

TCFD

R E P O R T
2 0 2 0

Task Force on Climate related
Financial Disclosures



Highlights of 2020

NEW ENERGY & CARBON POLICY



Commitment to substantially decarbonize by 2050
Adoption of Group-wide Carbon Vision

DECLARATION OF THE PRIVATE SECTOR ON CLIMATE CHANGE



Signatory at India CEO forum on Climate Change
Pledged to aid in achieving India fulfill its NDCs

END OF CYCLE



Committed to reduce our GHG intensity by 16% by 2020
(Baseline: 2012)
Reduced our GHG emissions intensity by 13.83% by the
end of 2020
Amounts to ~9 million tonnes in avoided GHG emissions

Transition Phase

Long-term planning is essential if we want to achieve our decarbonization commitments. As we close-out our cycle for our 2020 targets, we are hard at work to establish the roadmap for 2025 and 2030. In our last cycle, we were able to prevent nearly 9 million TCO₂e from entering the atmosphere. This was possible due to the strong focus on process efficiency measures.

In 2020, we have taken measures to set us on our way for the next course of our journey. We reconstituted the Carbon Forum – the company's apex body on climate strategy, revised our Energy & Carbon policy, established cross-functional working groups at each of our BUs, engaged with the Board's Sustainability Committee on Climate Change, and aligned ourselves with national commitments to reduce our GHG emissions.

In the next ten years our vision is to produce some of the lowest-impact metals and minerals on the planet in keeping with our overall vision of Zero Harm, Zero Waste, Zero Discharge. As we look to the future, we are exploring options to diversify our decarbonization strategies, including a focus on renewables, waste management, improved extractive practices, recycling, afforestation programs, and reducing emissions in our supply chain.

We look forward to updating our stakeholders on the next phase of our decarbonization

Table of Contents

FORWARD-LOOKING STATEMENT	4
NOTE FROM THE CHAIRMAN'S DESK	6
CEO STATEMENT	8
ABOUT THIS REPORT	9
ABOUT VEDANTA	10
Our Group Structure	10
Our Core Values	11
Our Purpose	11
OUR POSITION ON CLIMATE CHANGE	12
Our Commitment	12
Our Understanding	13
Our Approach on Carbon Management & Climate Change	14
Building Blocks of our Carbon Vision	16
Our Roadmap	17
GOVERNANCE	18
STRATEGY	22
Climate related risks to our business	22
Climate related opportunities to our business	24
Climate-related scenario analysis	25
Mitigation and adaptation strategies	26
METRICS AND TARGETS	30
Energy management	34
Solar	38
Wind	39
Hydro	39
FUTURE ROADMAP (PATH TO CARBON NEUTRALITY)	40
AWARDS & ACCOLADES	42

FORWARD LOOKING STATEMENT



This Report contains forward looking statements, including, but not limited to statements regarding trends in commodity prices and supply and demand for commodities; plans, strategies and objectives of management; potential global responses to climate change; regulatory and policy developments; the development of certain technologies; the potential effect of possible future events on the value of the Vedanta portfolio and the plans, strategies and objectives of management.

Forward looking statements may be identified by the use of terminology, including, but not limited to, 'intend', 'aim', 'project', 'see', 'anticipate', 'expect', 'estimate', 'plan', 'objective', 'believe', 'expect', 'may', 'should', 'will', 'would', 'continue' or similar words. Such statements address future expectations with regard to the performance of assets or financial conditions, or provide other forward-looking information. In particular, such statements which include, but are not limited to, statements which relate to Vedanta's mission, priorities, objectives, plans and goals. Only as of the date of this document do these forward-looking statements speak. The Company undertakes no obligation to update publicly, or release any revisions, to these forward-looking statements, to reflect events or circumstances after the date of this document, or to reflect the occurrence of anticipated events.

We intend to work constructively with the TCFD to develop good practices and standards for transparency.



NOTE FROM THE CHAIRMAN'S DESK



ANIL AGARWAL
CHAIRMAN,
VEDANTA
LIMITED

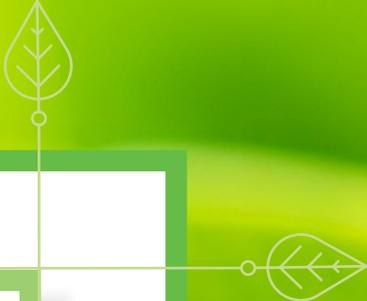
It gives me great pleasure and confidence to release Vedanta's first Climate Change Report in lines with the Taskforce on Climate-related Financial Disclosures (TCFD). Vedanta is a responsible mining and oil & gas company and our response to the climate crisis is an extension of our larger vision of "Zero Harm, Zero Waste, Zero Discharge".

I have committed that our business will substantially decarbonize its operations by 2050 and seek to become a net-zero carbon company subsequently. The company's Carbon Vision has given our managers a clear direction on the actions they need to take to help us meet this goal. These include evaluating zero-carbon energy for all our greenfield projects, procuring the most energy efficient equipment, setting a price on carbon, and ensuring that climate impact is assessed for every project.

With its portfolio of base metals like copper, zinc, aluminium, silver, and steel, I believe that Vedanta has a significant role to play in the emerging green economy. We plan to collaborate with global companies, SMEs, start-ups and academic institutions to develop innovative extractive practices, value-added products, energy storage and waste management solutions. We have established Innovation Cells at each of our Business Units and energy & sustainability are significant domains that these cells will influence. With Vedanta signing the "Declaration of the Private sector on Climate Change", I look forward to seeing our business help India become a carbon neutral nation.

Giving back to the nation and the community has always been important for Vedanta and as our carbon strategy matures, we will incorporate climate adaptation measures in our community programs. Our community interventions will start to account for the climate-related impacts so that local communities can build resilience as the climate changes.

Over the years, Vedanta has taken several steps to minimize our carbon footprint. We have reduced our GHG emissions intensity by nearly 14% from a 2012 baseline. This is equivalent to ~ 9 million tons in avoided GHG emissions. In the next five years, Vedanta will further reduce its GHG emissions intensity by 20% from a 2012 baseline.



“ With its portfolio of base metals like copper, zinc, aluminium, silver, and steel, I believe that Vedanta has a significant role to play in the emerging green economy. I look forward to seeing our business help India become a carbon neutral nation. ”

With the release of this report, I can see a new energy, focus, and an emphasis on technology & innovation that will result in minimizing its environmental & climate impact. I am excited to what the future holds and look forward to sharing our progress with you as it unfolds.

I congratulate my teams who are working relentlessly to achieve the collective organization goal to minimize impact on climate and environment by 2050.

I encourage you to engage with us on this topic as it is only through collective action that we will emerge successful.

ANIL AGARWAL

CHAIRMAN, VEDANTA LIMITED

CEO STATEMENT



SUNIL DUGGAL
CEO, VEDANTA LIMITED

Climate change poses a real and credible risk to our way of life on this planet. As a large consumer of fossil-fuel based energy, Vedanta acknowledges that concentrated and continuous efforts are needed to manage the size of the issue and to respond to its impacts. We also recognize the consequences of our energy consumption, both in terms of its climate impacts and operating costs, and are committed to fulfilling our energy needs while reducing our carbon emissions. Our Sustainable Development Framework includes an Energy and Carbon Policy, and an Energy and Carbon Management Standard. Our long-term strategy for addressing energy and climate change issues focuses on improving energy and process efficiency and diversification of our energy portfolio at all operations. We are aware that global concern on climate change can bring regulatory changes, operating / physical constraints and introduction of implicit and / or explicit carbon taxes in the host countries where we operate. This, along with evolving behaviour of the environmentally conscious consumers are some of the factors that may affect our business operations; positively or detrimentally.

Our organization remains supportive of the Paris Agreement and has taken on carbon reduction goals in line with the Government of India's Nationally Determined Contributions (NDCs). The group has adopted steps to reduce its GHG emissions in line with this objective. In FY2016-17, the organization committed to a 16 percent reduction in its GHG emission intensity from its 2012 baseline by 2020. We have achieved a reduction of 13.83 percent against the target as of FY2020. As part of India's CEO Forum on Climate Change, Vedanta has signed the Private Sector Declaration on Climate Change. This pledge contains several key commitments such as setting targets and priorities for achievable reduction of GHG emissions as well as energy efficiency improvement; implementing strategies for reducing GHG emissions and building climate resilience as part of a sustainable development strategy.

We agree with the recommendations made by the Task Force on Climate-related Financial Disclosures (TCFD). We intend to work constructively with the TCFD to develop good practices and standards for transparency. This will be a multi-year journey, but we have already started, and our first report provides information supporting the TCFD's recommended disclosures.

SUNIL DUGGAL
CEO, VEDANTA LIMITED

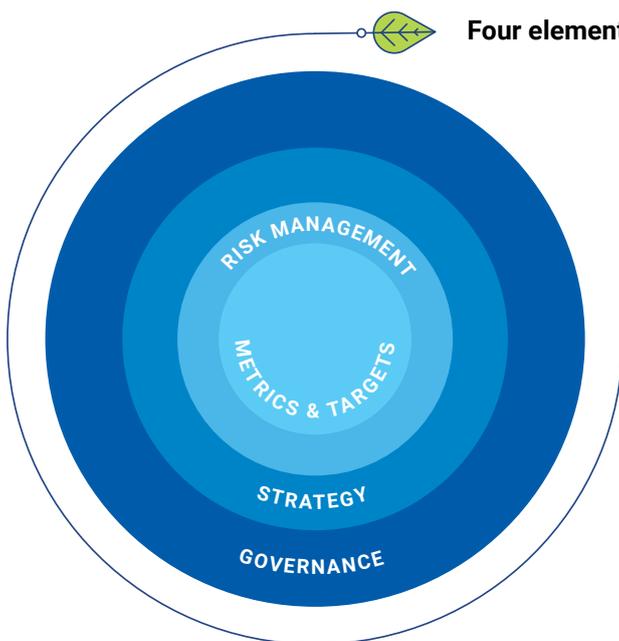


ABOUT THIS REPORT

Vedanta's first report on the impact of climate change on our business is in alignment with the recommendations made by the Task Force on Climate-related Financial Disclosures (TCFD).

Disclosure is one of the key building blocks of our carbon vision. In line with our vision, this report provides the overall thought process and future roadmap regarding our climate change actions. This is our very first TCFD disclosure and we will be focusing on improving our disclosure standards in future.

The boundary of this report covers all our operations and businesses in India, South Africa, Namibia, UAE, and Australia.



Four elements of recommended Climate-Related Financial Disclosures

Governance

The organization's governance around climate-related risks and opportunities.

Strategy

The actual and potential impacts of climate-related risks and opportunities on the organization's business, strategy and financial planning.

Risk Management

The process used by the organization to identify, assess and manage climate-related risks.

Metrics & Targets

The metrics and targets used to assess and manage relevant climate-related risks and opportunities.

Reprinted from "Implementing the Recommendations of the Task Force on Climate-Related Financial Disclosures" (June 2017)

ABOUT VEDANTA



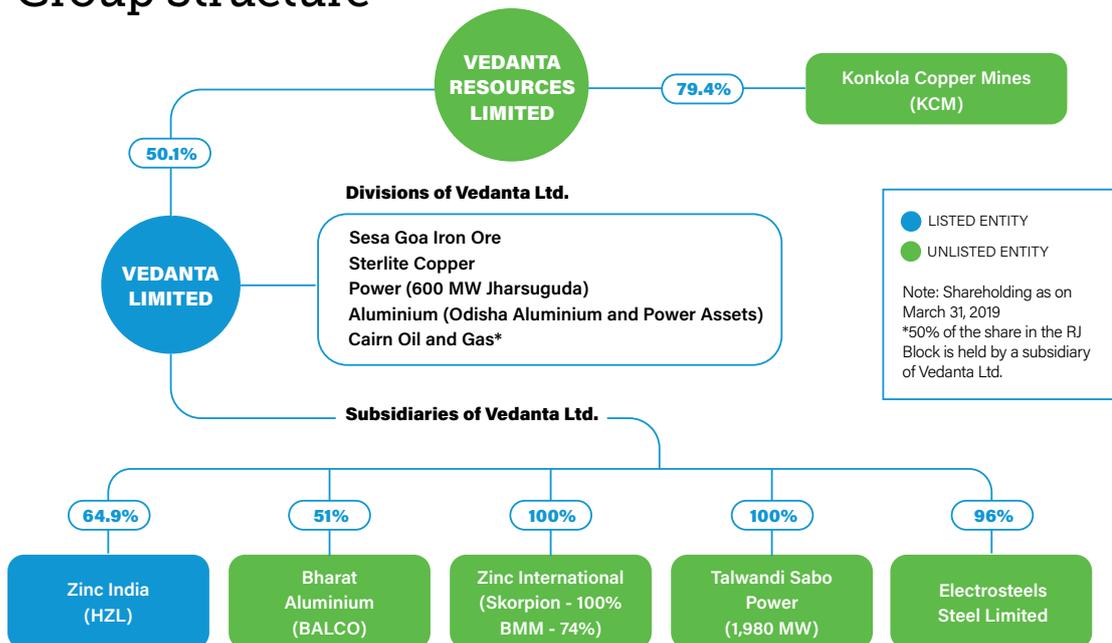
Vedanta Limited (Vedanta) is a diversified global natural resources company. The Group produces aluminium, copper, zinc, lead, silver, iron ore, oil & gas and commercial energy. Vedanta has operations in India, Namibia, South Africa, UAE, Australia and Ireland. One of the largest producers of these natural resources globally, we are headquartered in Mumbai, India. We strive to make a positive, all-round impact on the communities in which we operate, both as an employer and a contributor, and to leave a legacy of pride.

Our goal is to create long-term value for all our stakeholders through research, discovery, acquisition, sustainable development and utilisation of diversified natural resources. To accomplish that, we empower our people to drive excellence and innovation. We strive to demonstrate world-class standards of governance, safety, sustainability and social responsibility. Our core values **“Trust, Entrepreneurship, Innovation, Excellence, Integrity, Care, Respect”** help us achieve our purpose. They bind us and build our culture. They are at the heart of everything we do and achieve. At Vedanta, we understand the importance of working together in a team as we pursue growth and sustainable development.

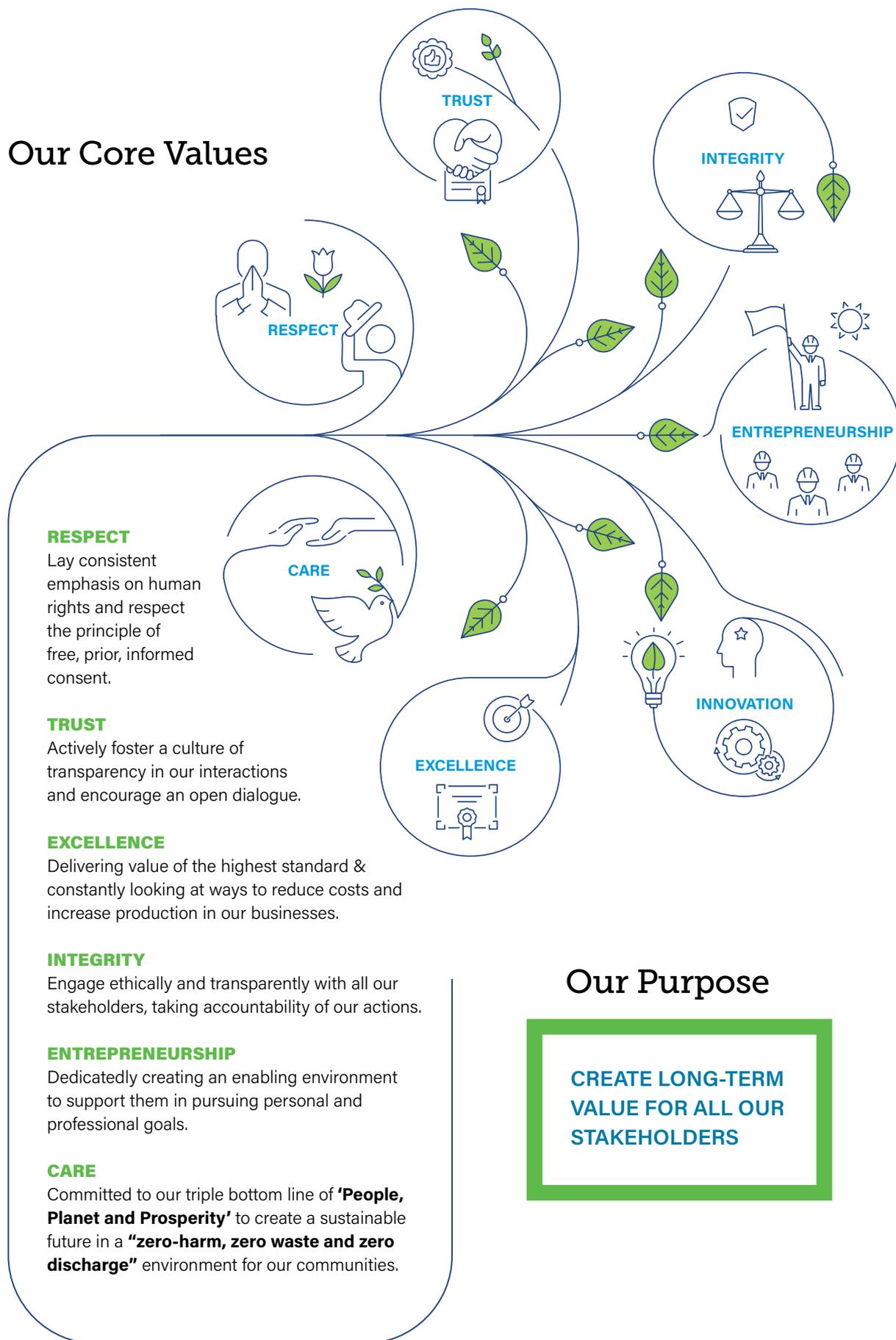
Spread across geographies, our facilities are focussed on all-round operational excellence to achieve benchmark performance across our business by debottlenecking our assets, adopting technology and digitalisation, strengthening people-practices, enhancing vendor and customer bases, optimising the spend base and improving realisations.

Our products: Aluminium, Copper, Iron Ore, Lead, Oil & Gas, Power, Silver, Steel, Zinc

Our Group Structure



Our Core Values



Our Purpose

**CREATE LONG-TERM
VALUE FOR ALL OUR
STAKEHOLDERS**

OUR POSITION ON CLIMATE CHANGE



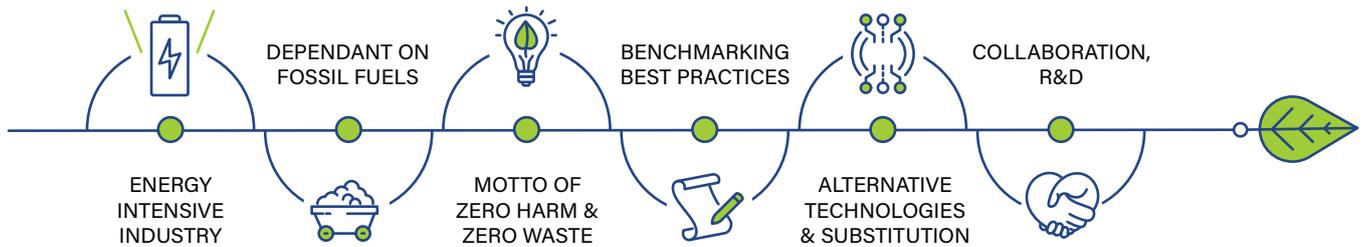
Our Understanding

- Global warming is unambiguous, evident and its physical consequences are imminent.
- The UN Paris Agreement on climate change calls for rapid action to decarbonise the global economy.
- Mining is currently responsible for 4 to 7 percent of greenhouse-gas (GHG) emissions globally.
- We remain fully supportive of the Paris Agreement on climate change to limit global warming to well below 2°C with an ambition to keep it below 1.5°C is the planet's best chance to avert the worst effects of climate change.
- As a diversified global resource company, we recognise the climate-related risks associated with our business activities.
- We believe that the metals & mining sector has a significant role to play in curbing GHG emissions as well as aiding the emergence and acceleration of a green economy.

Our Commitment

- Aligning with the vision of our company, we recognized the importance of climate change on our business and stakeholders around a decade ago.
- We have and will continue to remain committed to taking carbon reduction targets in alignment with the Nationally Determined Contributions (NDC) of the Government of India.
- We are committed to reducing our GHG emissions intensity by 20% by FY2025 from a 2012 baseline.
- Our vision is to produce some of the most low-impact metals and minerals on the planet in keeping with our overall vision of Zero Harm, Zero Waste, Zero Discharge. Addressing our GHG emissions is going to be a critical part of this vision.
- By 2050, we aspire to be a substantially decarbonize our organization by adapting several carbon mitigation and adaptation strategies and actions.

Our approach on Carbon Management & Climate Change



The metals and mining industry is inherently an energy intensive sector that requires large quantum of primary energy. In India, where we have most of our operations, the best way to fulfil this energy requirement is by accessing energy reserves available near our production sites. In most cases, for Indian industries, this primary energy source is coal. Coal is available in India in abundance, with sufficiently good Gross Calorific Value and is easy to transport and use in power stations, which provide electricity to Vedanta’s aluminium, copper, zinc smelter’s and refineries. All the major metal and mining industries in India use coal as a primary fuel to power their energy requirements.

While important for our current business operations, in light of the emerging climate crisis, Vedanta understands the need to decarbonize its business. Vedanta’s motto of zero harm and zero waste encapsulates our desire to operate our business by creating minimum waste and driving down our GHG emissions.



We routinely focus on improving our process efficiencies and have BU-wise energy efficiency teams in place, to help our operations reduce their energy consumption. Additionally, each BU has also constituted an Innovation Cell, which has a strong focus on reducing our energy and carbon footprint. A key aspect of the work being undertaken by the Innovation Cells and the Carbon Forum is to evaluate technologies that would allow for fuel substitution, major process modifications and large scale

adoption of renewable technologies as and when these technologies are commercially available for implementation.

Vedanta’s Energy and Carbon Management policy, Carbon Vision, and performance standard are the guiding documents for the organisation’s approach to mitigating our climate related business risk and ensuring that we minimise our energy consumption and GHG emissions.

CASE STUDY

Cairn's ongoing journey towards Zero Flaring

Diesel generators have been the traditional way to power remote satellite oil & gas wells. Given the marginal quantity of hydrocarbons produced, remoteness of the sites, and the relatively short lifespan of these wells, it has been financially unfeasible to set-up a permanent power infrastructure at these locations. As a result, the associated gas that is present alongside the primary hydrocarbon and is a by-product of the extraction process, is burnt-off in gas flares. Flaring of gas contributes to climate change and impacts the environment through emissions of CO₂, black carbon and other pollutants. It also wastes a valuable energy resource that could be captured for power generation"

Under the 'Zero Routine Flaring by 2030' initiative by World Bank, Zero Technical Flaring during milling operation and Gas-based Engine Generators (GEGs) has been installed in remote satellite fields. These GEGs will help reduce nearly 4,900 tCO₂e/year. This is the result of eliminating the emissions from the burning of diesel as well as from reduced flaring.

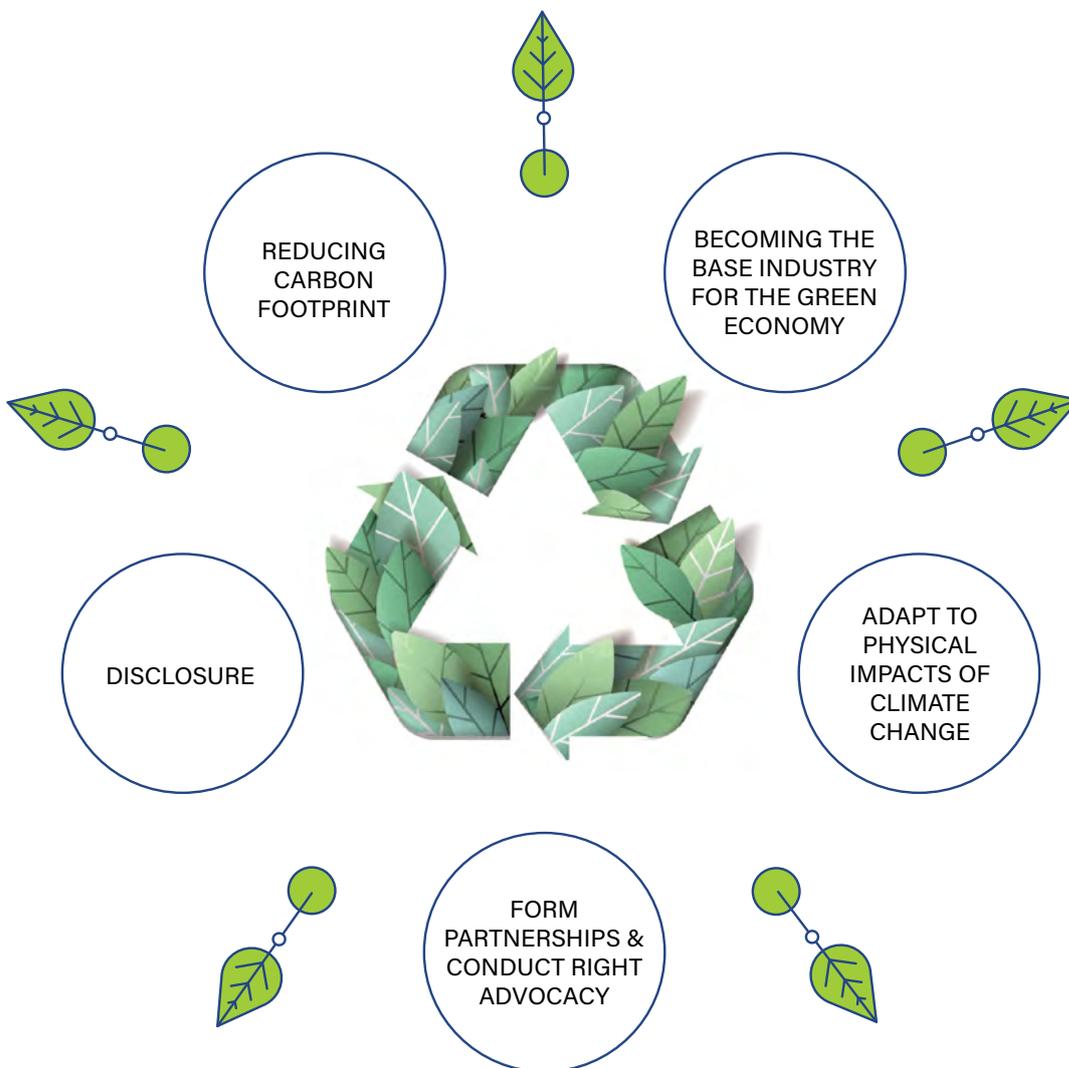
Category: **Zero Flaring, Fuel Reduction**



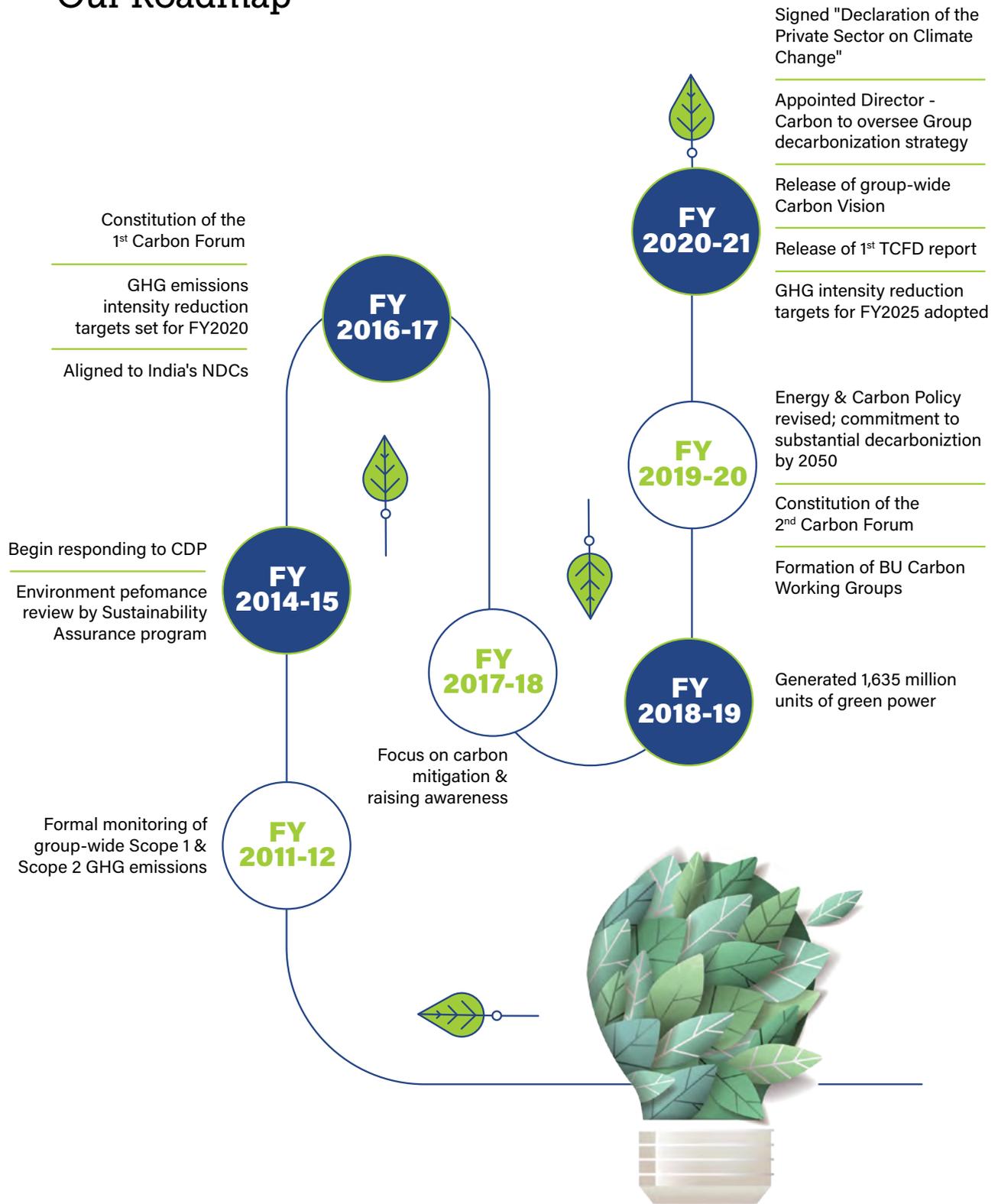


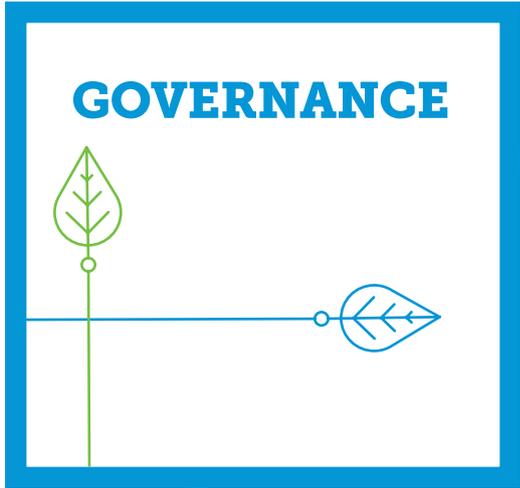
Building blocks of our Carbon Vision

Decarbonizing our business requires a coordinated effort from all parts of the enterprise. Vedanta's Carbon Vision is a holistic approach to engage the entire organization. It will guide the company as we evaluate how to operate with a low/zero-carbon mindset.



Our Roadmap





Our Energy and Carbon Management Policy and Performance Standard commit our operations to adopt and maintain global best practices in carbon and energy management and minimise greenhouse gas (GHG) emissions. Climate change has been identified as a material issue for the company and is part of the corporate risk register that is evaluated every quarter.

We updated our Energy & Carbon policy in FY2020 to include a pledge to significantly decarbonize our organization by 2050. We also reconstituted and revised the Terms of Reference for the 'Carbon Forum'

Vedanta's response to climate change is managed at several levels of the organization. A detailed description is provided below:

BOARD OF DIRECTORS

The Vedanta Board is responsible for all aspects of sustainability across the Group and acts through the Sustainability Committee. The Board, through the Sustainability Committee, takes strategic decisions on the company's response to the climate crisis.

THE SUSTAINABILITY COMMITTEE

The Board Sustainability Committee meets half-yearly to oversee the Company's Sustainability performance and ensure adequacy of the Company's Sustainability Framework. The Sustainability Committee receives advisory inputs from the Group Executive Committee (ExCo), Carbon Forum and Health, Safety, Environment & Sustainability (HSE&S) Management Committee. It also advises the Board on sustainability policies and management systems, including those related to climate and decarbonization. It clearly

sets out the commitments of our company to manage matters of sustainable development effectively. It ensures effective implementation of governance, advocacy and public relation mechanisms and practices related to Sustainability.

GROUP EXECUTIVE COMMITTEE

The Group ExCo is a high-level decision making body for the organization and operates in conjunction with and on advisory support of the Carbon Forum and HSE&S Management Committee. The Group CEO of Vedanta Limited heads the Group ExCo, which is entrusted with the responsibility of assessing and managing climate change related risks and opportunities. The body is responsible for implementing strategic plans formulated by the Board, allocating resources and reporting to the Board Committee on key climate-change and overall sustainability risks and the actions

being taken. The Group ExCo meets monthly and Vedanta's climate action is part of the overall business review.

CHIEF EXECUTIVE OFFICERS (CEOs)

CEOs of individual business units are responsible for implementation of climate-related mitigation and adaptation measures at the unit level. The CEO, along with the members of the BU Carbon Working Group are directly tasked with developing and overseeing the implementation of Vedanta's carbon mitigation and adaptation approach.

CARBON FORUM

The 'Carbon Forum', chaired by a CEO from one of our Group businesses, is a committee of Chief Operating Officers of our businesses. It has been tasked with developing and overseeing the implementation of Vedanta's carbon mitigation approach. Included in the forum's work are discussions

related to approving Vedanta's carbon management strategy, long-term greenhouse gas (GHG) emissions intensity reduction targets, alignment with investor requirements, emerging regulatory risks and carbon pricing. The carbon forum also informs the Group ExCo, Risk Management Committee and the Board Sustainability Committee on ways to manage our carbon footprint. At most of the Business Units, climate-related issues are overseen by the Chief Operating Officers (COOs) of the respective businesses. They are tasked with interpreting and implementing the group-level targets, policies, and standards for their respective businesses. By selecting COOs to implement carbon management, we are able to ensure that the matter is managed in a holistic manner since

they are in charge of operations, energy management, and other matters related to keep a plant operational - as such they are best positioned to ensure implementation of carbon reduction strategies. They are supported by the Environment/ Sustainability, energy, line operations managers of their businesses. The Carbon Forum meets every month to monitor progress on climate-related goals.

Key decisions by the Carbon Forum in FY2021 include:

- *Setting the long-term Carbon Vision for the organization*
- *Setting GHG emissions intensity reduction targets for FY2025*

The role of the Carbon Forum is to:

- *Guide individual businesses in*

setting their internal targets

- *Draft and amend policies and standards related to energy and carbon management*
- *Provide oversight and advice on the issue, serving as a subject-matter expert to the Board and the ExCo*

HSE&S MANAGEMENT COMMITTEE

HSE&S Management Committee (ManCom) discuss key HSE&S material topics impacting the organization including climate change. It also makes representation of the decisions to Group Executive Committee. The committee consists of select HSE&S heads at the BU and Corporate level, and the Director – Carbon & Social Performance. The HSE&S ManCom meets twice a week.

Senior leadership inspections of our operating facilities are intrinsic to their optimal management.



GROUP HSE & SUSTAINABILITY

At the group level, the climate-related matters are managed by Group HSE & Sustainability team. The role of the Group HSE & Sustainability is to ensure that:

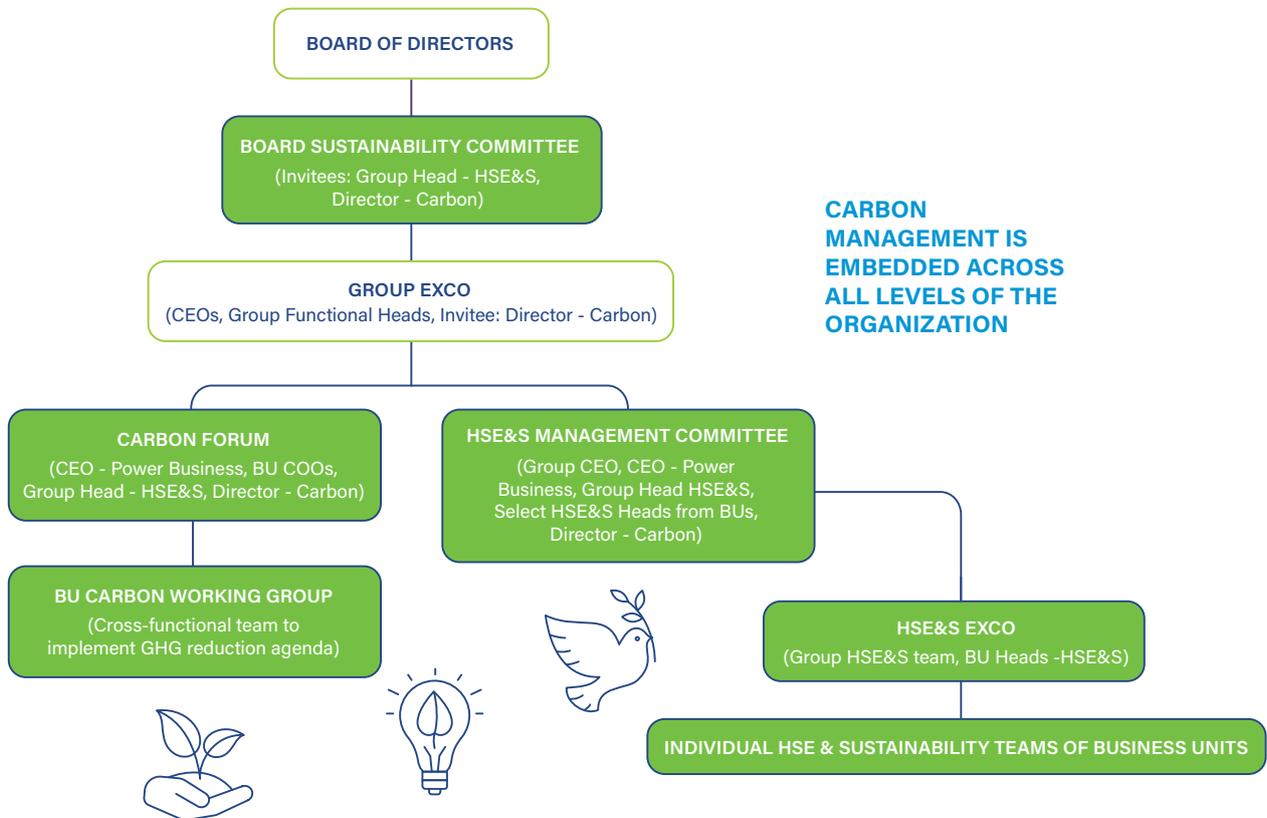
- *Group-level targets on carbon management integrated into corporate planning and target-setting*
- *The company aligns its carbon management strategy to*

emerging global best practices such as the framework suggested by TCFD, setting of carbon prices and scenario planning

Vedanta also provides incentives for the management of climate-related issues, including the attainment of targets. Each year, all of our business units and site locations are audited to evaluate their maturity levels

against the Vedanta Sustainability Framework (VSF), which is a set of policies, standards, and guidance notes related to sustainability management practices. Energy and carbon management is one of the areas that is covered during the audit evaluation. The performance in the audit is part of the performance bonus given to executives and they are thus incentivized to manage proactively on carbon management.

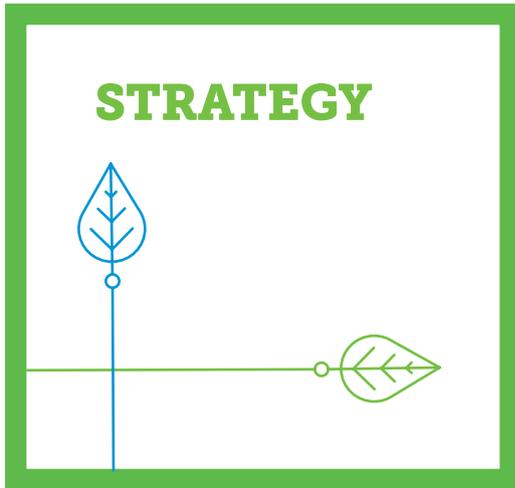
Hierarchy of Climate Governance at Vedanta



**Vedanta's CDP score has improved
from D to B- in the span of 1 year**



Power infrastructure at TSPL



Climate-related risks to our business

POLICY & LEGAL



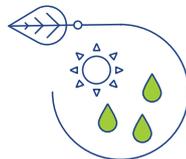
Regulatory changes aimed at limiting or reducing GHG emissions could potentially impact the company's operations with increased costs for fossil fuels

REPUTATIONAL



Inability to meet stakeholder expectations can result in a loss of reputation leading to a decline in the company's ESG risk rating

PHYSICAL



Availability of water could become a challenge
Rising temperatures will impact work conditions, increasing stress on the health of our shop-floor workforce

At Vedanta, climate-related business risk is part of the Group risk register. This enables us to review its progress at the highest level in the organisation. We believe that resilience is the best approach we can take to safeguard our climate-related business risks and

are committed to working with all our stakeholders in safeguarding our business. Identifying climate-related risks and opportunities allows us to value their impact on the business, to reduce our environmental impact, and to make a constructive contribution to the debate.

We have identified some climate-related risks that have the potential to have a substantive financial or strategic impact on our business. These are:

POLICY & LEGAL RISKS

We anticipate regulatory changes aimed at limiting or reducing GHG emissions. These reforms could potentially have an effect on the company's operations, with higher fossil fuel prices, pollution levies exceeding certain approved thresholds, taxes on GHG emissions, and higher administrative monitoring and reporting costs. Since nearly 90 percent of our electricity comes from captive coal-based thermal power plants, our operating costs can be greatly influenced by any regulation to reduce our GHG or other air pollutants. These costs may be in the form of increased capital expenditures or attributable to extreme non-compliance penalties.

India has also committed to ensuring that 40% of the country's energy is generated from renewable energy sources by 2030. In alignment with these targets, the government has introduced the Renewable Purchase Obligations (RPOs) for all large consumers of energy. As of FY2020, all business units consuming more than 5 MW of energy need to source 17.5% of their energy from renewable sources. Those unable to purchase or install renewables of equivalent capacity, can buy Renewable Energy Certificates (RECs). In FY2020, Vedanta purchased RECs for a combined cost of INR 1.09 billion. As the RPO requirements go up year-on-year, this cost will continue to rise. Moreover, the gradual implementation of carbon emissions exchange schemes

and stricter targets for reducing emissions are likely to increase costs and decrease demand growth.

REPUTATIONAL RISK

Climate change has become a risk that all of our investors are concerned about. Financial companies from around the world are trying to decarbonize their investment portfolio, mitigating their exposure to climate-related risks. Inability to meet their expectations will lead to a loss of credibility, most likely seen in a decrease in the ESG risk rating of the company - impacting access to finance. At various forums such as Group ExCo, Carbon Forum, HSE ExCo and Risk Committee, we have been regularly incorporating investor expectations into developing our carbon strategy.

PHYSICAL RISK

We expect physical risks related to extreme weather events, including changes in the availability of water due to climate change. With operations in both water-stressed areas and areas prone to flooding, changes in water availability is a material risk for the business. Additionally, our off-shore oil & gas assets may be at risk due to the increased frequency and intensity of cyclones. Rising temperatures, particularly for those who have to work outdoors, will also pose a danger to our workforce. We stagger working hours during peak summer months to combat heat risk, with total stoppage during the hottest times of the day.

Calciner plant in Lanjigarh alumina refinery



Climate-related opportunities to our business

In terms of climate-related business opportunities, the company expects to benefit from an increase in demand for copper, zinc and silver as the global renewable energy and electric vehicle industry expands. We will also benefit from the energy efficiency programs that we implement to reduce our GHG emissions. Over the last three years, Vedanta has saved nearly 6.24 million GJ of as a result of our energy conservation initiatives.

We are investing in developing low-carbon solutions and piloting projects that enable us to save more energy & fuel. In FY2020, we undertook 72 energy reduction projects across all our business units.

CASE STUDY

Drag Reducing Agent in our pipeline

We have introduced Drag Reducing Agent in our oil & gas pipeline at our Raageshwari Gas terminal to reduce turbulence. This injection of drag reduction agent helped us in saving around 900 tCO₂ equivalent per year. It also reduced risks involved in daily transportation of hydrocarbon condensate and increase flow capacity of the pipeline.

Category: **Process Efficiency**



CASE STUDY

Fuel saving techniques at Jharsuguda

At our aluminium smelter in Jharsuguda, multiple energy efficiency programs have resulted in the savings 3,127 tCO₂e/annum.

These include:

- Optimised usage of compressor in metal transport vehicles
- Reduction in HFO consumption in furnace
- Reduction of diesel consumption in production vehicles by improving engine efficiency
- Optimisation of LPG burner use for ingot casting

Category: **Process Efficiency**



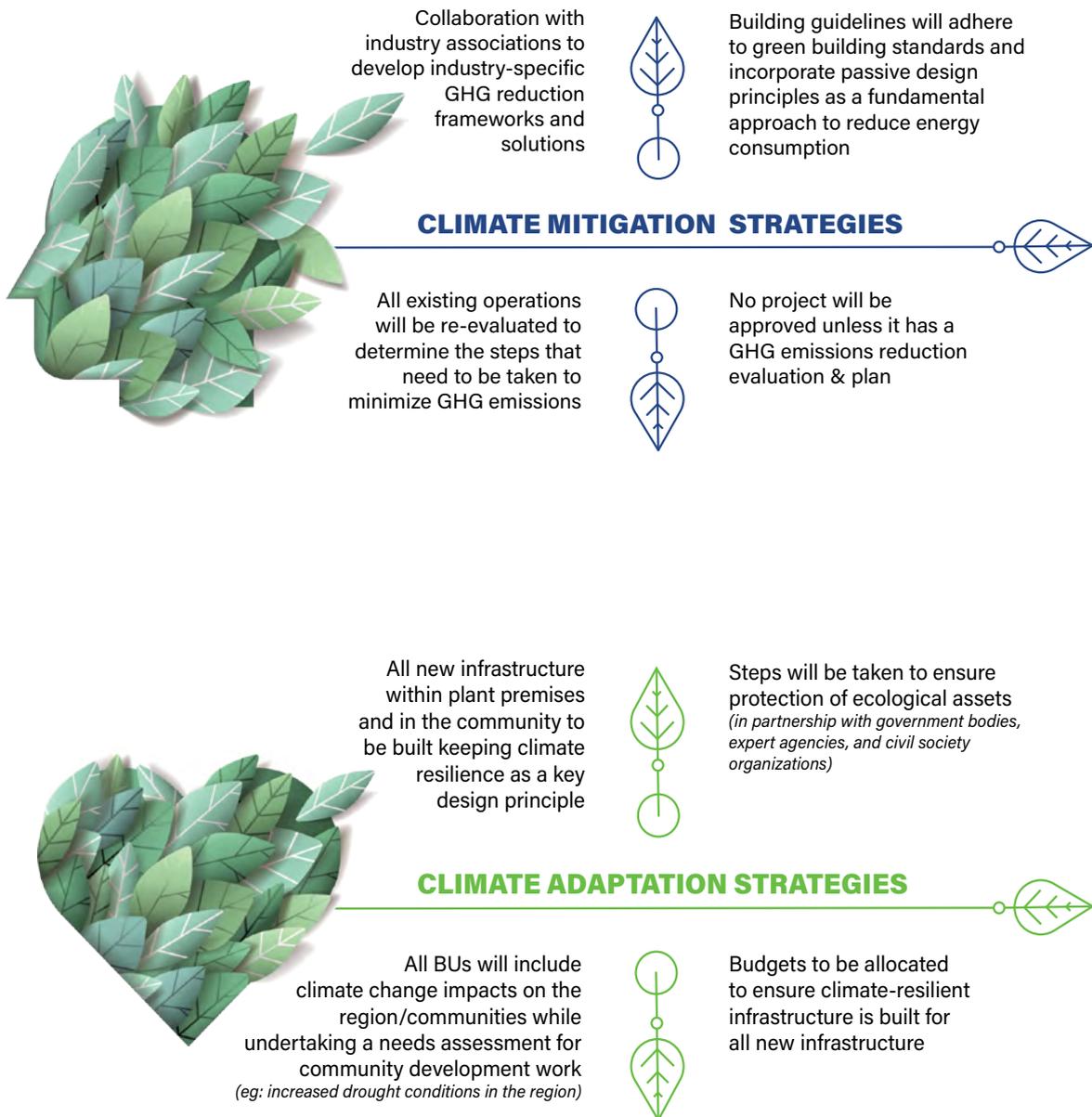
Climate-related scenario analysis

Our organization does not use climate-related scenario analysis to inform its strategy, but we anticipate using qualitative and/or quantitative analysis in the next two years. Our businesses are spread over a large geographic area, spanning several climatic zones, regulatory regimes, and stakeholder preferences. As a result, planning for climate-related scenarios becomes a complex activity with a high degree of uncertainty. We will be seeking expert assistance in developing climate scenarios for our group.



Mitigation & Adaptation Strategies

Although we are yet to implement climate change scenarios in our organization in line with our new carbon vision blocks, we are implementing a number of strategies to achieve our future targets and to realize climate-related opportunities. These strategies consist of both climate change mitigation & adaptation strategies.



The distinction between mitigation strategies for climate change and adaptation to climate change is that mitigation seeks to fix the causes and eliminate the future impacts of climate change, while adaptation looks at how to mitigate its detrimental consequences and how to take advantage of any opportunities that arise.

In our new Energy & Carbon Policy, we are committed to implement strategies to strengthen our actions in both mitigation and adaptation.

CLIMATE MITIGATION STRATEGIES

Vedanta takes a comprehensive view on reducing our carbon footprint. Our GHG reduction strategy covers our existing assets & infrastructure, assets that we will develop in the future, new acquisitions to the business and our supply chain.

All of our existing operations will be re-evaluated to determine the steps that need to be taken to minimize GHG emissions. This time, we will be including logistic solutions too in our evaluation process. Our new projects will be approved only if those have GHG emission reduction evaluation plan. Greenfield projects will necessarily explore sourcing most of their energy needs from low-carbon/zero-carbon sources. Green building standards and passive design principles will be incorporated as a fundamental

approach to reduce energy consumption. Finally, all of our new investments and acquisitions will develop a plan to align with our long-term climate goals within the first 24 months of the acquisition.

CLIMATE ADAPTATION STRATEGIES

We have been implementing climate adaptation strategies through Corporate Social Responsibility (CSR) activities. But in our new vision, we have taken this a step further to enhance our resiliency to climate change.

All of our infrastructures will be evaluated for impacts related to flooding, cyclonic activity, heat waves, and spread of contagious (vector-borne) diseases to increase the resiliency to climate change. All of our BUs will understand the role local ecological assets play in mitigating/adapting to climate

change. They also will be building a roadmap & committing financial resources for infrastructure upgrade to address climate impacts. All of this infrastructure upgradation is to be done by 2030. They will also have to include climate change impacts on the region/communities while undertaking a needs assessment for community development work (eg: increased drought conditions in the region). All our new infrastructures will be built keeping climate resilience as a key design principle & the budgets will be allocated to ensure climate-resilient infrastructure. Through our social activities, all community development will incorporate programs to address the climate change impacts identified in the need's assessment. For example, we will be empowering local farmers to adapt methods which can help them to cope with the climate change.

Karnataka Iron Ore





Material Assessment

Every three years, we conduct an exhaustive materiality assessment to understand stakeholder expectations from the Company. During FY2020, we completed our largest such exercise, having interacted with nearly 2,900 internal and external stakeholders via online surveys, focus group discussions, and face-to-face interactions.

The results of this exercise have been distilled by our senior leadership team into areas that require our immediate attention and intervention (High); areas that can be managed using our existing frameworks and protocols (Medium); and areas that need continuous monitoring to prevent them from becoming critical for the organisation over time (Low). Classification of the areas was done using the following framework:

- I. Importance to external stakeholders
- II. Importance to the Vedanta leadership team
- III. Potential regulatory impact
- IV. Potential reputational impact
- V. Potential financial impact

Climate change falls in the 'high' category and is an issue of significance for our external stakeholders as well as for the management team within the company.



Focus on Collaboration

Along with our mitigation and adaptation strategies, we are giving priority to collaboration too.

We will be approaching start-ups and academic institutions to develop value-added products, energy storage and waste management solutions. We will look forward to form alliances with industry associations to develop industry-specific GHG reduction frameworks and solutions that align with programs such as "Science Based Targets",

"RE100", "Hydrogen Council" and "OGCI":

We plan to work with governments and regulatory agencies to develop policies and incentives that aid in the adaptation of a low/zero-carbon pathway with the help of industry associates. We will fund research in academic institutions, which can aid in the development of technology or processes to reduce our GHG emissions, develop value-added products, energy storage and waste management solutions.

CASE STUDY

CARBON SEQUESTRATION

The Ravva greenbelt program

At Ravva, Cairn's offshore terminal, we have been planting flora native to the coastal habitat to enhance the local green-cover. Plants like mangroves, marsh grasses and other wetland species have the natural ability to draw down higher quantities of Carbon Dioxide per year than land plants and can store the carbon for centuries in their roots. The Ravva greenbelt program has turned the site to a hotspot for several avifaunal species and refuge to the smooth coated otter. A total of 16 species of trees, one climber, one shrub and four herbaceous mangrove associates have made this habitat their home. Collectively, the Raava greenbelt harbours 33 species of plants. This site has carbon sequestration potential of ~17,959 tons of Carbon dioxide per year, calculated based on the total carbon stock stored.

Category: **Sequestration, Climate Adaptation, Community Resilience**



METRICS AND TARGETS



Vedanta calculates and reports Greenhouse Gas (GHG) inventory i.e. Scope 1 (process emissions and other direct emissions) and Scope 2 (purchased electricity) in accordance with The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition), defined under the World Business Council for Sustainable Development (WBCSD) and World Resource Institute (WRI).

The company has aligned itself with the Nationally Determined Commitments of the Government of India and had committed to reduce our GHG intensity by 16% by 2020 from a 2012 baseline. As of 31st March 2020, Vedanta had reduced our GHG emissions intensity by 13.83%. This is equivalent to ~9 million tonnes of avoided GHG emissions. **We have extended the target to achieve 20% GHG emissions intensity reduction by FY2025, against a 2012 baseline.**

Our businesses range from mining operations (surface and underground), smelting and processing units, discovery and drilling of hydrocarbons, and generation

of electricity. A large portion of our activities are in regions where the base load of the energy grid is formed by fossil-fuel based electricity. In addition, many of our captive power plants use coal-based thermal technologies because of the broad and constant demand for electricity. Given the existence and position of our companies, due to the existing financial and technological constraints of the technologies, it has not been possible to turn to large-scale renewable energies. As a result, many of our programs for reducing GHG emissions continue to concentrate on improving the energy efficiency of our operations.

METRIC	UNIT	2018	2019	2020
Scope 1 emissions	Million tCO ₂ e	51	55.12	57.48
Scope 2 emissions	Million tCO ₂ e	1.20	3.51	1.86
Total		52.2	58.63	59.34

Vedanta calculates the reduction achieved by calculating business-specific absolute GHG emissions reduction achieved and dividing that number by the GHG emissions that would have been emitted, if the company

were operating at baseline year intensity levels. A cumulative number for the group is then calculated. Vedanta anticipates aligning to Science Based Targets (SBTs) in the next 2 years.

CASE STUDIES

RELATED TO EMISSION REDUCTION PROJECTS

Unlocking pipeline capacity to reduce emissions

At Raageshwari Deep Gas (RDG) field in Barmer Basin, we have adopted improvement in Frac Design like proppant density, tighter spacing, multiple fracs, and introduced innovations like Addressable Switch Firing System innovative methods to achieve near zero emissions during well testing and clean-up activities.



Checking the Hidden Fugitive



In the oil & gas industry, fugitive emissions can account for a significant proportion of unaccounted GHG emissions. At Cairn's Rajasthan operations, the company engaged an independent expert to conduct a fugitive emissions study based on the US EPA Method 21 approach. A leak detection and repair (LDAR) programme was also carried out to check for emission leaks from process equipment. We found that fugitive emissions accounted for only 0.011% of the total GHG emissions of the process and well-pad areas; significantly lower than the 13% correction factor that was being applied to account for the unmeasured emissions. This study highlights the excellent asset management and upkeep of facilities in our oil and gas business.

Use of PNG Burners by replacing the HSD burners at Pantnagar

Pantnagar Metal Plant has successfully installed and is running the highly efficient Piped Natural Gas (PNG) burners by replacing the High-Speed Diesel (HSD) burners, thereby reducing GHG emissions as well as enhancing net annual profit. PNG is one of the cleanest burning fuels and helps improve the quality of air; resulting in 15% reduction in GHG emission. In case of leakage, natural gas being lighter than air, disperses in the air. It also eliminates the need of storage space for the fuel. PNG is economical to LPG and any other liquid fuels; causing no spillage and pilferage.





METRICS AND TARGETS

More than 60% of our scope 1 emissions come from our Aluminium business. Higher production volumes in FY2020 led to an increase in total scope 1 emissions across all of the units. Vedanta does not report on the GHG emissions of its port business separately. These numbers are included in the GHG emissions of the Iron Ore Business.

Our business-wise Scope I emissions are:

Business	Scope I Emission (TCO ₂ e)		
	FY 2019-20	FY2018-19	FY2017-18
Aluminium	34,664,758	33,166,782	33,167,409
Copper India & Australia	35,037	30,571	624,738
Iron Ore Business	1,750,789	1,951,258	1,837,129
Oil & Gas Business	1,841,600	1,658,183	1,550,610
Port Business	0	376	0
Power Business	11,804,420	13,342,185	8,894,216
Steel	2,719,295	NA	NA
Zinc India	4,480,887	4,668,533	4,830,185
Zinc International	186,082	146,548	87,919
Total	57,482,868	54,964,436	50,992,206

In FY2020, Vedanta had a drastic reduction in our total scope 2 emission. Most of the reduction came from our Aluminium business because part of our IPP (Independent Power Plants) in Jharsuguda were converted to CPP (Captive Power Producer).

Our business-wise Scope II emissions are:

Business	Scope II Emission (tCO ₂ e)		
	FY 2019-20	FY2018-19	FY2017-18
Aluminium	804,257	2,655,128	237,024
Copper India & Australia	48,314	48,600	87,591
Iron Ore Business	762	265	18,428
Oil & Gas Business	134,987	118,000	84,980
Port Business	10,601	6,248	11,641
Power Business	2,775	777	8,901
Steel	113,155	NA	NA
Zinc India	253,756	168,248	154,564
Zinc International	496,104	508,921	594,167
Total	1,864,771	3,506,187	1,197,296

GHG emissions intensity

Business	FY2019-20			FY2018-19			FY2017-18		
	Scope 1 + Scope 2 GHG Emissions (TCO ₂ e)	Revenue (INR mn)	GHG Intensity (TCO ₂ e/INR mn)	Scope 1 + Scope 2 GHG Emissions (TCO ₂ e)	Revenue (INR mn)	GHG Intensity (TCO ₂ e/INR mn)	Scope 1 + Scope 2 GHG Emissions (TCO ₂ e)	Revenue (INR mn)	GHG Intensity (TCO ₂ e/INR mn)
Aluminium	35,469,015	265,770	133	35,821,911	292,290	123	33,404,433	231,560	144
Copper India & Australia	83,352	90,530	0.92	75,171	107,390	0.70	712,329	249,510	3
Iron Ore Business	1,751,552	34,360	51	1,951,523	29,110	67	1,855,557	31,620	59
Oil & Gas Business	1,976,587	126,610	16	1,776,183	132,230	13	1,635,590	95,360	17
Port Business	10,601	NA	NA	6,624	NA	NA	11,641	NA	NA
Power Business	11,807,195	58,600	201	13,342,962	65,240	205	8,903,117	56,520	158
Steel	2,832,450	42,830	66	NA	NA	NA	NA	NA	NA
Zinc India	4,734,643	181,590	26	4,836,781	206,560	23	4,984,749	220,500	23
Zinc International	682,186	31,280	22	655,469	27,380	24	682,086	34,460	20
Total	59,347,581	831,840	71	58,466,624	860,200	68	52,189,502	919,530	57

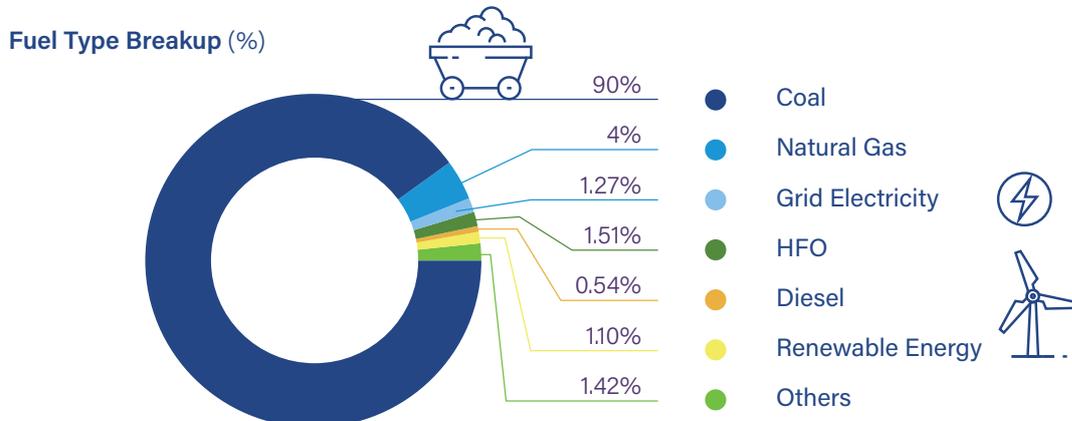
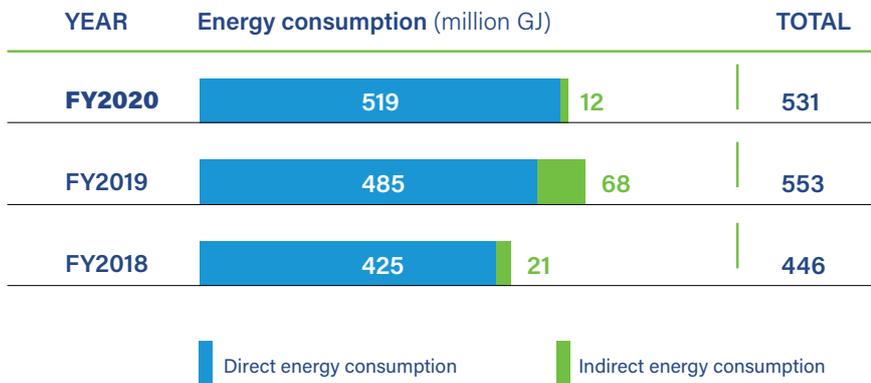
Electrosteels Steel Plant



Energy Management

Vedanta meets nearly 90% of its energy requirement from its captive power plants (CPP). Coal and natural gas are the dominant fuels for our CPPs and the company makes significant effort to ensure that it optimizes their performance efficiency. In FY2020, the organization undertook 72 energy conservation projects.

These include: Improvement of boiler efficiencies at our power plant, Load balancing measures dependant on demand for energy, Reduction in the use of furnace oil, upgrade of cathodes and process optimization in smelters.



CASE STUDY

Efficiency Improvement

A higher Current Efficiency (CE) leads to higher rate of zinc cathode production and lower power consumption. The global benchmark for CE in hydro zinc smelters is 92%, while the hydro-smelters at Chanderia Lead Zinc Smelter (CLZS) has achieved a CE of 93.2% by innovating modifications in the cell house and leaching section.

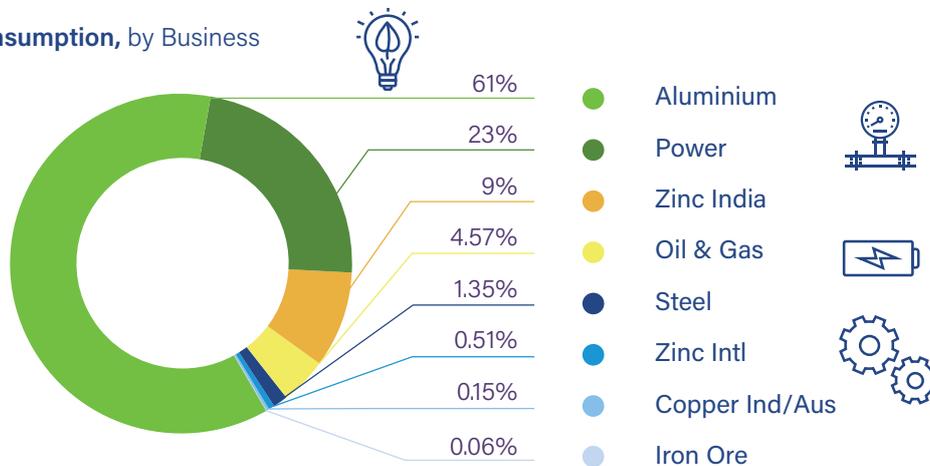
1% increase in CE is equivalent to 7.7 MT/day increase in cathode production and a 35kWh/MT decrease in power consumption.

This efficiency improvement has reduced GHG emissions by 30,000 TCO₂e per annum.

Category: **Process efficiency**



Energy Consumption, by Business



Energy Management

In total, we have achieved energy savings for 1.92 million GJ against a target of 1.75 million GJ. The total estimate GHG emissions savings from all of the 72 energy conservation projects is 439,811 TCO₂e.

Some of the projects, which resulted in the highest energy savings are mentioned in the table given below:-

S.N.	BU	Top 10 Energy/GHG Savings Initiatives	Energy Savings (GJ)	Related GHG Savings (TCO ₂ e)
1.	TSPL	Improvement of boiler efficiency through increased Gross Calorific Values	591,263	134,808
2.	TSPL	Improved load balancing of CW pump	364,501	83,106
3.	VAL-Jharsuguda	Decrease in HFO consumption in furnace	326,241	74,383
4.	BALCO	Cathode upgrade and process optimization of 40 pots in potline-1	96,216	21,937
5.	BALCO	Cathode upgrade and process optimization of 102 pots in potline-2	94,244	21,488
6.	VAL-Jharsuguda	Reduction in pot voltage by increasing potline current & reduction of dead-pot voltage	77,450	17,659
7.	BALCO	Increase in Potline1 current efficiency from 94.28% to 94.65%	69,856	15,927
8.	VAL-Jharsuguda	Energy saving cathode implementation	66,345	15,127
9.	BALCO	Reduction in auxiliary energy consumption	53,746	12,254
10.	BALCO	Increase in Potline 2 current efficiency from 93.85% to 94.38%	53,460	12,189
Totals (Top 10 Projects)			1,793,321	408,877

CASE STUDY

Root cause analysis at Jharsuguda Unit



With a view to harness large-scale energy savings, a root cause analysis was undertaken at the Jharsuguda unit. Based on the results, a number of conservation projects were implemented, which resulted in savings of 290,842 MWh/annum.

These projects include:

- Reduction in stub to carbon voltage, pot voltage, compressed air consumption, dead pot voltage, crossover voltage and specific energy consumption of wire rod mill
- Improvement of current efficiency of pots
- Implementation of slotted anode in pots
- Optimisation of compressor
- Online addition of pots in circuit by fuse blown technology
- HTM heater set point optimisation in GAP

Category: **Process Efficiency**

CASE STUDY

RELATED TO ENERGY CONSERVATION PROJECTS

CEP VFD Installation

TSPL, a subsidiary of Vedanta, is operating 3X660 MW supercritical power plant in the Indian state of Punjab. Hundred percent of the energy from the power plant is committed to the state of Punjab through long term PPA. Owing to seasonal changes in weather and crop pattern, TSPL load fluctuates between high power demand in Q2 owing to paddy season in Punjab and low demand season in Q3 and Q4 due to harsh winters and low power demand. This reduces plant load factor and deteriorates unit performance. In this scenario, TSPL has installed VFD (variable frequency drives) in all 3 units in CEPs (Condensate extraction pumps). This VFD offers good reduction in APC (Auxiliary Power consumption) at partial load.

All the VFD's have been commissioned and are showing good results. Performance test data shows a reduction of 443 KW at 60% load in each unit. Considering 60% of on-bar availability of units, the CEP is operational for 15,768 hours. Across 3 units, this implementation has resulted in the savings of 6.99 MU's, and a corresponding reduction of 6,366 tons of GHG emissions.

Category: **Process Efficiency**



METRICS AND TARGETS

Energy Management

We are also diversifying our energy portfolio to include renewable energy, which will help us reduce our carbon footprint. We have deployed the following renewable energy technologies across our operations:

Solar

Hindustan Zinc commissioned 12MW solar plant in Debari, 4MW solar plant in Dariba and 22 MW solar plant in Agucha on waste land/dump yard, which has reduced our land use. In addition, a 1 MW solar power project has been commissioned at Kayad mine, under the net-metering scheme. Rooftop solar projects were also completed taking the total to 40.6 MW for captive use. The green power generated from HZL's solar installations have reduced our carbon footprint by nearly

66,000 TCO₂e per annum. In the next phase, we have planned to commission a 100 MW solar power plant in near future. These efforts are geared to help Hindustan Zinc establish a firm footing in the field of solar energy generation for energy efficiency. The Debari and Agucha solar power projects have been registered under CDM and Gold Standard, which is the most rigorous certification standard globally for carbon offset projects.

Solar Power at Vedanta Limited

INSTALLATION OF SOLAR PANEL AT LANJIGARH

With a view to reduce greenhouse gas emissions and harnessing clean energy, solar power panels were installed at our Lanjigarh plant at the rooftops of different locations such as Admin Building rooftop (74 KWp) and HR Gate Office Building Roof Top (26KWp). A total installed capacity of 100 KWp was commissioned in this fiscal year, taking the total solar power generation capacity at Lanjigarh to 380 KWp. The project will help reduce power requirements from our captive power plant by ~154,000 KWh.



Wind

As part of our commercial renewable energy installations, the Company has installed 274 MW of wind farms in five states across India. These projects are registered under the CDM program by United Nations Framework Convention on Climate Change (UNFCCC) and the Verified Carbon Standard program by VEERA and the Gold Standard, which is the most rigorous certification standard globally for carbon offset projects. All energy generated is sold to the respective state DISCOMs and does not form part of Vedanta's energy mix.

Hydro

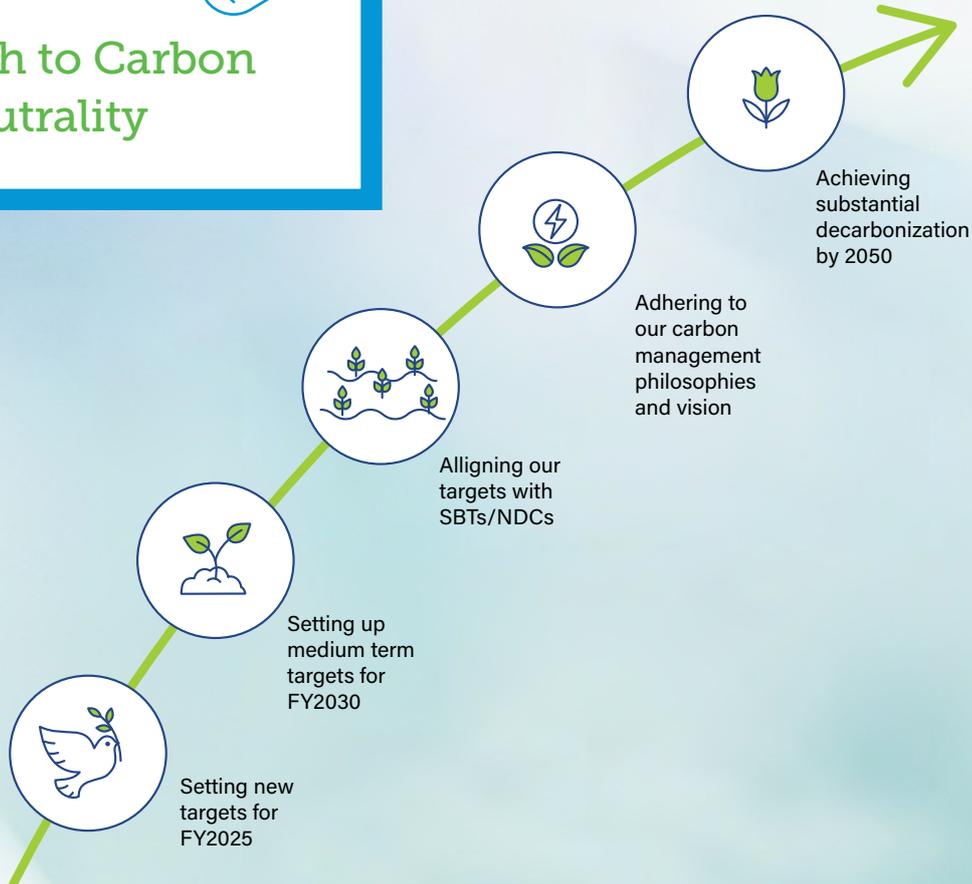
In Australia, our CMT unit procures energy from the state grid, which generates energy using hydro power. Nearly 23 million units were consumed by CMT, which is currently under care & maintenance.



HZL Wind Power

FUTURE ROADMAP

Path to Carbon Neutrality



This report is a foundation for action. Vedanta has committed to holding management to account through a direct linkage of climate-related targets and goals to executive remuneration and we have affirmed our commitment to advocate for public policy in pursuit of global decarbonisation. We will remain alert to technological, political and societal developments that may indicate changes to our signposts and the development of new uncertainties for our portfolio analysis. We will continue to monitor developments and review our approach as necessary, to respond to evolving approaches to

climate change and climate-related disclosures.

We will be inventorizing our Scope 3 emissions and where relevant - develop a roadmap to reduce them. We plan to engage long-term, essential Tier-1 suppliers to submit their GHG reduction strategies by 2025. They also have to align their strategies with Vedanta's decarbonization strategy by 2030. While our last set of targets were aligned to India's NDCs, we are deliberating if Science Based Targets (SBT) should be adopted for the entire group, or if we should continue to be aligned to India's

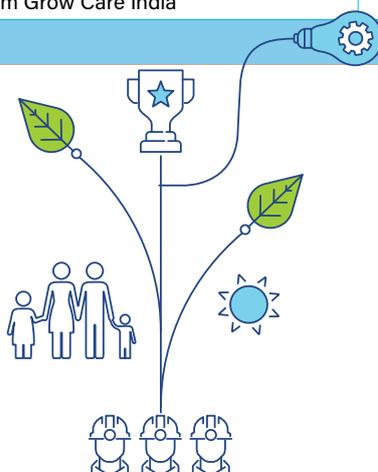
emissions reduction goals. We will be strictly following our carbon management philosophy and we will be initiating carbon due-diligence activities at the time of the acquisition process and appropriate budgets will be allocated to ensure that the transition is completed in the allocated time-period. All of our projects are supposed to have a carbon price attached to them by 2025. All of the BUs will be building a roadmap & commit financial resources for infrastructure upgrade to address climate impacts. We are also working with Innovation cells at all BUs to include GHG reduction as a key area of activity.



AWARDS & ACCOLADES

Throughout the years, we have received a number of awards and accolades for our excellency in Environment management and Climate Change initiatives. Some of them have been mentioned below:-

Business Unit	Award & Accolade	Project
Jharsuguda	CII Energy Efficiency Unit Award 2019 in 20th National Award for Excellence in Energy Management	CPP 1215 MW
Cairn Oil & Gas	Most Innovative Project - Climate Change & Mitigation; by CII (Greenco Summit)	Natural Gas Recovery - Zero flaring during frac well milling operation
	CII Environmental Best Practices Award	Zero technical flaring during milling operation
Hindustan Zinc	Gold Award, awarded by SEEM National Energy Management	Chanderiya Smelting Complex
	Project Development Innovation of the Year - at the 9annual edition of Re-Assets India conference	Rampura Agucha - 22 MW Agucha solar project
	Excellence Award - Environment Management from CII	Environment Management
Vedanta Ltd.	'2good, 4good Certification' rating by Economic Times	-
BALCO	Asia Sustainability Excellence Award 2017 under the category 'Best Overall Sustainable Performance' by World CSR Day	-
	Award for Excellent Management in Industrial Health, Safety & Environment from Grow Care India	-



CDP Climate Change 2020 Score: B-



GET IN TOUCH

We value your feedback and welcome comments on this report or any aspect of our approach to sustainability reporting.
sustainability@vedanta.co.in

VEDANTA LIMITED

REGISTERED OFFICE: Vedanta Limited, 1st Floor, 'C'
wing, Unit 103, Corporate Avenue, Atul Projects, Chakala,
Andheri (East), Mumbai - 400093, Maharashtra, India
T +91 22 6643 4500 | F +91 22 6643 4530

CIN: L13209MH1965PLC291394

www.vedantalimited.com