



## TRANSFORMING THE PLANET

At Vedanta, we recognise our crucial role in addressing climate change and enabling a better and safer tomorrow. We are continually improving our practices to ensure that our operations and supply chain are more sustainable thereby setting benchmarks with pioneering initiatives around decarbonisation, circular economy, water positivity and increasingly efficient processes.

## Building a Climate-Resilient Future

**Aim 4:** Net-carbon neutrality by 2050 or sooner

**Governance:** Energy & Carbon CoP, Biomass Working Group

**Review Frequency:** Monthly

**SDG impacted:**



In FY 2022, Vedanta committed to decarbonise its operations and achieve net-carbon neutrality (net-zero carbon for Scope 1 & Scope 2 GHG emissions) by 2050 or sooner. Our GHG reduction strategy consists of four-levers, (i) Increasing the share of renewable energy, (ii) Switching to low-carbon or zero-carbon fuels, (iii) Improve the energy efficiency of our operations, and (iv) Offsetting residual emissions. In FY 2023, we have made progress in levers (i) – (iii). We only plan to purchase carbon offsets if we are unable to reduce our GHG emissions to target levels in 2030 and subsequently in 2050.

Our GHG reduction roadmap consists of 4 stages:

In stage 1 (FY 2021-FY 2025), we plan to reduce to GHG intensity (tCO<sub>2</sub>e/tonne) of our metals businesses by 20% by FY 2025 (from a FY 2021) baseline.

In stage 2 (FY 2021-FY 2030), we will deploy the renewable energy capacity to ensure that we will have 2.5 GW of Round-the-Clock renewable power by 2030.

In stage 3 (FY 2026-FY 2030), we anticipate a reduction in our absolute GHG emissions in line with our target to reduce our absolute GHG emissions by 25% by FY 2030 (from a FY 2021 baseline).

In stage 4 (beyond 2030), we aim to deploy emerging technologies at scale and expand our renewable energy capacities to become a net-zero carbon business by 2050.

**Note:** Due to significant capacity expansion projects underway, we anticipate that our energy consumption will increase, thus peaking our greenhouse gas (GHG) emissions around FY 2026-27.

In FY 2023, we initiated multiple measures to help achieve our mid-term targets. Over the past two years, our efforts have resulted in avoided emissions of 4.17 million tCO<sub>2</sub>e based on the FY 2021 baseline and 14.62 million tCO<sub>2</sub>e based on the initial FY 2012 baseline.

### Key Highlights, FY 2023

#### Lever 1: Increasing Renewable energy

By the end of FY 2023, Vedanta has signed 788 MW (RTC) renewable energy (RE) power delivery agreements (PDAs). Implementation of these PDAs will result in RE power consumption in operations increasing to ~ 6,900 million units, thereby avoiding 6.6 million tCO<sub>2</sub>e in the atmosphere per year. With this, we shall meet 32% of our RE target of using 2,500 MW of RE RTC (eq.) power by 2030. An RE Steering Committee has been set up to coordinate efforts between different business entities.

#### Lever 2: Switch to low-carbon/zero-carbon fuels

Transitioning from coal to biomass is the mainstay of our fuel switch strategy. Our goal is to substitute 5% of the coal used in thermal power plants with biomass, a net zero-carbon fuel. In FY 2023, we used ~78,000 tonnes of biomass in our operations, a ~4x increase over FY 2022 levels (18,000 tonnes), resulting in a 0.2% coal switch. The biomass working group is creating a 3-year roadmap to use 5% biomass in operations.

We have also made positive progress on reducing emissions from LMV and mining fleet, through electrification and other measures. HZL and ESL have initiated the use of electric vehicles. HZL has launched the first battery-powered electric underground vehicle and LNG-powered 55-tonne heavy-duty trucks. A large electric forklift fleet of 27 is operating at our Jharsuguda location. Biofuel trials have started at BALCO and VAL-Jharsuguda and planning is underway to start trials at Sterlite Copper and Sesa Value-Added Business (VAB).

#### Lever 3: Improving the energy and process efficiency of our operations

Our commitment to the plan drives our efforts towards energy efficiency and process improvement, which are areas of keen focus. In the pursuit of these goals, we have undertaken some major projects in the aluminium sector that are expected to boost our efficiency levels. Some of these projects include:

- 100% Graphitisation with copper inserted collected bar (potential 1 million tCO<sub>2</sub>e/year)
- Vedanta pot controller implementation (potential 0.2 million tCO<sub>2</sub>e)
- Commissioning of TRT and BPRT at ESL (potential 82,000 tCO<sub>2</sub>e/year)
- Natural gas usage at Lanjigarh Alumina Refinery (potential 1,20,000 tCO<sub>2</sub>e/year)

While these are projects under progress, there are some major energy efficiency projects we have completed at our sites:

- R&M of 1 unit of 600 MW at VAL Jharsuguda (3,70,000 tCO<sub>2</sub>e/year)
- VAL Lanjigarh Evaporation - 1 Calendria 1 and 2 tubes replacement (18,000 tCO<sub>2</sub>e/year)
- VAL Lanjigarh Boiler 2 junior APH replacement (16,000 tCO<sub>2</sub>e/year)
- ESL Fuel crushing index improvement (31,000 tCO<sub>2</sub>e/year)
- ESL LD gas recovery project completion (18,000 tCO<sub>2</sub>e/year)

**Lever 4: Purchasing carbon offsets for residual emissions**

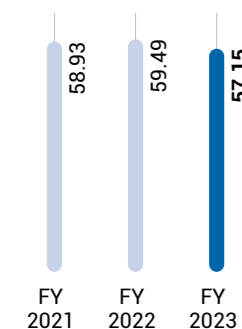
We have currently not initiated work on our fourth lever of GHG reduction i.e. carbon offset and will consider purchase or investment options for residual/hard-to-abate GHG emissions at the end of our target period.

**FY 2023 Key Achievements**

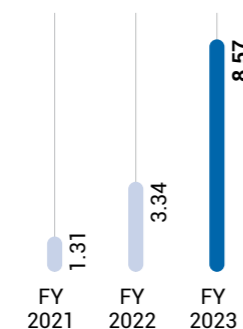
- 439 MW of New RE RTC PDAs signed in FY 2023 taking the total to 788 MW RE RTC till FY 2023
- 2 billion units of RE power consumption
- Biomass usage ~78,000 tonnes
- Introduction of battery vehicles in HZL, biodiesel trials at BALCO/VAL Jharsuguda
- Introduction of an Internal carbon pricing (ICP) across all businesses
- Introduction of EV policy for our employees

**FY 2023: Emission Performance**

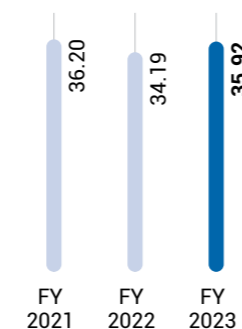
Scope 1 Emissions



Scope 2 Emissions



Scope 3 Emissions



**Absolute GHG Emissions:** Our Scope 1 & Scope 2 GHG emissions have increased marginally by 4.6% increase from last year, however, our combined Scope 1, 2, & 3 emissions have flat-lined compared to FY 2022. As mentioned above, we anticipate a reduction in our Scope 1 & 2 GHG emissions after FY 2026.

**GHG Intensity:** We are on track to achieve a reduction in the GHG intensity of our metals business by 20%. In FY 2023, we were able to achieve a reduction of 3%.

**Scope 3 targets:** Currently, we do not have Vedanta-wide reduction targets for our Scope 3 GHG emissions. These will be finalised in FY 2024. However, two of our businesses have taken Scope 3 reduction targets:

1. HZL has the target of reducing scope 3 emissions by 20% by 2027 over the 2017 baseline
2. Aluminium sector has taken the target of a 25% reduction in scope 3 emissions over the 2021 baseline

**Internal Carbon Price (ICP):** Vedanta has set an Internal Carbon Price of US\$15/tCO<sub>2</sub>e. This is a shadow price that will be deployed for any project that has a budget of ₹50 million or more. We also have BU-specific ICPs.

**Financing our Net Zero transition:** As part of its net-zero commitments, Vedanta aims to spend US\$5 billion over the next decade. While the allocations

are still under planning, the goal is to spend more than 60% on increasing the use of renewable energy in our operations. The remaining 40% will be split almost evenly between energy efficiency, fuel switch, fleet decarbonisation, and carbon offset projects.

More details about Vedanta's decarbonisation strategy can be found in our FY 2023 TCFD Climate Change Report.

**Striving for a Water-Positive World**

**Aim 5:** Achieving Net Water Positivity by 2030

**Governance:** Water CoP

**Review Frequency:** Monthly

**SDG impacted:**



Vedanta defines net water positive impact as the ratio of Water Credit (water given back to natural water bodies) and Water Debit (water taken from natural water bodies). If the ratio is >1, then the site is said to be water positive. We have undertaken significant initiatives to progress towards becoming water positive, which has resulted in a 2% reduction in our overall water consumption in FY 2023 from FY 2021 baseline. Site-specific roadmaps are being developed, which involve identifying projects both within and outside our premises to improve our water positivity ratio.

To ensure consistency and accuracy in our calculations, we have also developed and approved standard operating procedures (SOP) related to water positivity.

**Giving back to the community**

We are creating rainwater harvesting and groundwater recharging projects for our communities to improve freshwater availability and retain biodiversity in the area. Almost 13% of our water-related projects are in these areas.

**RE-led water consumption reduction**

The increased usage of RE power in our operations at major locations like HZL, VAL Jharsuguda and BALCO are helping to improve our water positivity ratio. It has helped reduce coal power generation, which currently requires a large amount of fresh water.

**Key Highlights, FY 2023**

**Freshwater reduction**

We are banking on technology deployment across our sites to reduce freshwater usage through process improvement and recycling of wastewater. Out of our total water projects pipeline, 77% are focussed on reducing waste from operations as well as reusing wastewater in operations.

**Replacing fresh water with alternate sources**

We have resorted to alternative water sources like municipal wastewater and saline water or even harnessed the power of rainwater harvesting for usage in our operations. Nearly 10% of our projects are related to this lever.



Effluent Treatment Plant at Dariba Smelting Complex



Lanjigarh Operations

### FY 2023 Key Achievements

Improvement in water positivity ratio from ~0.51 to ~0.62 YoY

Four sites have attained water-positive status (HZL, IOB, Cairn India and BMM)

Site-wise detailed water study completed for each major site including long-term basin study for water availability (2030 and beyond)

Standard operating procedure prepared to calculate water positivity ratio

40+ water bodies restored by the aluminium sector

### Case study

#### Dariba Smelting Complex Digital mapping of water consumption

##### Problem statement

DSC was unable to get water consumption information across different plant areas due to design issues and the unavailability of digital flow meters. This led to inefficiency in operations, water usage and planning.

##### Solution

DSC joined hands with the start-up, Promethean Energy, to improve operational efficiency. The following measures were implemented:

- Centralisation of water flow data acquisition on a common platform

- Use of wireless hardware to acquire data from remote analogue flowmeters and fusing it with available online data, to get a clear picture of water generation and consumption

##### Impact

- Better understanding of water intake and consumption in different subunits amongst on-ground employees and leadership
- Clarity on focus areas
- Identification of areas and projects for consumption reduction, which will result in a targeted 2-3% water savings

## Enabling a Cleaner, Greener and Sustainable Tomorrow

**Aim 6:** Greener Business Model

**Governance:** Waste to Wealth CoP

**Review Frequency:** Monthly

**SDG impacted:**



A greener business model translates into efficient management of natural resources and improvement in the circularity of our business, reducing the impact of our operations on biodiversity besides evaluating new green business growth opportunities.

### Key Highlights, FY 2023

#### Circular business models

We are improving the circularity of our businesses by maximising utilisation of the high-volume-low-toxic (HVL) wastes generated in our operations.

In FY 2023, nearly 164% of our HVL wastes were reutilised. Fly ash, which forms the bulk of these wastes, saw 200% utilisation. Our goal is to ensure that by 2035, we utilise 100% of the generated waste and reduce to zero the legacy waste stored at our sites.

We are working with the cement industry to utilise operational waste as raw material and with the National Highways Authority of India (NHAI) to use the waste as substrate for road construction.

HVLs such as red mud contain traces of Rare Earth Minerals (REE) and Research and Development projects are underway to enable the economical extraction of these minerals. Trials are also underway to use this waste as an alternative to sand. We are collaborating with CSIR, CRRI, IIT Kharagpur, IMMT, and NITI Aayog on these projects.

#### Reducing biodiversity impact

During the year, we established the biodiversity baseline for our sites. This will help us to understand the impact of our operations on biodiversity and guide the actions to be initiated to achieve No Net Loss (NNL)/Net Positive Impact (NPI) impact in the long term. We can accordingly update our biodiversity management plan (BMP). In FY 2024, we intend to finalise actions and timelines to reach the No Net Loss state, to kickstart relevant actions on the ground.

### FY 2023 Key Achievements

29.8 million tonnes HVL waste utilisation (162% for FY 2024)

28.1 million tonnes utilisation for Fly Ash (203%)

Legacy waste reduced from 62 million tonnes to 45 million tonnes

Lab scale feasibility study completed with CSIR-Central Road Research Institute (CSIR-CRRI) for utilisation of red mud in highway construction

Biodiversity baseline study was completed for all sites



Bricks developed from Waste