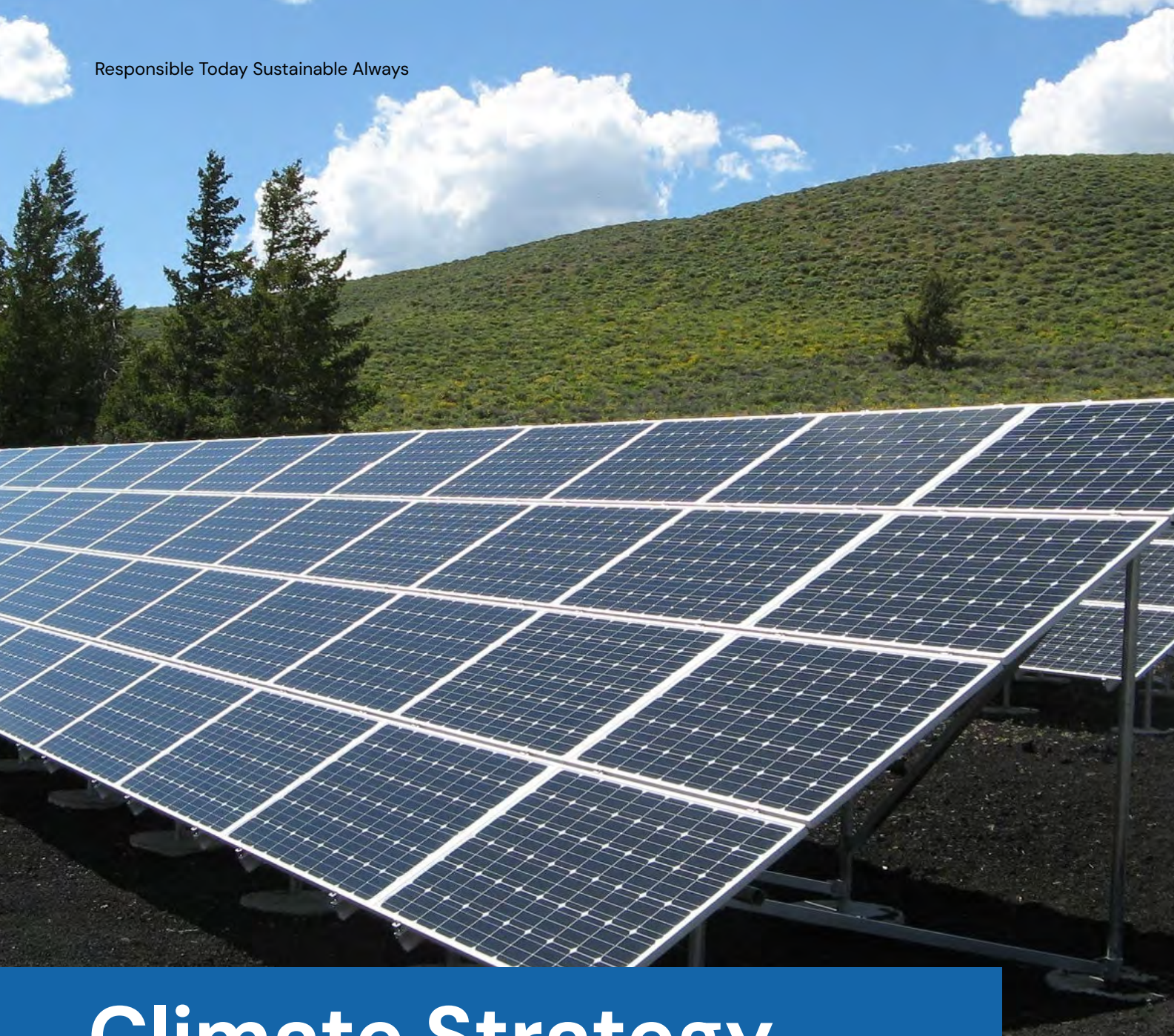
Academic Institutions

- NIT Rourkela
- IIT Kanpur
- IIT Bhubaneswar

Our Energy and Carbon Policy is a core pillar of the Vedanta Sustainability Framework, guiding our climate strategy through investments in renewable energy and innovation to reduce emissions. Governed by the Board and executed across all

levels, the policy embeds accountability—from senior leadership to operational teams—ensuring climate considerations are integrated into business decisions and fostering a culture of responsibility and continuous improvement.





Climate Strategy

Our Climate Strategy

Vedanta Aluminium views climate change as a catalyst for innovation and transformation. As a leader in India’s industrial landscape, we are embedding climate resilience into our core strategy, with a clear ambition to decarbonize operations and support the global energy transition.

Climate risk assessment is integrated into enterprise governance, ensuring physical, transitional, and financial risks are systematically identified and mitigated. Guided by our goal Net Zero Carbon by 2050 or sooner, we achieved a 27.56% reduction in GHG emissions intensity in FY 25 compared to our FY 12 baseline. Our science-based, adaptive climate strategy reflects our belief that sustainable growth is essential and that true industry leadership demands climate responsibility.

Our roadmap focuses on energy, operations, and innovation. We are planning for over 1,500 MW of renewable capacity through Power Delivery Agreements (PDAs) and have powered our operations with 1.55 billion units of renewable energy in FY 25. We continue to optimize resource efficiency and invest in clean technologies, while expanding our Restora product line—Restora, made from renewable energy, with emissions below 4 tCO₂e per MT of Aluminium, and Restora Ultra, made from recovered dross, both ensuring gate to gate smelter boundary, with emissions under 1 tCO₂e per MT of Aluminium,—signaling a shift toward circularity and community resilience.

We are driving bold action to future-proof our business, aiming for Net Zero Carbon by 2050 or sooner. Through clean energy adoption, decarbonization, and climate-smart innovation,

we are embedding sustainability across our value chain—enabling us to adapt, thrive, and lead in a rapidly evolving environmental landscape.

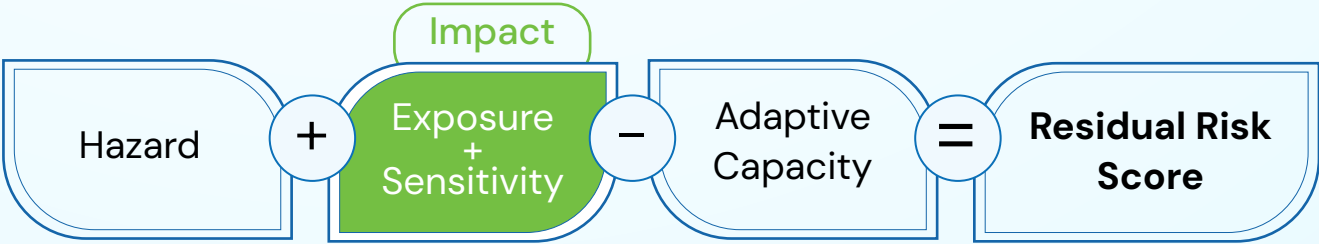
By expanding our analytical scope and aligning with global standards like IFRS S2 and TCFD, we are proactively managing both physical and transitional climate risks. Scenario-based insights from leading sources, including the IEA’s Global Energy Review 2025, inform our strategy—highlighting rising electricity demand and the aluminium sector’s exposure to energy volatility and carbon risk.

Our framework incorporates well-defined time horizons:

This structured approach supports proactive decision-making, investment planning, and reinforces our commitment to responsible growth and climate resilience.

Time period	Physical risk	Transition risk
Short term	2030	2030
Medium term	2050	2040
Long term	2100	2050

Our climate risk evaluation is grounded in the formula:



Scenario Analysis

Climate resilience begins with recognizing that tomorrow's climate may differ significantly from today's. As part of our growth strategy, we apply advanced scenario analysis to navigate environmental uncertainties, aligning with global temperature targets of 1.5°C and 2°C.

We assess risks and opportunities using IPCC RCPs and SSPs for climate trajectories, and NGFS scenarios to evaluate macroeconomic and financial impacts under varying policy intensities. This framework allows us to stress-test operations against physical and transition risks, embedding resilience into strategic planning and shaping a future-ready aluminium ecosystem.



NGFS **Current Policies scenario**: Existing climate policies remain in place, but there is no strengthening of ambition level of these policies, to a global warming of 3°C+ by 2100 and high associated climate impacts.



NGFS **Net Zero 2050**: Limits global warming to 1.5°C through stringent climate policies and innovation, reaching global **Net Zero Carbon emissions** around 2050



IPCC **SSP2 4.5** represents a scenario limiting the rise in average global surface temperatures between **2.5°C to 2.7°C** by the end of the century due to global efforts to reduce emissions.



IPCC **SSP5 8.5** being extreme scenario represents a scenario, leading to over 3.3°C to 5.7°C temperature rise by the end of the century due to minimal to no effort to reduce emissions

Physical Risk Assessment

Physical risk assessment is a multi-layered process to identify vulnerabilities and build resilience across operational sites. It begins with a baseline assessment and location-specific climate profiling using geospatial data, hazard history, and socio-environmental context—highlighting key risks like extreme heat, flooding, water stress, and cyclones.

Climate trajectory data is modeled using IPCC CMIP6 scenarios (SSP2 4.5 and SSP5 8.5). Hazards are evaluated for likelihood (high, medium, low) and potential business impact. Existing resilience measures—such as infrastructure

strength, emergency protocols, and community engagement—are assessed to determine adaptive capacity and calculate residual risk.

Targeted mitigation actions, including infrastructure upgrades, nature-based solutions, and climate-smart practices, are then identified to reduce residual risk and enhance long-term resilience. This forward-looking approach ensures operational agility in the face of escalating climate challenges.

Physical Risk Assessment

Build a climate profile through baseline assesment

Build Risk Index for physical risk hazards

Assess adaptive capacity considering the resilience measure in place

1

2

3

4

5

6

Collect physical risk scenario data

Identify Business and financial impact

Build resilience plan through identifying mitigation and adaptation measures

Physical climate risks are classified as **acute** (e.g., floods, cyclones) and **chronic** (e.g., rising temperatures, water stress), each posing unique challenges. This distinction enables targeted adaptation—balancing short-term emergency preparedness with long-term sustainability planning.

Acute Risks



Extreme Heat



Cyclone



Floods

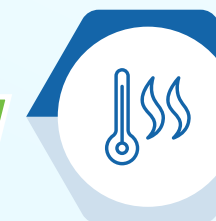


Extreme Precipitation



Landslides

Chronic Risks



Rising Average Temperature



Sea-Level Rise



Desertification



Glacial Retreat



Long-term shifts in precipitation patterns

Extreme Heat

Hazard

Rising ambient temperatures pose a physical climate risk, affecting workforce safety, operational efficiency, and asset performance. CIMP6 ensemble projections, consistent with the latest IPCC assessments, indicate an increase in the number of days annually with temperatures exceeding 40 °C. Prolonged exposure impacts the equipment and lubricants performance raising the operational costs and also increases the risk of chronic health issues among employees, including dehydration,

heat exhaustion, and cardiovascular stress—potentially impacting long-term workforce well-being and business continuity.

The annual count of days above 40 °C and maximum temperature levels is tracked as a key risk indicator for heat-related impacts. Our operational locations predominantly fall within medium to high heat stress zones, reinforcing the need for targeted climate adaptation measures.

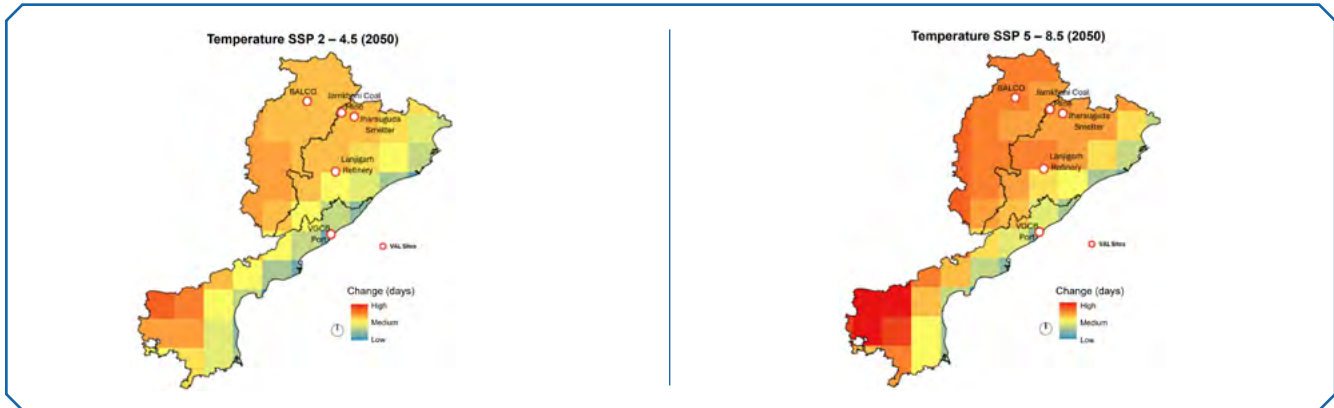


Figure 1: Increase in number of days annually with temperatures exceeding 40 °C by 2050 across SSP2 4.5 and SSP5 8.5 for Odisha, Chhattisgarh and Andhra Pradesh

Locations	Extreme Heat											
	Projected Increase in Days with temperature >40 °C						Projected Maximum Temperature(°C)					
	SSP2 4.5			SSP5 8.5			SSP2 4.5			SSP5 8.5		
	2030	2050	2100	2030	2050	2100	2030	2050	2100	2030	2050	2100
BALCO	5	14	23	6	17	47	47.2	48	49.1	47.1	48.3	51.2
Jharsuguda	4	13	22	4	16	46	46.7	47.5	48.6	47.7	48.9	51.9
Lanjigarh	3	9	16	4	12	36	43.7	44.4	45.3	46.3	47.5	50.2
Jamkhani Coal Mine	4	13	22	5	16	46	47	47.8	48.9	47.1	48.4	51.3
VGCB	1	2	4	1	2	9	36.1	36.7	37.4	42.7	43.7	46

Low

Low to Medium

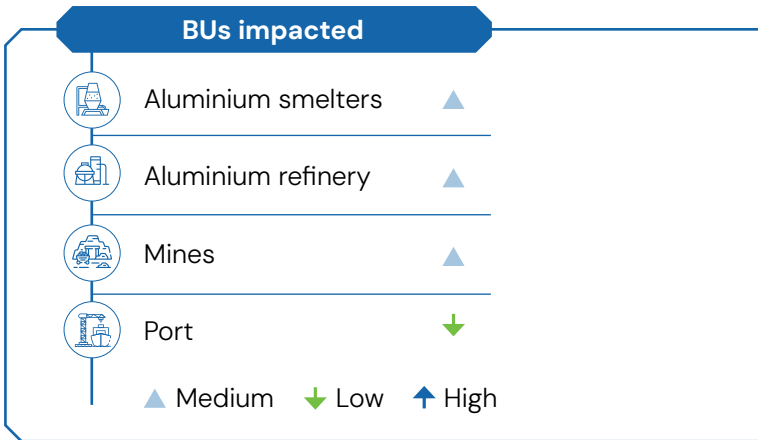
Medium to High

High

Extremely High

Impact

Extreme heat significantly impacts employee productivity by causing fatigue, heat stress, and increased health risks, which can lead to reduced efficiency and higher absenteeism. It also impacts the equipment performances, and raises maintenance demands, prompting greater investments in ventilation systems, protective gear, thermal roof cooling, advanced monitoring technologies, and resilient logistics to ensure safe and uninterrupted operations.



Adaptive Capacity

In response to intensifying heat risks, a suite of adaptive practices has been progressively integrated across all operational sites to help safeguard workforce wellbeing and ensure continuity of critical activities.

Work schedules are thoughtfully adjusted in alignment with regulatory guidance, with high-exposure tasks typically deferred outside peak temperature windows. Site teams play an active role in reinforcing these protocols, fostering a culture of safety and vigilance.

- Cooling infrastructure, including strategically placed rest sheds fitted with desert coolers and fans, offers essential respite during scheduled breaks, helping mitigate heat stress.

- Targeted training programs equip personnel with practical knowledge on early symptom recognition, hydration strategies, PPE usage, and emergency response pathways.
- Emergency readiness is supported through formal Heat Stress Management Plans and SOPs.
- Hydration access is prioritized through frequent water stations (every 200–300 meters), with ORS and chilled beverages made available not only to employees and drivers but also to nearby community members during peak conditions.
- For heat-intensive operations, PPE provisions are continuously reviewed, with upgrades underway to improve thermal comfort and protective performance.

Floods & Cyclone

Hazard

The increasing frequency and severity of extreme precipitation events pose significant challenges by disrupting operations, damaging assets, and endangering workforce safety. Intense rainfall can lead to site inundation, causing production delays, equipment damage, and elevated maintenance costs. Additionally, floodwaters can interrupt logistics and supply chains, hinder the movement of materials, and restrict site accessibility.

CMIP6 ensemble projections, consistent with the latest IPCC assessments, are used in the analysis to assess changes in extreme precipitation intensity. Maximum precipitation cumulative within 5 days and flash flood vulnerability are tracked as key risk indicators to monitor and anticipate flood-related impacts.

Extreme Precipitation

Climate projections (CIMP6 ensemble) indicates that all the locations are expected to see increase in maximum 5-day precipitation under SSP5 8.5 scenario.

Flash Flood Vulnerability

Flash Flood Vulnerability assesses the susceptibility of areas to flash floods by integrating factors such as runoff potential and drainage density. High runoff and dense drainage networks accelerates water flow,

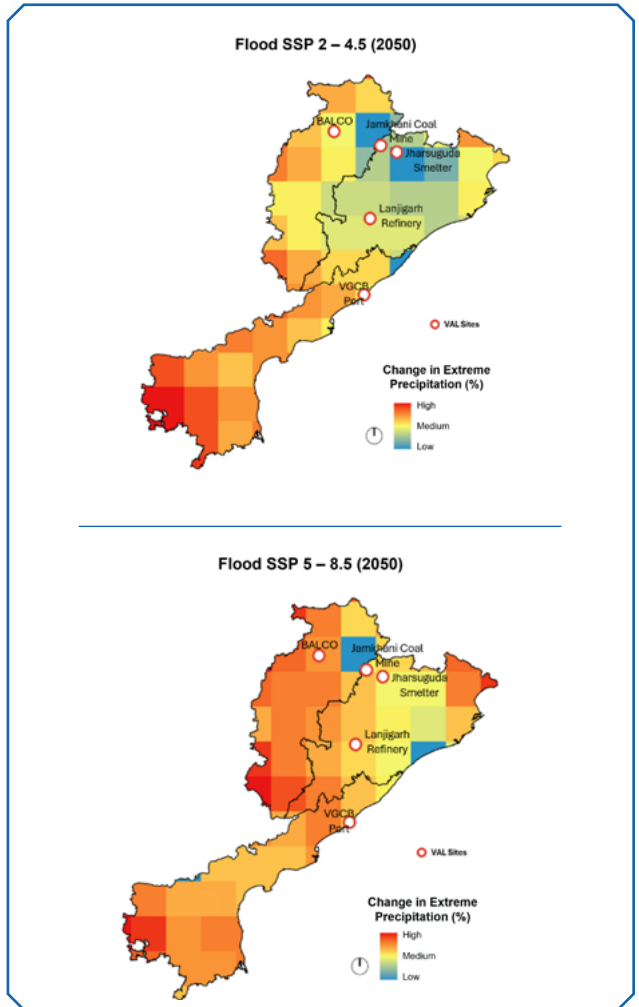


Figure 2: Change in extreme precipitation by 2050 across SSP2 4.5 and SSP5 8.5 for Odisha, Chhattisgarh, and Andhra Pradesh

heightening flood risk. BALCO and VGCB exhibit high vulnerability, while other sites show moderate to high exposure. Importantly, this analysis offers a forward-looking assessment, ensuring that even in

areas without a history of flash floods, potential risks to infrastructure and communities are identified for proactive planning (Source: NRSC, ISRO).

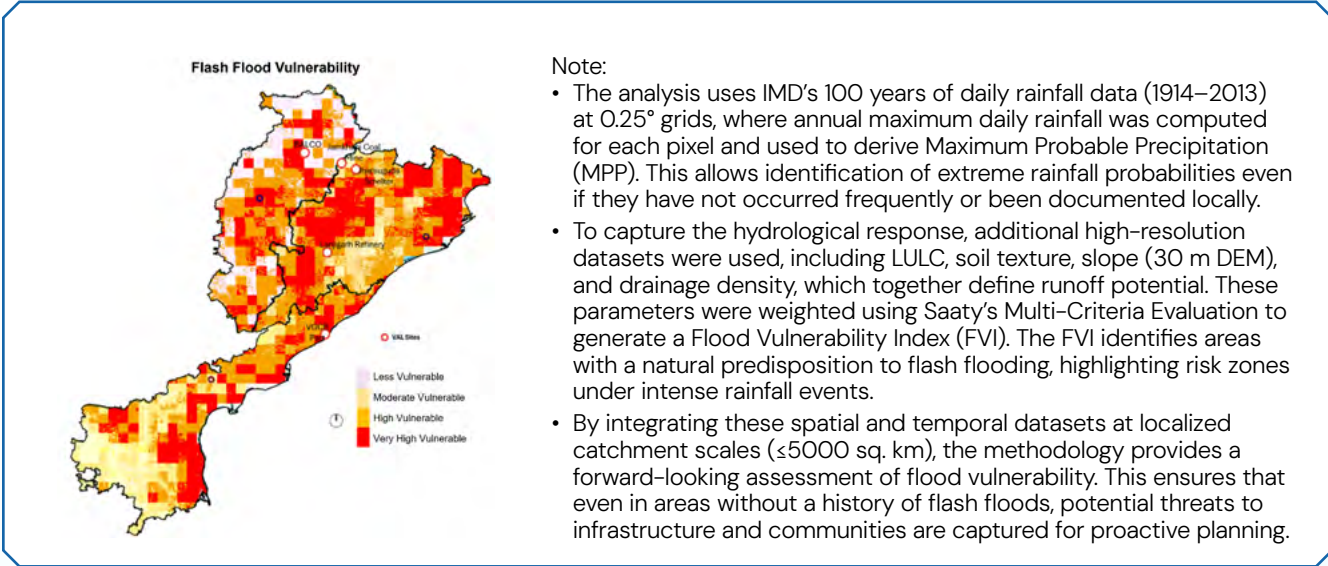


Figure 3: Flash Flood Vulnerability across Odisha, Chhattisgarh, and Andhra Pradesh.

Locations	Extreme Precipitation					
	% change in extreme precipitation					
	SSP2 4.5			SSP5 8.5		
	2030	2050	2100	2030	2050	2100
BALCO	3.1	4.5	15.5	3.7	9	25.4
Jharsuguda	4.8	7.5	16.1	6.7	10.1	28.6
Lanjigarh	-1.7	3.2	6.9	1.9	6.2	19.6
Jamkhani Coal Mine	2.3	1.8	12.5	2.5	6.3	24.6
VGCB	-1.7	4.9	5.1	-1.4	6.4	15.2

Low Medium to High High Extremely High

Cyclone

Tropical cyclones, pose significant risks to infrastructure, supply chains, and power stability. Climate projections based on CIMP6 ensemble models, suggest that the Indian Ocean region is expected to experience more frequent Category 1 and 5 cyclones. Among the sites analyzed, Lanjigarh refinery has faced Category 1 cyclones, while VGCB Port has experienced Category 5—underscoring its markedly higher vulnerability. Rising wind speeds will further heighten the risk and impact of future cyclonic events.

Overall our operational locations fall within a medium cyclone risk zone, calling for a proactive resilience planning and robust contingency measures.

Impacts

Flooding and cyclonic conditions present Flooding and cyclonic conditions present important considerations for equipment resilience, operational planning, and site safety protocols. Elevated rainfall levels can lead to enhanced processing and compliance requirements, while evolving insurance landscapes call for strategic financial planning.

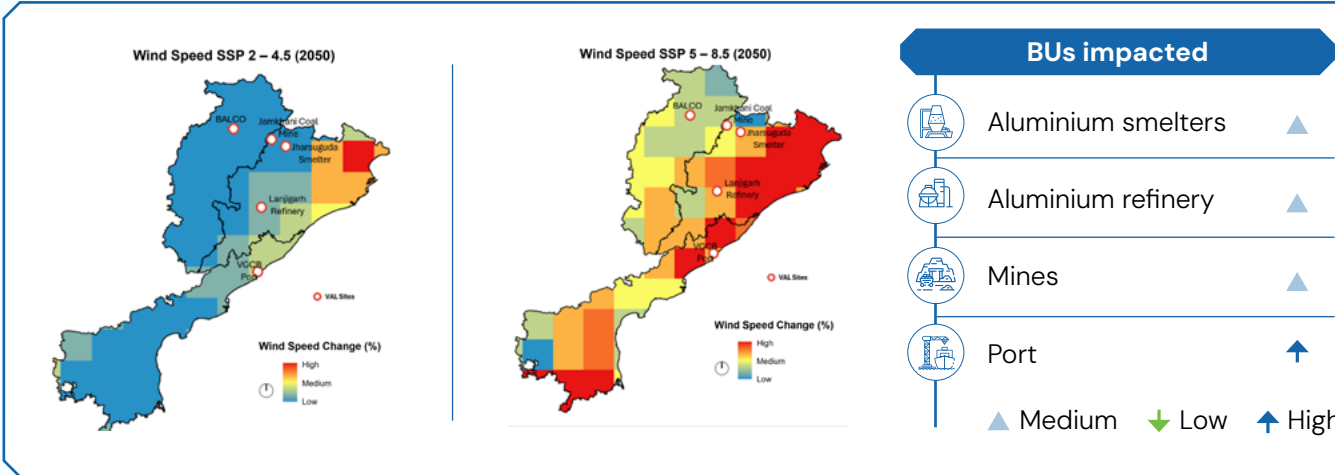


Figure 4: Change in wind speed by 2050 across SSP2 4.5 and SSP5 8.5 for Odisha, Chhattisgarh, and Andhra Pradesh

Locations	Change in wind speed					
	% change					
	SSP2 4.5			SSP5 8.5		
	2030	2050	2100	2030	2050	2100
BALCO	-1.3%	0.9%	2.2%	-1.3%	0.9%	3.3%
Jharsuguda	-1%	1%	0.9%	-1%	1.6%	5.6%
Lanjigarh	-0.3%	1.9%	1.7%	-0.3%	1.9%	6.3%
Jamkhani Coal Mine	-1.2%	0.8%	1.6%	-1.2%	0.8%	3.2%
VGCB	-0.4%	0.7	1.7%	0.8%	1.9%	5.7%

Low Low to Medium Medium to High High Extremely High

Optimizing stormwater management unlocks greater potential for wastewater reuse—supporting wheel washes, sprinkling, and horticulture—and helps preserve soil integrity and drainage efficiency

across plants and tailing dams. Cyclonic activity further highlights the value of robust infrastructure and timely maintenance strategies.

Adaptive Capacity

To strengthen resilience against flooding, a suite of pre-monsoon preparedness activities is systematically implemented across operational sites, aimed at minimizing disruption and safeguarding workforce and community wellbeing. Routine cleaning of nallahs, comprehensive drainage inspections, and readiness checks at flood control centers ensure that essential tools and infrastructure are in place ahead of the monsoon season.

- Advanced weather stations installed across sites enable early monsoon monitoring and support timely response planning, enhancing situational awareness and decision-making.

- At the **Jharsuguda site**, a dedicated disaster management cell operates with formal SOPs for flood and cyclone events, coordinating closely with local communities to reinforce preparedness and response efforts.
- Emergency support systems** include a 24x7 helpline for authorities to expedite response times, while flood control centers are equipped with life jackets, dewatering pumps, PPEs, cutting tools, lifting tools, and other critical equipment.
- Financial safeguards** are maintained through adequate insurance coverage, helping mitigate potential impacts from flood-related damages and ensuring business continuity.

Transition Risk Assessment

The shift to a low-carbon economy poses financial, legal, reputational, market and operational risks. Using NGFS scenarios, we assess likelihood and exposure of emerging regulations like carbon pricing, and stakeholder expectations to align

strategy, enhance resilience, and seize climate transition opportunities. We have assessed the transition risks across four categories as shown below.



Policy and Legal

Arises from changes in climate-related regulations, laws, and policies—such as carbon pricing, emissions caps, or mandatory reporting requirements—that may increase operational costs or require strategic shifts.

- Emerging Regulations – Emissions & Disclosure Related
- Carbon Pricing Mechanism





Market

Involves shifts in supply and demand dynamics, consumer preferences, and investor expectations driven by climate awareness and sustainability trends, potentially affecting revenue and competitiveness.

- Change in consumer preference
- High Dependence on Coal as Primary Energy Source

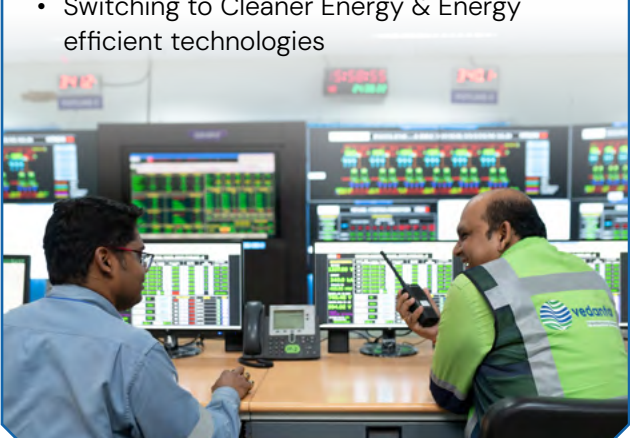




Technology

Results from the emergence of low-carbon technologies that may disrupt existing systems, require capital investment, or render current processes obsolete.

- Adopting lower emission advanced technologies
- Switching to Cleaner Energy & Energy efficient technologies





Reputation

Stems from stakeholder perceptions, public scrutiny, and media attention related to an organization's climate performance, which can influence brand value, customer loyalty, and access to capital.

- Increasing awareness among stakeholders & investors



POLICY & LEGAL

Emerging Regulations – Emissions & Disclosure Related

Risk

As climate regulations strengthen, businesses face rising risks from stricter emissions controls and reporting standards. Enhanced disclosure frameworks demand transparency, exposing firms to litigation for non-compliance, missed targets, or environmental harm. These shifts compel alignment with low-carbon pathways, reshaping operations amid the transition to a sustainable economy.

BUs impacted		
	Aluminium smelters	▲
	Aluminium refinery	▲
	Mines	▲
		▲ Medium ▼ Low ▲ High

Risk description in Current Policies	Risk description in NZE2050
As India has taken a target of Net Zero Carbon emissions by 2070, it is expected that regulatory landscape will strength further increasing difficulty in obtaining clearances and compliance costs. Indian specific regulations like: - Renewable purchase obligations (RPO) - Hazardous waste management & Extended Producer Responsibility regulations - Integration of climate assessments as part of EIA - Installation of FGD (Flue gas desulphurization) systems for coal-based thermal power plants* - Reporting obligations like DJSI *Not applicable to Jhasuguda and Lanjigarh site.	By 2050, global emissions are projected to drop 83%, driven by rising investments in renewables, falling solar costs, and stricter regulations. India's 500 GW renewable target may result in mandates strengthening for high-emission industries and coal use facing increasing scrutiny and penalties.

Impact

- Penalties for noncompliance:** Regulations are expected to get stringent which will drive up compliance costs. Non-compliance may attract hefty fines and enforcement action by relevant environmental authorities.
- Increasing capital investment for compliance** BALCO falls under category B of FGD requirement, requiring installation of FGD systems installation by December 2028 to avoid operational disruptions and environmental compensation penalties, but they are capital intensive.
- Opportunity to attract investors & capital investments:** Meeting waste, emission, and climate disclosure norms enhances sustainability credentials, attracting a broader pool of investors and easing access to capital for innovative, eco-friendly initiatives.
- Fluctuating RE prices:** Rising RE demand may cause renewable electricity costs to fluctuate. IREC prices are projected to increase factoring in inflation.

Adaptive Capacity

We ensure rigorous environmental compliance across our BALCO, Lanjigarh, Jharsuguda, and Jamkhani sites through continuous emissions monitoring and structured waste management practices. Emissions are tracked with biannual reports submitted to the Central Pollution Control Board (CPCB), while fly ash is repurposed for use in cement and infrastructure, supporting circular economy goals. Emission control systems include a Fume Treatment Plant (FTP) with more than 99% fume and fluoride removal efficiency, Hybrid Electrostatic Precipitators (ESP), bag filters, mist cannons, and dust suppression systems. Real-time monitoring is enabled through RTDAS, connected to CPCB and SPCB. Closed conveying systems, fluoride monitoring, and wheel wash units further reduce fugitive emissions and dust. Hazardous waste is sent to Treatment, Storage & Disposal Facilities (TSDF) for safe recycling and disposal, ensuring alignment with regulatory standards.

At Jharsuguda, a comprehensive set of initiatives minimizes environmental impact and ensures full compliance with waste management regulations. A High Concentration Slurry Disposal (HCSD) system enables safe ash handling. The Runaya dross processing unit recovers metal and converts depleted dross into briquettes for steel plants, enabling a zero-waste process. Spent Pot Liner (SPL) mixed fines are co-processed in the cement industry, reducing hazardous waste and clinker demand. An Organic Waste Converter processes 250 kg/day of food waste into nutrient-rich compost. Emission control systems include a

Fume Treatment Plant (FTP) with more than 99% fume and fluoride removal efficiency, Hybrid Electrostatic Precipitators (ESP), bag filters, mist cannons, and dust suppression systems. Real-time monitoring is enabled through RTDAS, connected to CPCB and SPCB. Closed conveying systems, fluoride monitoring, and wheel wash units further reduce fugitive emissions and dust.

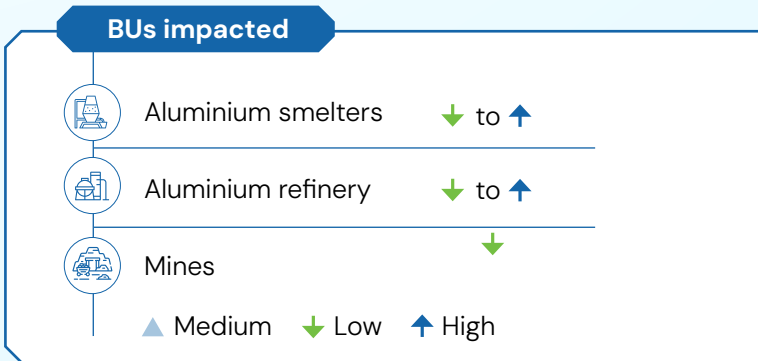
At Lanjigarh, hazardous waste is sent to authorized recyclers and co-processors for sustainable disposal. Fly ash and red mud are managed through high-concentration slurry disposal to reduce dust emissions. Fly ash is used in road construction through a partnership with NHAI, while red mud is sold to cement plants. Emissions are monitored via five Continuous Emission Monitoring Systems (CEMS) and six Continuous Ambient Air Quality Monitoring Stations (CAAQMS).

At Jamkhani Coal Mine, reduction of waste backfilling of overburden is in progress, and water management is supported through the construction of sumps, ponds, and the installation of Effluent Treatment Plants (ETP) and Sewage Treatment Plants (STP) for recycling and reuse. Biodiversity is promoted through extensive plantation efforts, including safety zone plantation, Miyawaki dump plantations on backfilled area, and gap plantations. Sustainability reporting is conducted via Enablon, aligned with BRSR and GRI frameworks.

Carbon Pricing Mechanism

Risk Description

As India adopts carbon markets, businesses face rising risks from evolving regulations, mandatory emissions reporting, sector-specific caps, and participation in trading schemes—demanding compliance, transparency, and strategic adaptation to avoid financial and operational setbacks.



Risk description in Current Policies

Carbon Pricing Regulations

- Under the Carbon Credit Trading System in India aluminium smelters and refineries are required to reduce their carbon intensity below a particular cap.

Carbon Border Adjustment Mechanism

- CBAM which is to be applicable from Jan 2026 applicable in the European Union and UK CBAM from Jan 2027 will put a fair price on imports of certain goods and selected precursors whose production is carbon intensive which includes aluminium.

Risk description in NZE2050

Model projections indicate that there is likely to be a notable surge in carbon pricing within the forthcoming decades to drive the transition towards “Net Zero by 2050 or sooner” scenario. Delayed action would necessitate even higher emission prices in the medium to long run.

Impact

Price volatility: The introduction of CBAM will require adjustments to product pricing and may compress profit margins, potentially leading to reduced business volumes.

Purchase of carbon credits: Carbon Credit Certificates will have to be purchased equivalent to the additional emissions above the cap emissions set by the Carbon Credit Trading System in India.

Technical advancements to reduce emissions:

Adoption of latest less emission intensive technology & switching to renewable energy sources will increase capital costs.

Market differentiator: Initiatives to comply by carbon pricing regulations can result in production of low carbon aluminium. This presents a significant opportunity to enhance export potential, particularly to sustainability-driven regions that prioritize low-carbon and environmentally responsible materials.

Adaptive Capacity

We are committed to reducing carbon intensity by 28% from the FY 21 baseline by FY 30, supported by a range of strategic and operational measures. A key initiative includes the integration of Internal Carbon Pricing (ICP) into investment decisions, with a shadow carbon price of USD 15 per tCO₂e adopted in FY 23. This mechanism helps evaluate the financial impact of emissions and guides capital allocation toward low-carbon technologies, renewable energy, and energy-efficient systems. In FY 22, we launched our low-carbon aluminium brand, featuring two products: Restora (emission intensity <4 tCO₂e per MT) and Restora Ultra (emission intensity <1 tCO₂e per MT), both ensuring gate to gate smelter boundary and with emission intensities significantly below the industry benchmarks.

Site-specific actions reinforce our decarbonisation efforts. At BALCO, shifted to electric forklifts to reduce fossil fuel use and emissions, reduced voltage loss in the aluminium production line to

save energy and utilised 2,993 MT of biomass for co-firing in power plants. At Lanjigarh, we optimised Cooling Water Pump Efficiency in the 3 MMT per annum Evaporation System, saving 2.2 MU annually and cutting 1,640 tCO₂e in emissions. We also co-fired 948 MT of biomass, interconnected the Plant Air and Instrument Air lines (saving 2,925 MWh and reducing 2,432 tCO₂e annually), and have a planned substituted natural gas in the alumina refinery calciner to reduce process emissions. These measures have lowered operational costs and supported sustainability goals.

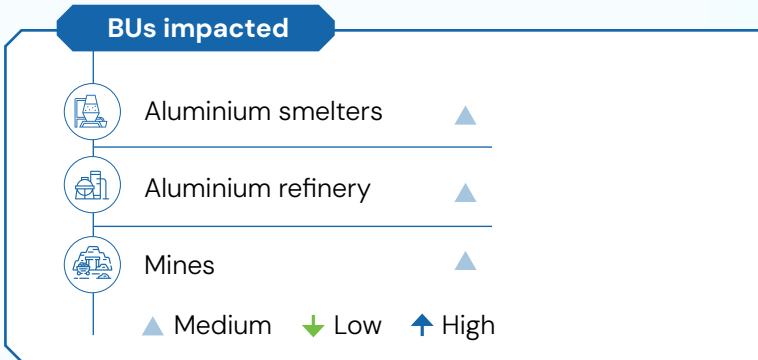
At Jharsuguda, we sourced 1,336 MU of renewable energy for FY 25, and deployed patented Vedanta Lining Design (VLD) in potline operations, incorporating graphitized cathodes and copper collector bars, also IE3/IE4 motors to optimise energy use. Additionally, under the Matrivan Campaign – Ek Ped Maa Ke Naam we planted over 100,000 saplings on reclaimed ash land, enhancing carbon sequestration potential.

 MARKET

Change in consumer preference

Risk

Rising climate awareness are driving customers away from conventional aluminium. Companies must innovate to stay competitive, reduce emission intensity of the products and ensure lower environmental impact, we have acknowledged the rise in shift of consumer preference with a strong climate strategy and decarbonisation plan in place.



Risk description in Current Policies

Aluminium producers face growing pressure to adopt sustainable practices like recycling and energy efficiency. Consumer demand in automotive, construction, and packaging sectors is shifting toward eco-friendly materials. This trend, aligned with corporate sustainability goals, is driving low carbon aluminium adoption, with market growth projected at a 5.65% CAGR through 2034.

Risk description in Net Zero 2050

By 2050, 96% of primary aluminium is expected to be produced using technologies like inert anode smelting and clean energy. Meanwhile, recycled aluminium's share will grow from 36% in FY 22 to 56%, significantly cutting energy use and emissions across the industry. This will create a market that encourages low carbon aluminium production over conventional aluminium.

Impact

- **Market Share Risk:** Producers face losses as buyers shift to low-carbon or recycled aluminium. Premium pricing of eco-friendly options makes traditional products less competitive.
- **Supply Chain Shift:** Rising demand for traceability and sustainability is forcing rapid adaptation across the value chain.
- **Low carbon Aluminium Demand:** Consumers increasingly prefer low carbon aluminium and are willing to pay a premium.
- **Cost Pressures:** Sustainable manufacturing requires capital investment, raising product costs—competitive pricing remains critical.
- **Emission Reduction Opportunity:** A higher share of low carbon aluminium is key to staying competitive in a cost- and sustainability-driven market.
- **Long-Term Advantage:** By 2050, low carbon aluminium is projected to be more cost-effective than conventional due to clean energy, recycling, and circular manufacturing advances.

Adaptive Capacity

In response to the growing demand for sustainable materials, we launched Restora, a low-carbon aluminium brand produced using renewable energy sources, with a carbon intensity of less than 4 tCO₂e per MT of Aluminium,—significantly lower than conventional alternatives. Building on this innovation, Restora Ultra was introduced, with emissions below 1 tCO₂e per MT of Aluminium, manufactured from recovered aluminium from dross, both ensuring gate to gate smelter boundary. This process exemplifies circular economy principles and reinforces Vedanta's zero-waste commitment.

Vedanta Aluminium became the first exporter of low carbon aluminium from India, establishing market leadership in sustainable metal production. To maintain competitiveness and support climate-conscious growth, plans are underway to expand the low-carbon aluminium portfolio by 2030. We plan to increase the renewable energy share

to 30% in the total energy mix by 2030. We are planning to achieve 1500 MW of clean energy via Power Purchase Agreements (PPAs) and direct use, along with a 218 MW round-the-clock agreement at BALCO and 275 MW at Jharsuguda currently in progress.

Restora Ultra is produced in partnership with Runaya Refining, using TAHA International's patented dross processing technology, which transforms smelting by-products into high-value aluminium—enhancing operational efficiency and advancing sustainable manufacturing in India's resource sector. Both Restora and Restora Ultra can be customized into Billets, Primary Foundry Alloy (PFA), Wire Rods, Slabs, P1020 Ingots, and other formats tailored to end-use industry needs.

In FY 25, the Company achieved sales of 62.26 kilotonnes and 3.40 kilotonnes of low carbon aluminium under its "Restora" and "Restora Ultra" brand respectively, with aspirations to increase this capacity to 100 kilotonnes

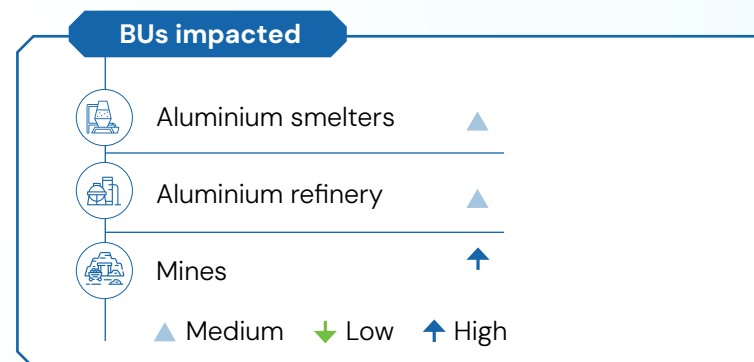


High Dependence on Coal as Primary Energy Source

Risk

Heavy reliance on coal poses risks amid shifting market expectations and climate goals. As demand for low-carbon energy grows, coal-dependent businesses face declining competitiveness, rising operational costs, and strengthening regulations. Adapting to sustainable energy trends is essential for long-term viability and alignment with emerging climate standards.

We have adopted Power Purchase Agreements (PPAs) to integrate renewable energy, reducing reliance on coal. This strategic move shields our refinery and smelters from rising energy price



volatility, helping mitigate medium-level risks linked to fluctuating coal and renewable energy costs amid growing demand.

Risk description in Current Policies

NGFS states that coal prices may remain relatively stable. Thus, thermal power costs are not expected to rise significantly, and fossil fuels will likely remain the dominant energy source through 2050. Thereby reliance on coal may not pose a threat

Risk description in Net Zero 2050

CEEW has stated that India's aluminium sector needs ₹2.2 lakh crore (\$29B) in CAPEX to reach Net Zero Emissions. NGFS states that coal prices may double by 2050, prompting a shift from coal due to its high CO₂ emissions. In the "Net Zero 2050" scenario, renewables and biomass will dominate global primary energy supply.

Impact

Energy price volatility and pressure to shift to renewable energy: Rising coal prices will increase electricity costs, driving up operational expenses for thermal power-dependent industries. To mitigate this, companies must invest in renewable energy infrastructure. While grid-based renewable energy can lower operational costs, price fluctuations from growing demand may reverse savings—making long-term contracts with renewable suppliers essential for stability.

Reduced demand for coal: With drop in LCOE for solar and wind energy companies may have to adopt RE on large scale resulting in reduction of requirement for coal.

Opportunity to reduce dependency on non-renewable sources of energy: According to NGFS 2030 – 2040 is going to be the decade wherein the LCOE for solar and wind energy is going to have the maximum % reduction, quick expansion of adoption of RE will help reduce price fluctuations of renewable energy, increasing rates of electricity from non-renewable sources and emissions.

Adaptive Capacity

We are actively reducing reliance on non-renewable energy by introducing products and processes that prioritize renewable procurement, process electrification, bio-based alternatives, and energy efficiency. A key focus is the expansion of Restora, our low-carbon aluminium brand produced entirely using renewable energy. To support this, we plan to increase the renewable energy share to 30% in the total energy mix by 2030, backed by plans to source approximately 1,500 MW of clean energy through Power Purchase Agreements (PPAs) and

direct use—including a 218 MW round-the-clock agreement at BALCO and 275 MW at Jharsuguda.

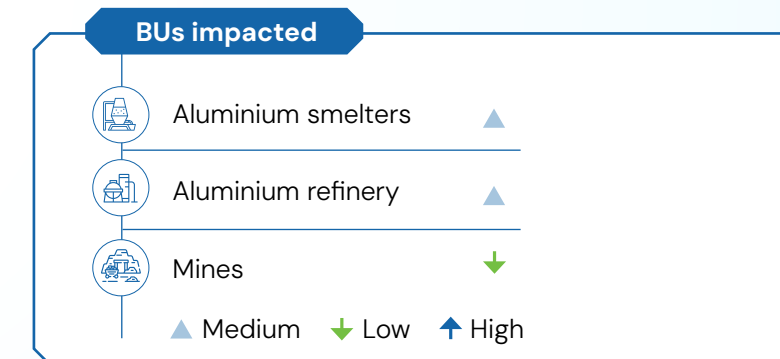
At BALCO, electric furnaces have been adopted to enable cleaner operations, as they can be powered by renewable sources. Additionally, 3,941 MT of biomass has been co-fired in power plants to reduce fossil fuel consumption. Transport and fuel shifts include India's largest EV forklift fleet at Jharsuguda, now scaling to other sites. To further enhance energy efficiency, waste heat recovery systems capture excess process heat for ore digestion.

TECHNOLOGY

Adopting lower emission advanced technologies

Risk

The transition to a low-carbon economy is accelerating technological disruption across industries, challenging businesses reliant on legacy systems and carbon-intensive infrastructure. As climate-related disclosures gain prominence, companies face mounting pressure to integrate clean technologies and digital solutions that support sustainability goals. Simultaneously, consumer demand is shifting toward smart, low-impact products, driving innovation in areas like renewable energy, low carbon manufacturing, and circular economy platforms.



Risk description in Current Policies

India is undertaking various measures to support technological interventions creating an environment for manufacturers to adopt them to stay competitive in the market like:

- Industry 4.0 adoption through initiatives like SAMARTH Udyog Bharat 4.0 which has resulted in the growth projections of IoT-connected machines market have a CAGR of 18.49% (2024–2032), and 54% of firms have adopted AI.
- Electrification of freight is advancing via ZEV-EMI and E-FAST programs.
- NITI Aayog is developing a CCUS policy with incentives covering CO₂ capture, transport, storage, and utilization, enabling carbon credit trading.

Risk description in Net Zero 2050

Industries will have to adopt technologies to keep in pace with the targets undertaken by India. With strengthening regulations around energy efficiency, water and resource management, and rising carbon pricing, digitization and AI are poised to become critical tools for optimizing resource use and manufacturing efficiency. IEA states that the global EV fleet is projected to expand rapidly, growing at an average annual rate of 27% through 2035. According to NGFS, by 2050, industrial carbon capture and storage (CCS) is expected to increase approximately 2.5 times compared to current policy scenarios, driven by stricter environmental mandates, technological advancements in CCUS, and improved economic viability.



Impact

- **Digitization & IoT** boost efficiency and competitiveness but demand high investment, skilled teams, and system alignment to avoid delayed ROI.
- **Freight Electrification** is rising due to fuel costs, emission norms, and EV policies—despite higher upfront costs.
- **Retrofitting** with inert anodes and biomass

cuts SO₂, lowers emissions by 23%, and reduces costs by 3%, though it requires replacing legacy systems.

- **Tech ROI:** CCUS and EV freight reduce emissions and fuel use. EV trucks offer 50% lower fuel costs and better Scope 3 ROI.
- **Smart Manufacturing:** Real-time monitoring and AI simulations cut downtime, optimize inputs, and enable low-emission, market-aligned production.

Adaptive Capacity

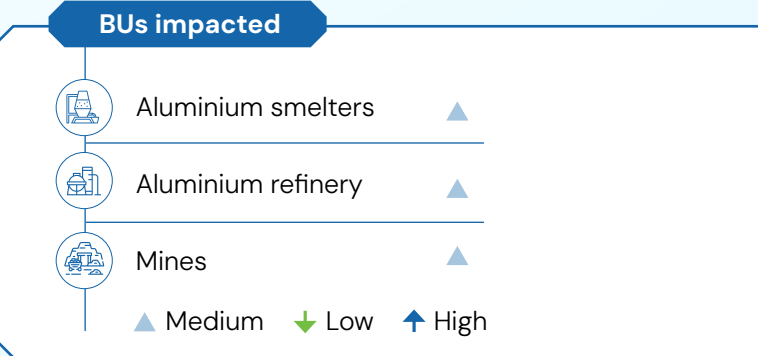
We have extensively leveraged IoT and digitization to enhance the efficiency of energy and resource consumption, thereby contributing to a measurable reduction in emissions. IoT-based technologies are deployed for cooling water analysis, enabling significant reductions in water usage at power plants. Digital twin technology supports predictive and prescriptive maintenance, while Advanced Asset Performance Management utilizes real-time data and analytics to optimize physical asset performance. Machine learning systems, integrated with surveillance cameras, provide advanced warnings for real-time intervention, helping prevent operational mishaps. A robust Manufacturing Execution System (MES) offers full visibility into critical plant operations, enabling remote decision-making and improved process control.

To further reduce emissions, several manufacturing and logistics measures have been adopted. Electric forklifts are deployed across operations, complemented by EV garbage collectors in townships. At Jharsuguda, India's largest EV forklift fleet has been introduced, marking a significant shift in transport and fuel usage. The supply chain has been expanded with the addition of a Bogey Tank for Alumina Powder (BTAP) rake, and rail transport is increasingly used over road to reduce Scope 3 emissions. Additionally, natural gas is being adopted as a cleaner fuel alternative to coal, lowering the overall emissions intensity of operations.

Switching to Cleaner Energy & Energy efficient technologies

Risk Description

The aluminium industry's shift to low-carbon production demands major capital investment in renewable energy, technology upgrades, and operational changes. Though vital for sustainability and compliance, the transition poses financial risks due to high upfront costs and potential disruptions, making it a challenging but necessary transformation.



Risk description in Current Policies

- India is committed to achieving its Net Zero target by 2070, with a strong focus on expanding renewable energy generation and reducing energy intensity. Supportive policies are driving down the Levelized Cost of Electricity (LCOE), making renewables increasingly competitive with fossil fuels. This shift is creating an environment where energy efficiency becomes essential for aluminium manufacturers to reduce electricity costs, carbon credit purchases, and compliance expenses.
- Complementing these efforts, the Ministry of Coal and Mines' Aluminium Vision Document outlines a strategic roadmap to boost aluminium production, promote low carbon technologies, and double recycling, positioning India as a global leader in sustainable aluminium manufacturing.

Risk description in Net Zero 2050

- India is expected to undergo a transformative energy shift. LCOE may drop at higher rate in comparison to current policies scenario. NGFS states that the annual global investment in renewable electricity and storage reaches \$1.8 trillion by 2050—\$0.5 trillion above current policy levels—enabling renewables like solar, wind, hydro, and biomass to meet around 70% of India's primary energy demand. Globally, energy intensity may fall by nearly 60% between 2020 and 2050, driven by stringent sustainability measures, widespread adoption of low carbon technologies, and circular economy practices that significantly boost energy efficiency.

Impact

Capital intensive updating of technology for lower LCOE: To reduce the Levelized Cost of Electricity (LCOE) and enhance efficiency in onsite renewable energy generation—critical for energy-intensive smelting and refinery processes—adopting advanced technologies such as bifacial solar panels, AI-based predictive maintenance, TopCon, and HJT solar cells is essential which are more capital intensive

Increasing need to adopt energy efficient technologies: To stay competitive in the market there is need to adopt energy-efficient technologies which requires considerable capital investment and could result in stranded assets.

Adaptive Capacity

We have undertaken a wide range of measures to accelerate the adoption of renewable energy and reduce overall energy intensity across our operations. We plan to increase the renewable energy share to 30% in the total energy mix by 2030 with BALCO signing a 218 MW and Jharsuguda signing a 275 MW round-the-clock renewable power purchase agreement to support this transition. Waste heat recovery systems have been deployed to capture excess process heat and repurpose it for ore digestion, enhancing energy efficiency.

In smelting operations, energy-efficient pot lining designs and slotted anodes are used. A first-of-its-kind Fill-less Induced Draft Mist Cooling Tower has been commissioned, offering energy savings of up to 480 kWh/day per cell. At Jharsuguda,

one of India's largest electric forklift fleets is operational, with targets to decarbonize LMV and mining fleets by 2030 and 2035, respectively.

Further Hydro-jetting of airlift conveying pipes and pulse valve diaphragm replacements have improved equipment performance. Across key systems—flail, casting car, autogenous mill, scalping drum, screw conveyor, and furnace—IE3 and IE4 energy-efficient motors have been installed. LED replacements on shop floors and rooftops have lowered power consumption, while high-efficiency motors fitted to ball mills, compressors, and fans have further improved energy performance. Additional overhauls of compressors, cooling towers, and ETP units, along with HTM circuit temperature optimization continue to drive operational efficiency and support Vedanta's low-carbon transition.

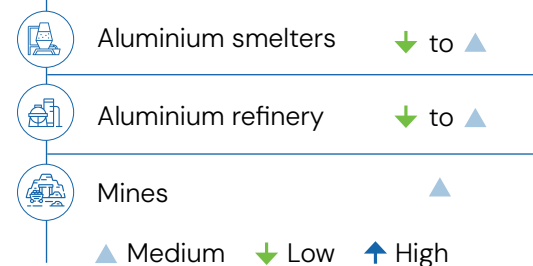
REPUTATION

Increasing awareness among stakeholders & investors

Risk Description

With rising global focus on sustainability, stakeholders demand environmental responsibility and transparency. Failure to meet evolving low-carbon expectations risks reputational harm, reduced investor confidence, and loss of competitiveness. Proactive engagement and strong climate disclosures are now essential for maintaining trust and securing long-term market value.

BU's impacted



Risk description in Current Policies

A strong shift toward sustainability is driving consumers and investors to favor eco-friendly aluminium businesses. Firms lacking environmental commitment or transparency risk reputational damage, reduced investor interest, and limited capital flow, as stakeholders increasingly prioritize companies with robust environmental credentials and responsible practices.

Risk description in NZE2050

Companies may face stricter emissions standards, potential penalties for non-compliance, and intensified public scrutiny. Transparency and commitment to carbon neutrality may become critical, as low carbon practices evolve into industry norms. Firms failing to adapt may risk losing investor confidence, market relevance, and competitive edge.

Impact

- To ensure compliance and operational continuity to evolving environmental standards and regulations, strategic investment is required in mitigation measures such as emission control systems and advanced waste management solutions.
- A market driven by transparency in emissions increasingly favours businesses committed to climate mitigation and environmental protection. Investor awareness demands clear disclosure, with non-compliance risking fines and reputational harm. Rapid decarbonization and proactive sustainability measures enhance investor confidence and improve access to finance, offering a competitive edge over peers.

Adaptive Capacity

We continue to take proactive and responsible measures to appeal to environmentally conscious customers and investors, while also minimizing the impact of our operations on surrounding communities. We ranked 2nd in the DJSI S&P Global Corporate Sustainability Assessment (CSA) 2024 for aluminium industries and earned a place in the S&P Global CSA Yearbook 2025, reflecting our leadership in sustainable development practices. To ensure transparency and accountability, we have adopted multiple reporting frameworks including DJSI, and publish our Annual Sustainability Report and TCFD disclosures to track progress and communicate our climate and ESG initiatives.

Our commitment to high standards is validated through certifications from globally recognized bodies such as



the Bureau of Indian Standards (BIS), Environmental Product Declaration (EPD), and the Aluminium Stewardship Initiative (ASI). Across all business units, we are actively adopting renewable energy, expanding low-carbon product lines, and investing in renewable energy projects to support climate-conscious manufacturing. In parallel, we engage with local communities through development programs focused on water conservation and livelihood support, ensuring inclusive and sustainable growth. To stay ahead of emerging sustainability challenges, we are also undertaking pilot studies of new technologies to evaluate their feasibility, cost-effectiveness, and scalability, reinforcing our commitment to innovation and responsible industrial transformation.

Likelihood of Transition risks under "Net Zero 2050" climate scenario

Risks assessed	Smelters (BALCO & Jharsuguda)			Refinery (Lanjigarh)			Mines (Jhamkhani)		
	2030	2040	2050	2030	2040	2050	2030	2040	2050
Emerging regulation & Emission disclosures	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High
Carbon pricing mechanism	Low to Medium	Medium to High	High	Low to Medium	Medium to High	High	Low to Medium	Medium to High	High
Change in consumer preference	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High
High dependency on coal	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High
Adoption of lower energy advanced technologies	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High	Low to Medium	Medium to High	High
Switch to cleaner energy & energy efficient technologies	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High	Low to Medium	Medium to High	High
Increasing awareness aiming stakeholders & investors	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High	Low	Low to Medium	Medium to High

Low ■ Low to Medium ■ Medium to High ■ High ■ Extremely High ■

Likelihood of Physical risks at our sites under "SSP5 8.5" climate scenario

Locations	Flood			Cyclone			Heat stress			Water stress		
	2030	2050	2100	2030	2050	2100	2030	2050	2100	2030	2050	2100
BALCO	High	High	High	Low	Low to Medium	Low to Medium	High	High	High	Low to Medium	Low to Medium	Low to Medium
Jharsuguda	High	High	High	Low	Low to Medium	Low to Medium	High	High	High	Low to Medium	Low to Medium	Low to Medium
Lanjigarh	Low	Low to Medium	Low to Medium	Low to Medium	Low to Medium	Low to Medium	High	High	High	Low to Medium	Low to Medium	Low to Medium
Jamkhani Coal Mine	Low to Medium	Low to Medium	High	Low	Low to Medium	Low to Medium	High	High	High	Low to Medium	Low to Medium	Low to Medium
VGCB	Low	Low	Low to Medium	High	High	High	Low to Medium	Low to Medium	Low to Medium	Low to Medium	Low to Medium	Low to Medium

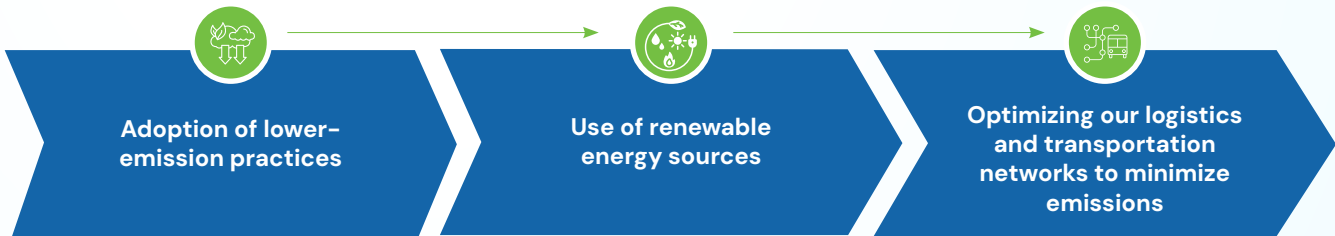
Low ■ Low to Medium ■ Medium to High ■ High ■ Extremely High ■

The criteria for aligning the low, medium high likelihood are as follows,
 • Floods: % increase in cumulative rainfall over 5 days in comparison to baseline of 2014 and the vulnerability to flash floods considering drainage density & run off potential
 • Heat stress: % increase in number of days of temperature above 40° C in comparison to baseline of 2014
 • Water stress: renewable water resource demand and availability
 • Cyclones: The projected wind speeds and historical data of occurrences of cyclones in terms of cyclonic speeds & frequency.

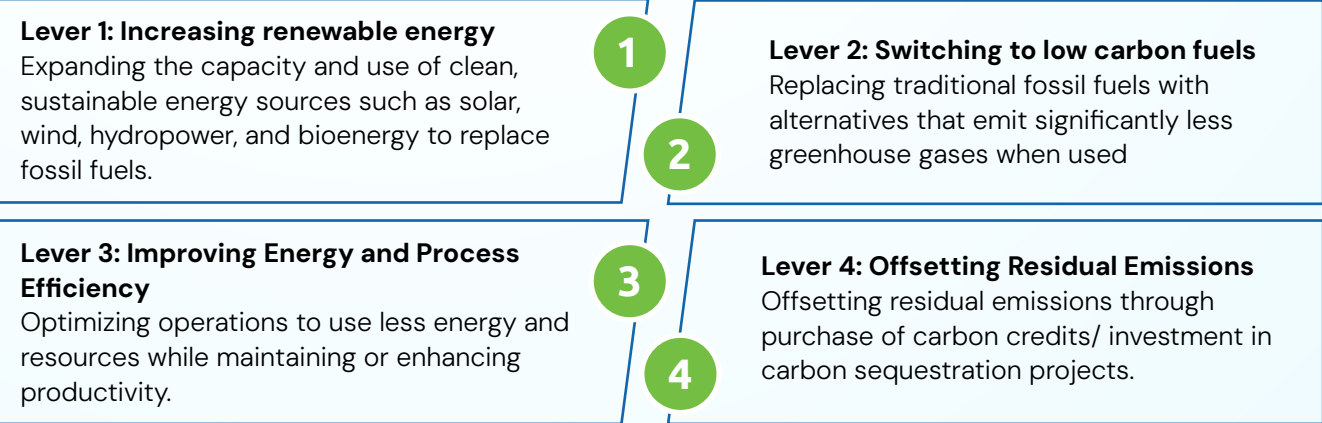
Climate Resilience Strategy

As part of adaptive capacity towards climate risk, we have adopted a comprehensive carbon management plan that integrates sustainability across the value chain. This strategy is anchored on three core pillars: building a responsible and resilient upstream supply chain, accelerating the decarbonization of our own operations, and delivering low-carbon product offerings to meet evolving market expectations.

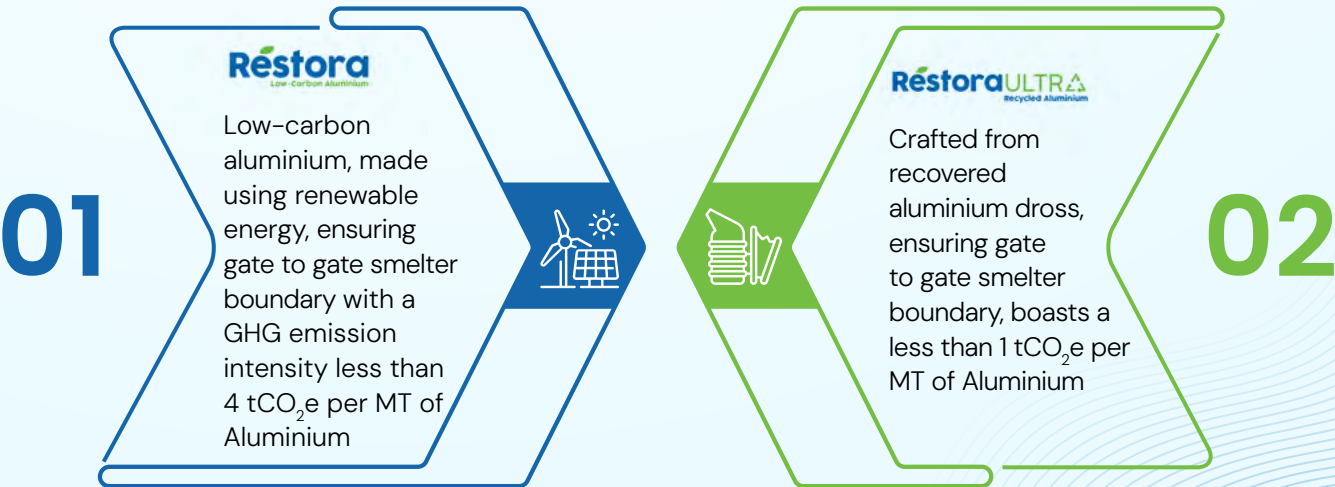
Sustainable Upstream Supply Chain



Decarbonizing own operations



Low Carbon Aluminium Brands



Results of our Climate Risk Assessment

We've identified medium to high climate-related risks—driven by extreme heat, cyclonic disruptions to port operations, and coal dependency—across our operations. In response, we've implemented robust mitigation and adaptation measures under a climate risk strategy focused on decarbonisation and long-term resilience.

To assess net vulnerability, we calculated the Residual Climate Risk Score (RCRS) by subtracting our Adaptive Capacity Score from the Climate Risk Score. This highlights where risks exceed current resilience, guiding targeted interventions, resource allocation, and transparent stakeholder engagement. It also supports investment prioritization and tracks adaptation effectiveness.

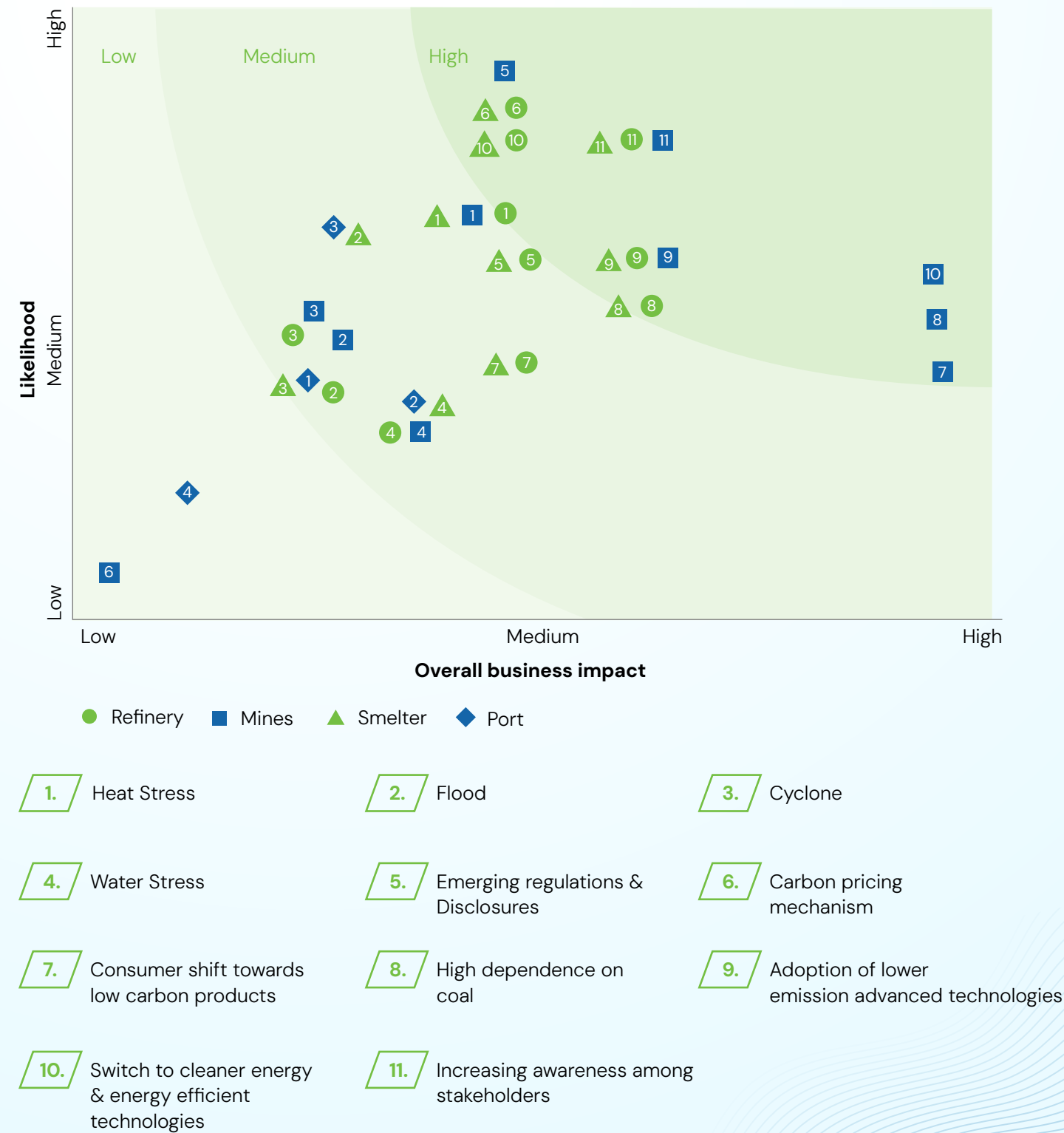
Risks	Risk score	Adaptive Capacity	Residual Risk
Extreme Heat	Medium to High	Low	High
Flood	Medium to High	Low	High
Cyclone	Medium to High	Low	High
Water Stress	Medium to High	Low	Medium
Emerging regulation & Emission disclosures	Medium to High	Low	Medium
Carbon pricing mechanism	Medium to High	Low	Medium
Change in consumer preference	Medium to High	Low	Medium
High dependency on coal	Medium to High	Low	High
Adoption of lower emission advanced technologies	Medium to High	Low	High
Switch to cleaner energy & energy efficient technologies	Medium to High	Low	Medium
Increasing awareness aiming stakeholders & investors	Medium to High	Low	Medium

Low Low to Medium Medium Medium to High High



Materiality matrix of all assessed climate risks

The Materiality Matrix is representation of the likelihood and impact for all physical and transition risks assessed considering the existing mitigation and adaptation measures undertaken at all sites. High zone of the Materiality Matrix represents high adaptation priority for the risk.



Mitigation and Adaptation Plan

To build resilience in a changing climate, we’re not just reacting—we’re designing a proactive roadmap. The table below outlines a set of suggested measures aimed at mitigating identified climate risks and their potential impacts across short-, medium-, and long-term horizons. Each proposed initiative is intended to strengthen adaptive capacity, minimize hazard exposure, and reduce the severity of impacts, thereby lowering our residual risk score and enhancing overall climate resilience.

	Short term	Medium Term	Long term
Strategy to mitigate risk and impact			
Business Disruption due to extreme weather events like floods, cyclones	Flood Assessment and Preparedness: Conduct flood vulnerability assessments if required. Engage insurers for parametric flood insurance at smelters and refinery sites. Regularly review and update flood emergency SOPs, complemented by mock drills to ensure workforce readiness.	Strategic Relocation of Critical Storage Relocate critical material storage to elevated or flood secure zones, identified as per the flood vulnerability assessment findings. Structural resilience: Strengthen warehouses to endure strong winds and retrofitting with impact-resistant glass and storm shutters designed for Category 1 cyclones. Assess the placement of permanent structures to divert excess runoff from critical facilities Upgrade waste and tailing storage to lined and sealed systems to reduce flood related contamination risk.	
	Decrease in workforce productivity	Heat Stress management & Early Warning: Implement heat stress management programs with awareness training and standardize heat safety protocols through site-specific heat stress SOP developments. Expand deployment of sites weather monitoring station at all locations to track the climate related data (Wet Bulb Globe Temperature indicator, incorporating Temperature & Humidity). Review and update insurance policies to ensure adequate heat stress coverage for employees and in all business partner contracts.	Digital Monitoring & Smart Integration Deploy IOT based temperature monitoring integrated with HVAC for real time control. Explore possibility of digital solutions for tracking employee well being in high heat environment. Infrastructure Adaptation & resilience Exploring to adopt Passive Cooling & Heat-Resistant Infrastructure such as reflective roofing materials and architectural designs to reduce ambient heat load in work areas. Advance Process Automation to minimize human exposure in extreme heat processes.

	Short term	Medium Term	Long term
Strategy to capitalize opportunities			
Emerging Regulations – Emissions & Disclosure Related.	Ensure Compliance: Continuously monitor evolving legislation and reporting mandates to avoid fines and build stakeholder trust.	Promote Circular Economy: Invest in R&D for sustainable manufacturing and increase recycled aluminium usage.	Focus on low carbon Products: Aim for production of low carbon aluminium as major product by using renewable energy and scrap/used aluminium as a raw material.
	Verify Emissions: Conduct quarterly audits and continue third-party verification aligned with GHG Protocol for credible climate reporting.	Enhance Carbon Pricing Strategy: Develop a digital compliance tool and assess internal carbon pricing rates against industry benchmarks.	
	Advance Decarbonization: Track and update decarbonization plans annually, prioritizing actions using marginal abatement cost analysis.	Strengthen Supplier ESG Alignment: Evaluate vendors on ESG criteria to support Scope 3 emissions reduction.	
Change in consumer preference	Expand production of Low-Carbon Aluminium: Continue to develop and promote aluminium products with verified low-carbon footprints.	Identify Eco-Conscious Segments: Pinpoint and prioritize customer groups that value sustainability, such as low carbon construction firms, EV manufacturers etc	Closed-Loop Recycling Partnerships: Establish closed-loop recycling systems with key customers to retain material value and capture a significant share of the low carbon aluminium market.
	Sustainability-Focused Campaigns: Launch targeted marketing initiatives that emphasize the environmental benefits of low-carbon aluminium to attract eco-conscious customers and investors.	Tailor Contracts for Sustainability Buyers: Customize product offerings, pricing models, and long-term contracts to meet the needs of buyers focused on reducing their environmental impact.	Aluminium Scrap Take-Back Programs: Launch initiatives to collect and recycle aluminium scrap from customers, reinforcing circular economy leadership and reducing raw material dependency.

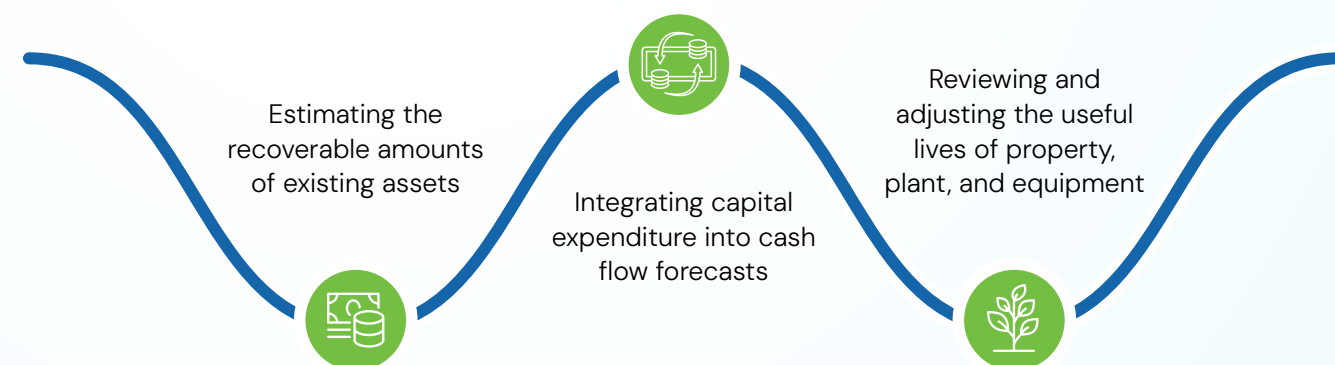
	Short term	Medium Term	Long term
Strategy to capitalize opportunities			
Switching to Cleaner Energy & Energy efficient technologies	Renewable Energy Development: Explore and pursue all viable opportunities for generating renewable energy to reduce reliance on grid power and lower carbon emissions.	2030–2040 Adoption Window: Prioritize maximum expansion of renewable energy adoption during 2030–2040, when capital costs for solar panels and wind turbines are projected to decline most significantly.	Expand Beyond Solar & Wind: Diversify renewable energy sources by incorporating biomass, hydrogen, and other alternatives that offer greater stability and are less exposed to price fluctuations.
		Long-Term Renewable PPAs: Secure long-term Power Purchase Agreements (PPAs) to ensure stable, clean energy supply and cost predictability.	Predictive Maintenance Tools: Implement advanced digital tools for predictive maintenance and real-time energy optimization to enhance operational efficiency and reduce downtime.
Increasing awareness among stakeholders & investors	Community Impact & CSR Outreach: Continue conducting impact assessments and expand CSR initiatives to strengthen local relationships.	Transparency for Sustainable Financing: Leverage transparent ESG disclosures to access sustainable financing and appeal to ESG-focused investors.	Framework & Scenario Analysis: Continuously assess and update climate risk frameworks and conduct scenario analyses to prepare for evolving environmental and regulatory challenges.
		Climate-Resilient Identity: Strategically position and campaign the the Aluminium Sector as a climate-resilient, transparent, and socially responsible leader to strengthen stakeholder trust and market reputation.	



Financial Impact of Climate Change

Incorporating Climate-Related Risks into Asset Valuation and Financial Estimates

We incorporate climate-related factors—including both physical and transition risks—into our assessment of expected useful lives and residual values of assets. Climate change can significantly affect the valuation of assets and liabilities by altering estimated future cash flows. In preparing our financial statements, we consider several key climate-related aspects:



Overview of Climate-Driven Capital Investments and Associated Operational and Strategic Impacts



Investments in Low-Carbon and Circular Solutions

- ▶ Investing in innovative technologies that reduce carbon emissions
- ▶ Piloting reuse/recycling initiatives for operational waste
- ▶ Implementing projects to reclaim flood-prone, water-risk areas



Emission Reduction Initiatives

- ▶ Significant capex allocated to meet GHG reduction targets
- ▶ Enhancing integration of renewable energy in operations, requiring substantial capital investment



Internal Carbon Pricing

- ▶ Introduced an internal carbon price into capex approval processes
- ▶ Driving investment in clean technologies, low-carbon innovations, and renewable energy
- ▶ Applied across operations and the supply chain to reinforce sustainability-focused capital decisions

Risks driven by change in physical climate parameters or other climate-change related developments

Our climate risk assessment identified site-specific vulnerabilities based on geography and environmental exposure, with financial impacts estimated across CapEx, OpEx, disruptions, asset damage, and efficiency losses.

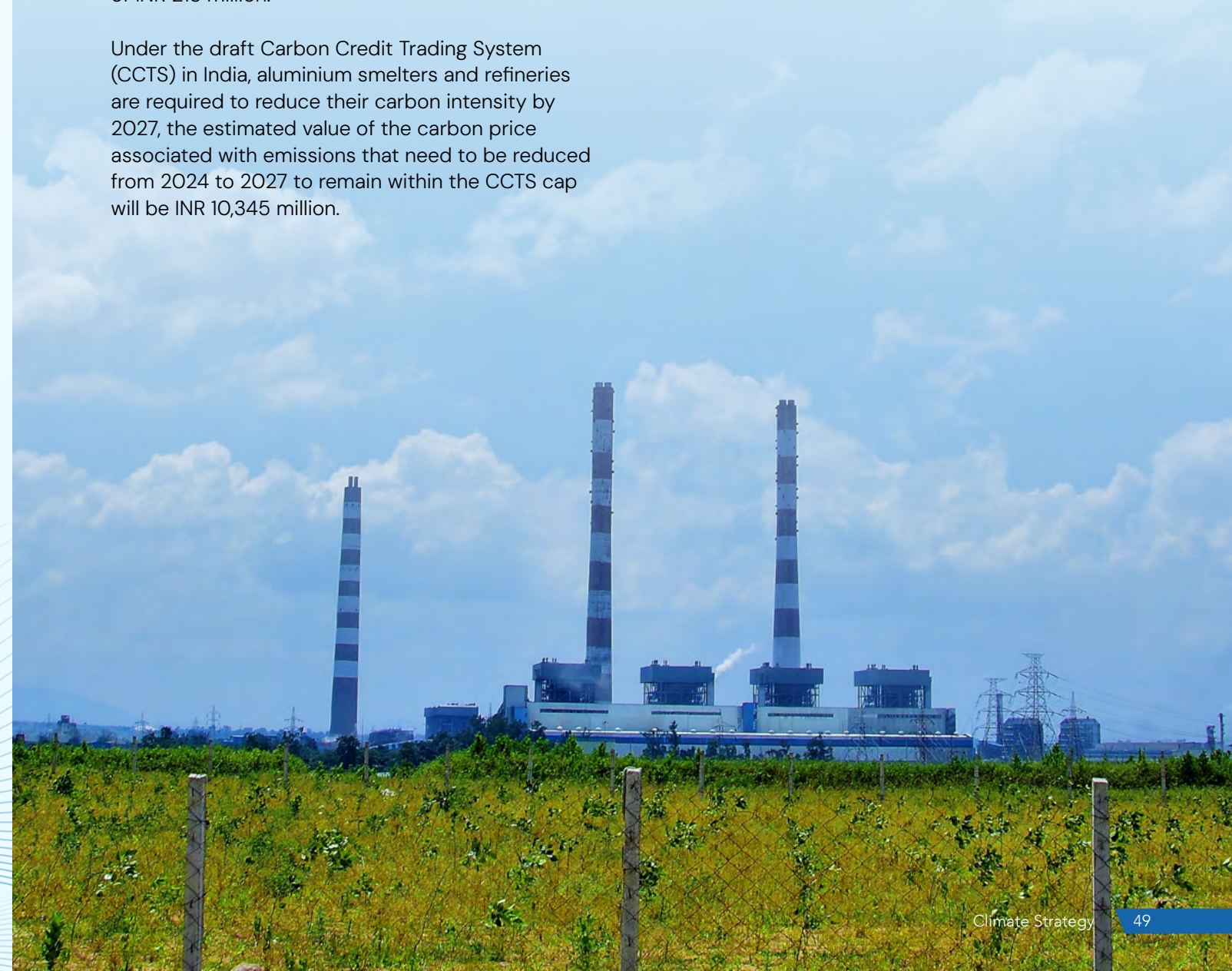
CIMP6 projections aligned with IPCC data show rising extreme heat days across five sites. Due to high employee concentration Jharsuguda faces the most exposure leading to reduced efficiency and higher absenteeism, estimating a financial impact of INR 20 million per year. For adaptation to the increasing risk of extreme heat, we are installing rest rooms equipped with desert coolers, deploying ventilated headgear in high heat stress zones, upgrading technological vehicles with air-conditioned cabins for operators, and implementing advanced ventilation louvers to improve airflow and comfort with an estimated cost of INR 213 million.

Under the draft Carbon Credit Trading System (CCTS) in India, aluminium smelters and refineries are required to reduce their carbon intensity by 2027, the estimated value of the carbon price associated with emissions that need to be reduced from 2024 to 2027 to remain within the CCTS cap will be INR 10,345 million.

In response to the CCTS requirement we have already signed agreement for RE RTC of 493MW with an estimated cost of INR 29,712 million and have plan of increasing the RE RTC to 1,500 MW by FY 30.

Financial Opportunities Arising from Climate Change

Between the medium and long term, in a Net Zero scenario, the levelized cost of electricity for solar and wind-based renewable energy is expected to drop drastically. We are tapping into the opportunity to adopt renewable energy for producing low-carbon aluminium, and this is a key lever to achieve decarbonization with an investment of INR 19,343 million. As the carbon price of the emissions reduced by this initiative is estimated to have a positive financial implication of INR 6,305 million per year.





Risk Management

Climate Risk Integration in Enterprise Risk Management

At Vedanta Aluminium, climate change is addressed as a strategic priority woven into the fabric of our governance and risk management systems. Our enterprise risk management (ERM) framework serves as a structured platform to evaluate climate-related risks across financial, operational, technological, and ESG dimensions. With a focus on clarity and effectiveness, we integrate climate risk assessments across all business functions, enabling consistent visibility and accountability. Our governance model fosters strategic alignment at every level—driven by leadership oversight and empowered by operational insight. Regular engagement by the Board ESG Committee ensures that climate resilience remains central to our decision-making processes.

Governance Integration

Climate risks are governed at the highest organisational levels, with clear lines of oversight and accountability. The ESG Committee of our Board of Directors oversees our climate strategy, ensuring alignment with our long-term target of achieving Net Zero Carbon by 2050 or sooner.

Financial Integration

ESG performance is a mandatory KPI for all senior leaders and employees, reinforcing our commitment to responsible operations. Our scorecard-based framework links risk performance directly to annual evaluations and compensation, with a minimum score of 70% in the Vedanta Sustainability Assurance Programme (VSAP) Audit required to activate bonus payouts. Line managers play a pivotal role in translating risk principles into everyday decision-making. They are equipped with clear guidance on the Company's values and actively participate in risk initiatives. Regular training sessions are conducted across the organisation to build awareness and strengthen capabilities. The Human Resources team monitors performance against risk criteria, integrating climate risk reporting into annual assessments. Risk management standards are also embedded into product development, ensuring resilience is considered at every stage of innovation.

Supplier Screening and Climate Risk Alignment

At Vedanta Aluminium, our supplier screening process is designed to uphold environmental integrity while actively contributing to climate risk management. We assess suppliers on their compliance with statutory environmental norms and their alignment with climate transition priorities. This includes evaluating energy consumption, greenhouse gas emissions, waste handling practices, and readiness to adopt low-carbon technologies. Suppliers are encouraged to demonstrate progress in renewable energy integration, resource efficiency, and transparent environmental reporting. By embedding climate-related criteria into our procurement strategy, we ensure that our supply chain supports our Net Zero ambition and strengthens our resilience against climate-related risks.

Climate Risk Management

We follow a structured and forward-looking approach to identifying and managing climate-related risks, encompassing both physical and transition dimensions. Physical risks include immediate threats such as extreme weather events—cyclones, floods, and heatwaves—as well as long-term challenges like rising temperatures and water stress. Transition risks arise from evolving policy landscapes, market dynamics, technological advancements, and stakeholder expectations. These include developments such as carbon pricing frameworks, international regulations like the Carbon Border Adjustment Mechanism, shifts in consumer demand for low-carbon products, and innovations in energy systems.

This section presents our structured approach to identifying, evaluating, and managing climate-related risks. Our methodology is aligned with the disclosure principles outlined in IFRS S2 and the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

Process for Identifying and Assessing Climate-Related Risks

We maintain a continuous cycle of monitoring climate indicators, regulatory shifts, and industry trends to stay ahead of emerging risks. This is followed by in-depth analysis using advanced tools and scenario modelling to assess potential impacts across varied future pathways. Our scenario analysis incorporates two scenarios by IPCC SSP2 4.5 and SSP5 8.5, to evaluate both transition and physical risks under different temperature and policy trajectories. These scenarios help us understand how evolving policies, technological advancements, market dynamics, and societal expectations may influence our operations and strategic direction. We assess short-, medium-, and long-term implications across key business areas, including asset performance, supply chain resilience, and financial exposure. The insights gained are embedded into financial planning—informing asset valuations, cash flow projections, and investment decisions—to reinforce long-term resilience. Our assessment methodology combines internal evaluations with scenario modelling based on IPCC pathways and industry-leading practices, enabling a holistic understanding of climate risks and their potential impact on our operations and support risk prioritization.



Metrics & Targets

To drive measurable progress on our climate commitments, we have embedded a robust framework of metrics and targets across our operations. These indicators serve as critical tools for tracking emissions performance, evaluating climate-related risks, and guiding strategic interventions. Our targets are designed not only to align with our Net Zero Carbon by 2050 or sooner ambition but also to reflect sectoral benchmarks and regulatory expectations. By continuously refining our measurement systems and setting ambitious yet achievable goals, we ensure that climate action remains integrated into our business strategy, operational planning, and long-term value creation.

Our Ambitions

GHG Emissions

Net Zero Carbon by **2050** or sooner

Endeavour to reduce Scope 1 & 2 GHG intensity (Aluminium business) by **28%** from FY 21 baseline by **2030**

Endeavour to reduce Scope 3 emissions intensity by **25%** from FY 22 baseline by **2030**

Renewable Energy

Increase the share of renewable energy consumption by **30%** by **2030**

Endeavour to install and use **1500 MW** renewable energy through PPAs by **2030**

30% share of low-carbon aluminium (Restora and Restora Ultra) in product portfolio by **2030**

GHG Emissions and Energy Consumption

Scope 1 emissions (tCO₂e)*

Business	FY 22	FY 23	FY 24	FY 25
BALCO	9,314,128.00	8,274,647.00	9,137,379.00	9,215,942.10
Jharsuguda	22,572,901.00	20,146,719.00	23,330,609.00	24,518,792.00
Lanjigarh	1,785,313.00	1,856,600.00	1,719,740.00	2,227,575.98
Jamkhani Coal Mine	-	-	-	-
VGCB	-	-	-	1,227.33
Total	33,672,342.00	30,277,966.00	34,187,728.00	35,963,537.76
BALCO IPP	2,253,649.00	883,555.00	3,246,024.00	3,438,834.22
Jharsuguda IPP	1,928,570.00	3,019,857.00	2,753,860.00	2,294,209.84
Total	4,182,219.00	3,903,412.00	5,999,884.00	5,733,044.06
Total	37,854,561.00	34,181,378.00	40,187,612.00	41,696,581.82

* Scope 1 calculations include the following greenhouse gases: CO₂, CH₄, N₂O, NF₃, SF₆, HFCs and PFCs emissions.

Scope 2 emissions (tCO₂e)*

Business	FY 22	FY 23	FY 24	FY 25
Aluminium				
BALCO	161,540.00	536,280.00	159,903.00	193,501.75
Jharsuguda	2,031,140.00	5,638,230.00	2,742,953.00	1,999,680.59
Lanjigarh	4,856.00	22,443.00	10,897.00	22,159.76
Jamkhani Coal Mine	-	-	-	523.79
VGCB	-	-	-	8,070.93
Total	2,197,536.00	6,196,953.00	2,913,753.00	2,223,936.82

*Scope 2 calculations include the following greenhouse gases: CO₂, CH₄, N₂O, NF₃, SF₆, HFCs and PFCs emissions.

Scope 3 emissions (tCO₂e)

Business	FY 22	FY 23	FY 24	FY 25
Aluminium				
BALCO	1,833,349.00	1,991,987.00	1,765,377.00	1,481,106.14
Jharsuguda	5,005,929.00	5,567,124.00	5,236,182.00	5,245,583.33
Lanjigarh	540,241.00	542,966.00	816,464.00	1,164,115.69
Jamkhani Coal Mine	-	-	-	821,275.21
VGCB	-	-	-	5,385.32
Total	7,379,519.00	8,102,077.00	7,818,023.00	8,717,465.69

Category-wise Scope 3* for FY 25 (tCO₂e)

Scope 3 Categories	BALCO	Jharsuguda	Lanjigarh	Jamkhani Coal Mine	VGCB	Total
Category 1: Purchased goods and Services	947,654.46	4,068,183.22	246,183.00	813,165.1	2,147.57	6,077,333.31
Category 3: Fuel- and Energy-related categories	318,747.43	860,273.70	610,760.86	233.57	3,004.53	1,793,020.09
Category 4: Upstream transportation and distribution	92,063.87	74,503.85	281,984.07	-	-	448,551.79

*The top 3 categories of our Scope 3 emissions i.e., category 1,3 and 4, account to more than 95% of our scope 3 emissions as per the baseline of FY 22.

GHG Emissions Summary (tCO₂e)

GHG Emissions	FY 22	FY 23	FY 24	FY 25
Scope 1	37,854,561.00	34,181,378.00	40,187,612.00	41,696,581.82
Scope 2	2,197,536.00	6,196,953.00	2,913,753.00	2,223,936.82
Scope 3	7,379,519.00	8,102,077.00	7,818,023.00	8,717,465.69
Total	47,431,616.00	48,480,408.00	50,919,388.00	52,637,984.33

Scope 1 + 2 Emissions Intensity (tCO₂e/MT)

FY	BALCO*	Jharsuguda*	Lanjigarh
FY 22	16.28	14.59	0.91
FY 23	15.56	14.99	1.01
FY 24	16.18	14.62	0.96
FY 25	16.04	14.49	1.11

*Excluding IPP

Scope 3 Emission Intensity (TCO2e /MT of Aluminium)

Particulars	FY 22	FY 23	FY 24	FY 25
Scope 3 Emission Intensity*	3.25	3.54	3.31	3.61

*During FY 25, we have incorporated Jamkhani Coal Mine and VGCB in our reporting boundary resulting in an increase in Scope 3 emissions intensity.

Scope 1,2 & 3 Emission Intensity of all the business units have been recorded individually, however in scope 3 of Smelters considering Alumina Refining including Lanjigarh and Coal Mining including Jamkhani in Category 1,3 & 4.

Our Energy Profile- Aluminium Business

FY	BALCO	Jharsuguda	Lanjigarh	Jamkhani Coal Mine	VGCB	Total
Renewable Energy Consumption (MWh)						
FY 24	237,118.00	1,056,000.00	1,541.00	-	-	1,294,659.00
FY 25	229,603.64	1,336,417.96	4,004.53	-	-	1,570,026.13
Non-Renewable Energy Consumption (MWh)						
FY 24	24,997,684.00	63,886,444.14	5,547,402.00	-	-	94,431,531.14
FY 25	25,197,634	66,593,192	7,099,728	654.25	16,502.07	98,907,710.30
Total Energy Consumption (MWh)						
FY 24	25,234,802.00	64,942,444.14	5,548,944.00	-	-	95,726,190.14
FY 25	25,427,237.64	67,929,610	7,103,732.53	654.25	16,502.07	100,477,736

FY	BALCO	Jharsuguda	Lanjigarh
Energy Intensity (MWh / MT)			
FY 24	14.62	14.30	2.02
FY 25	14.41	14.22	2.62

Our Energy Profile- Power Sector

FY	BALCO IPP	Jharsuguda IPP	Total
Total Energy Consumption (MWh)			
FY 24	9,878,404.00	8,347,034.00	18,225,437.75
FY 25	10,465,206.00	6,942,259.36	17,407,466.00

Water

Water Withdrawal and Consumption (million m³)

	BALCO	Jharsuguda	Lanjigarh	Jamkhani Coal Mine	VGCB	Total
Water Withdrawal						
FY 22	30.03	72.01	5.45	-	-	107.48
FY 23	25.04	64.89	6.26	-	-	96.19
FY 24	30.38	63.53	5.20	-	-	99.10
FY 25	31.14	57.46	8.24	0.24	0.18	97.26
Water Consumption						
FY 22	30.03	48.43	5.45	-	-	83.91
FY 23	25.04	46.19	5.51	-	-	76.73
FY 24	30.28	50.65	4.32	-	-	85.25
FY 25	28.66	55.41	5.26	0.24	0.14	89.56

*The difference between water withdrawal and water consumption reflects losses due to leakages in the distribution system.

The water is withdrawn from Hirakud reservoir for Jharsuguda, Kesinga river for Lanjigarh and Hasdeo river for BALCO. Hirakud and Jharsuguda are low water stress areas (<10%). Lanjigarh and BALCO lie in high water stress category (40-80%) as per WRI Aqueduct Tool.

Water Recycled in FY 25 (m³)

Water recycled	FY 25
BALCO	5.20
Jharsuguda	7.95
Lanjigarh	3.64
Total	16.79

Statement on Assumptions

Projecting future climate scenarios and understanding the drivers of climate change remains a complex and evolving task. While this analysis provides a framework to assess potential risks and opportunities, it is important to recognize that these projections are subject to change. Actual outcomes may diverge significantly from those outlined here due to the inherent uncertainty in forecasting. All forward-looking statements in this Report are based on current assumptions and are influenced by a range of dynamic global factors,

including political developments, environmental shifts, regulatory changes, market trends, technological progress, and economic conditions. As such, these projections should be interpreted with caution. Additionally, this Report is iterative in nature, shaped by current data limitations. It also highlights opportunities to strengthen scenario analysis and stress testing, which are critical to reducing uncertainty and supporting more informed decisions as we advance our decarbonization strategy.

Way Forward

We have undertaken a comprehensive and detailed climate risk assessment to evaluate the potential impacts of both physical and transition risks across our operations. This exercise has equipped us with valuable insights into climate-related vulnerabilities and opportunities, enabling us to make informed decisions for long-term resilience. Building on this foundation, we are committed to continuously strengthening our adaptation strategies and enhancing our resilience to climate-related hazards—ensuring our operations remain future-ready and sustainable. In parallel, we have set an aim to achieve Net Zero Carbon by 2050 or sooner. This target reflects our dedication to responsible growth and our role in supporting India's transition to a low-carbon economy.

To support this ambition, we have published our decarbonization roadmap in [Climate Action Report 2023](#) and we are currently enhancing decarbonization roadmap for aluminium sector with additional levers focusing on energy efficiency and the adoption of renewable energy solutions. Our approach includes deploying advanced technologies to optimise energy use, transitioning to cleaner energy sources, and exploring innovative solutions such as green hydrogen and carbon capture. These efforts are not only aligned with global climate goals but also reinforce our commitment to operational excellence, stakeholder value, and environmental stewardship. Through strategic investments, collaborative partnerships, and a culture of continuous improvement, we aim to lead the way in building a climate-resilient and low-carbon aluminium industry.







aluminium

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