

# Hindustan Zinc Limited

## Scope 3 Emissions Methodology



## Materiality

### Organizational and Reporting Boundary

The organizational boundary for Scope 3 has been defined on an operational control basis, which is aligned with HZL's accounting and reporting of Scope 1 and 2 emissions. Scope 3 emission calculation is basis GHG protocol [Scope 3 calculation guidance](#).

### Materiality Assessment

Reporting against Scope 3 categories is basis International Zinc Association's [Scope 3 Emissions Accounting and Reporting Guidance ZINC for the value chain version 1.0](#) and ICMM's [Scope 3 Emissions Accounting and Reporting Guidance](#).

The below table provides an overview of the materiality of each category in the Scope 3 inventory for Hindustan Zinc Limited in line with International Zinc Associations Scope 3 guidance.

Category	Materiality
Category 1 Purchased Goods & Services	High
Category 2 Capital Goods	High
Category 3 Fuel & Energy Related Activities	High
Category 4 Upstream Transportation & Distribution	High
Category 5 Waste Generated in Operations	Medium
Category 6 Business Travel	Low
Category 7 Employee Commuting	Low
Category 8 Upstream Leased Assets	Low
Category 9 Downstream Transportation & Distribution	High
Category 10 Processing of Sold Products	High/Medium
Category 11 Use of Sold Products	Low
Category 12 End-of-life Treatment of Sold Products	Low
Category 13 Downstream Leased Assets	Low
Category 14 Franchises	Low
Category 15 Investments	Medium

**Low:** Activities in each category are considered immaterial compared to others performed by the company - this occurs due to low carbon intensity, reduced recurrence and size of activities and/or low strategic relevance for the company.

**Medium:** Activities that usually depend on the recurrence, size and carbon- intensity of operations performed by the company.

**High:** Activities that represent relatively large amounts of emissions or considered strategic by the company.

The rationales for inclusion and exclusion are provided in the category-wise detailed SoP. As emission factors related to scope 3 evolve with time, we may update our methodology basis best available data going ahead.

## Hindustan Zinc Limited's category wise Scope 3 FY2024

Category	Emissions tCO <sub>2</sub> e
Category 1 - Purchased Goods and Services	4,32,386
Category 2 - Capital Goods	2,425
Category 3 - Fuel and energy-related activities	8,44,295
Category 4 - Upstream transportation and distribution	14,196
Category 5 - Waste generated in Operations	9,631
Category 6 - Business travel	205
Category 7 - Employee commuting	1,237
Category 8 - Upstream leased assets	0
Category 9 - Downstream transportation and distribution	42,679
Category 10 - Processing of sold products	2,36,071
Category 11 - Use of sold products	Not Applicable
Category 12 - End-of-life treatment of sold products	16,830
Category 13: Downstream Leased Assets	Not Applicable
Category 14: Franchises	Not Applicable
Category 15: Investments	Not Applicable
<b>Total Emissions</b>	<b>15,99,955</b>

## Category 1: Purchased Goods & Services

This category includes upstream emissions from the production of products purchased by Hindustan Zinc for its operations in the reporting year. Products includes goods & materials (tangible products)

<b>Materiality</b>	<b>High</b>
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### Boundary

Emissions sources relevant and material to our industrial operations have been categorized into production consumables & infrastructure consumables.

### Inclusions

#### Production consumables

Emissions linked to the key materials used in the production processes of our industrial assets, such as explosives, soda ash, lime, cement etc., to create intermediate or first-use products. In this category we have considered emissions from consumables sourced from A, B & C category suppliers as per [Vedanta's Critical supplier](#) identification policy.

#### Infrastructure Consumables

Emissions associated with the production of infrastructure consumables like valves, pipes, motors & tyres that are key elements of our industrial production processes but are not directly consumed during the process. In this category we have considered emissions from consumables sourced from A & B category suppliers as per [Vedanta's Critical supplier](#) identification policy.

**ABC Classification** is used to assess the criticality of our Business Partners basis 5 criteria's- linkage to business outcome, Spend, criticality of domain, sensitivity and non-substitutability.

### Exclusion

Purchased services (identified as not material or relevant) as services related to onsite operations & maintenance (O&M) have been considered in Scope 1 & Scope 2 emissions of the company.

### Activity data required

Quantities of goods purchased or acquired in the reporting year (e.g., quantity of consumable items or spend).



### Calculation methodology

Supplier specific (Primary data method)	Average data (Secondary data method)	Spend based (Tertiary data method)
Calculates GHG emissions included in purchased goods by multiplying the mass of goods by the relevant primary cradle-to-gate emission factor (product-specific emissions per unit of mass).	Estimates GHG emissions included in purchased goods by multiplying the mass of goods acquired by the relevant secondary cradle-to-gate emission factor (average emissions per unit of mass)	Estimates emissions included in purchased goods by collecting data on their economic value and multiplying these by relevant secondary emission factors.
<b>Sum across purchased goods:</b> $\sum (\text{mass of purchased good (tonne)} \times \text{supplier-specific product emission factor of purchased good (tonne CO}_2\text{e/tonne)})$	<b>Sum across purchased goods:</b> $\sum (\text{mass of purchased good (tonne)} \times \text{emission factor of purchased good per unit of mass (tonne CO}_2\text{e/tonne)})$	<b>Sum across purchased goods:</b> $\sum (\text{value of purchased goods (\$)} \times \text{emission factor of purchased good per unit of economic value (tonne CO}_2\text{e/\$)})$
Primary data from supplier’s sustainability report / Business Responsibility & Sustainability Report (BRSR)	Available data in public domain	The emissions factors used are based on the EEIO spend-based methodology.

### Key Assumptions

When using financial data, it does not distinguish among product, transportation, and usage costs. USEEIO consists of cradle-to-gate emission factors which account for the full life cycle of the goods—including upstream transport costs.

### Emission Factors Data Source/References

Open Input Output. (2011). Sustainability Consortium. University of Arkansas  
[EEIO Category descriptions based on “NAICS \(North American Industry Classification System\)” Supply Chain Greenhouse Gas Emission Factors v1.2 by NAICS-6](#)



## Category 2: Capital Goods

This category includes all upstream (i.e., cradle-to-gate) emissions from the production of capital goods purchased or acquired by the reporting company in the reporting year.

<b>Materiality</b>	<b>High</b>
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### Boundary

Upstream emissions associated with the production of capital goods that have been procured for HZL's operations. Capital goods are those that are treated as fixed assets, or as plant, property and equipment (PP&E), and are not typically amortized over the life of the asset. The total cradle-to-gate emissions of the capital goods are accounted for in the year of acquisition. For Hindustan Zinc, this is limited to, mining machinery and equipment, plants and facilities (as and when operational)

### Inclusion

- Mining Machinery

### Exclusion

- Upcoming capital projects that are not yet operational.
- Electronic machinery & spares for smelters and mines are considered in Category 1 basis Vedanta's Critical supplier policy (A & B Class)

### Activity data required

Amount spent on capital goods by product type.

### Calculation methodology

#### Method: Spend based

Emission is estimated by collecting data on the economic value of capital goods purchased and multiplying these by relevant secondary emission factors.

**Sum across capital goods:**  $\sum (\text{value of capital good } (\$) \times \text{emission factor of capital good per unit of economic value (tonne CO}_2\text{e}/\$))$

### Key Assumptions

- It was assumed that capital goods suppliers produce emissions in line with industry average estimates, and that general and global average emission factors may be applied appropriately.
- The use of financial data does not differentiate between the product, transportation and use costs.

### Emission Factors Data Source/References

Open Input Output. (2011). Sustainability Consortium. University of Arkansas

[EEIO Category descriptions based on "NAICS \(North American Industry Classification System\)" Supply Chain Greenhouse Gas Emission Factors v1.2 by NAICS-6](#)



## Category 3: Fuel- and Energy-Related Activities

This category includes emissions related to the production of fuels and energy purchased and consumed by Hindustan Zinc in the reporting year that are not included in Scope 1 or Scope 2.

<b>Materiality</b>	<b>High</b>
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### Boundary

Extraction, production and transportation of fuels and energy purchased by HZL in the reporting year. Well-to-tank (WTT) emissions for the fuel consumed reported as Scope 1 emissions have been considered in this category along with T&D losses associated with purchased grid electricity.

### Inclusion

- Well-to-tank (WTT) emission for fuel consumed at operations.
- Upstream emissions from extraction, production, and transportation of fuel combusted to produce grid electricity imported for the operations.
- T&D losses associated with purchased grid electricity.

### Exclusion

Emission from combustion of fuel & consumption of grid electricity are attributed in Scope 1 & Scope 2 respectively.

### Activity data required

Quantities of fuel/ electricity consumed in the reporting year.

### Calculation Methodology

Upstream emissions from extraction, production and transportation of fuels consumed at operations.

### Average data (Secondary data method)

**Sum across each fuel type consumed:**  $\sum (\text{fuel consumed (Tonnes or MWh)} \times \text{upstream fuel emission factor (Tonnes CO}_2\text{e)/Tonnes})$

### Emission Factors Data Source/References

[DEFRA: Greenhouse gas reporting: conversion factors 2023](#)



## Category 4: Upstream Transportation and Distribution

Transportation and distribution of products purchased by HZL in the reporting year as considered in category 1 (in vehicles and facilities not owned or controlled by Hindustan Zinc).

<b>Materiality</b>	<b>High</b>
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### Boundary

Emissions from third-party transport paid for by Hindustan Zinc, which is used to transport goods purchased by HZL and Inter-unit transport of goods (both to and between our operational sites) for which transportation has not already been included in Category 1.

### Inclusion

- Inter-unit transport of goods between company's operated sites.
- Emissions due to transport of goods from upstream suppliers to company's site.

### Exclusion

- Emissions attributed to transportation of purchased goods except Soda Ash, Lime, Cement, Aluminium sheets are already included in category 1.
- Emissions attributed to transportation of fuels are included in category 3.

### Activity data required

- Quantities of the products procured.
- Distance from supplier's site to company's operated sites.

### Calculation method: Distance-based method

**Sum across transport modes:**  $\sum$  mass of goods transported (tonnes)  $\times$  distance travelled (km)  $\times$  emission factor of transport type (tonne CO<sub>2</sub>e/ tonne / km)

### Emission Factors Data Source/References

[DEFRA: Greenhouse gas reporting: conversion factors 2023](#)





## Category 5: Waste generated in Operations

This includes emissions from third-party disposal and treatment of solid waste that is generated in HZL's operations in the reporting year.

<b>Materiality</b>	<b>Medium</b>
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### Boundary

Scope 3 emissions from waste generated in Hindustan Zinc's operations are not material but have been calculated.

### Activity data

- Waste produced (tonnes) and type of waste generated in operations
- For each waste type, a specific waste treatment method applied (e.g., landfilled, incinerated, recycled).

### Inclusion

Tonnage of waste generated by all operations is collected for the following:

- Hazardous & Non-Hazardous waste recycled
- Hazardous & Non-Hazardous waste landfilled
- Hazardous & Non-Hazardous waste incinerated
- Transportation of all the above categories of wastes from HZL's site to third-party sites.

### Exclusion

- Waste disposed of within HZL's operational boundaries is not included in Category 5, as emissions associated with processing these wastes are included in Scope 1.
- HZL is a Zero Liquid Discharge (ZLD) company and wastewater is treated and reused inside plant boundary.

### Calculation method

Waste-type-specific method, which involves using emission factors for specific waste types and waste treatment methods was used. The quantity of waste generated in operations in the reporting year is multiplied by the waste type and waste treatment specific emission factor.

**Sum across waste types:**  $\sum$  (waste produced (tonnes)  $\times$  waste type and waste treatment specific emission factor (TCO<sub>2</sub>e/tonne))

### Emission data source

The emissions data was calculated using the waste specific industry average data for waste treatment using [BEIS 2022](#) emission factors & GaBi database.



## Category 6: Business Travel

This category includes emissions from the transportation of employees for business related activities in vehicles not owned by Hindustan Zinc Limited.

<b>Materiality</b>	<b>Low</b>
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### Boundary

This category covers emissions from domestic and international flights taken by employees for business commuting purposes, with all other travel being excluded. We have policies in place that promote behavioral changes to avoid traveling whenever it is possible.

### Activity data

Transportation of employees for business related activities in vehicles not owned by Hindustan Zinc Limited.

### Inclusion

Emissions from domestic and international flights taken by employees for business commuting purposes

### Exclusion

Business travel related emissions from rail & road were considered as immaterial to the overall Scope 3 and were excluded from the calculation.

### Emission data source

Travel-related emissions were provided by the travel agency.



## Category 7: Employee Commuting

This category includes emissions from the transportation of HZL’s employees between their homes and their work sites.

<b>Materiality</b>	<b>Low</b>
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### Boundary

This refers to emissions attributed to the transportation of employees between their homes and their work sites during the reporting year.

### Inclusion

Third party bus transport facility for employees to commute from their homes to their work sites.

### Exclusion

Personal vehicles used for commute between work sites and home.

### Calculation Methodology

Upstream emissions from fuels consumed for operations of bus for employee commute to & fro from work and office.

### Fuel-based method

**Sum across each fuel type consumed:**  $\sum (\text{fuel consumed (Tonnes)} \times \text{fuel emission factor (Tonnes CO}_2\text{e/Tonnes)})$

### Emission Factors Data Source/References

[DEFRA: Greenhouse gas reporting: conversion factors 2023](#)



## Category 9: Downstream Transportation and Distribution

This category includes emissions that occur in the reporting year from transportation and distribution of sold products in vehicles and facilities not owned or controlled by Hindustan Zinc Limited.

<b>Materiality</b>	<b>High</b>
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### Boundary

Emissions associated with third-party transport not paid for by HZL and used to transport goods produced by HZL to the first-use customers.

### Activity data

- Quantities of products produced and sold to customers.
- Distance to first-use customer.

### Inclusion

- Transport of finished goods between company's operated sites & first-use customer.

### Exclusion

- Transportation in vehicles owned or controlled by HZL.
- Third-party transportation paid for by HZL.

### Calculation method: Distance-based method

**Sum across transport modes:**  $\sum$  mass of goods transported (tonnes)  $\times$  distance travelled (km)  $\times$  emission factor of transport type (tonne CO<sub>2</sub>e/ tonne / km)

### Emission Factors Data Source/References

[DEFRA: Greenhouse gas reporting: conversion factors 2023](#)

For Rail transport is considered from [GHG calculator of TERI](#)



## Category 10: Processing of sold products

It includes emissions from the processing of sold intermediate products by third parties (e.g., manufacturers) after sale by HZL.

<b>Materiality</b>	<b>High/ Medium</b>
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### Boundary

Category 10 emissions are considered material & relates to the GHG emissions originating from the first processing process of the intermediate goods supplied by HZL.

### Inclusions

GHG emissions of downstream companies that occur during the processing of the sold product into an intermediate use.

### Calculation method

Emissions from processing sold products produced by our industrial assets, where there is limited visibility in the product value chains, hindering our ability to estimate emissions we use industry average data sourced from GaBi database & from data available in public domain.

### Activity data required

Quantities of products produced by our industrial assets and sold to third parties

### Average data method

**Sum across intermediate products:**  $\sum$  (mass of sold intermediate product (Tonnes)  $\times$  emission factor of first processing of sold products (Tonnes CO<sub>2</sub>e/Tonnes of final product))

### Emission data source

The emissions data was calculated using the industry average data GaBi database, International Zinc Association's [Scope 3 Emissions Accounting and Reporting Guidance ZINC for the value chain version 1.0](#) & public domain.



## Category 12: End-of-Life Treatment of Sold Products

This category includes emissions from treatment of products sold by the reporting company (in the reporting year) at the end of their life. This includes the total expected end-of-life emissions from Lead sold in the reporting year.

<b>Materiality</b>	<b>Low</b>
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### Boundary

Emissions arising due to end-of-life treatment of the company's sold products have an immaterial contribution to the overall Scope 3 emissions

### Activity Data

Total mass of Lead sold from the point of sale by HZL to the end-of-life after customer use.

### Inclusion

End-use lead battery recycling.

### Exclusion

- Given that SHG Zn & Silver ingots are not usually considered an end-product, there is no end-of-life treatment for it.
- All secondary products have been excluded from this category.

### Calculation Method

This category includes the total expected end-of-life emissions from Lead sold in the reporting year. Sales data for lead was multiplied by lead-specific average global recycling rates to estimate the emissions associated with end-of-life of the products sold.

**Sum across waste treatment methods:**  $\sum$  (total mass of sold products from point of sale to end of life after consumer use (Tonnes)  $\times$  % of total end-of-life product being treated by specific treatment method  $\times$  emission factor of treatment method (TCO<sub>2e</sub>/Tonnes))

### Key Assumptions

End-of-life emissions were assumed only for lead batteries. It is assumed that 86% of the lead produced annually is used in lead-acid battery manufacturing which is recyclable.

### Emission data source

Secondary data available in public domain.



## Category 8: Upstream Leased Assets

This includes emissions from the operation of assets that are leased by the reporting company in the reporting year and not already included in the reporting company's scope 1 or scope 2 inventories

<b>Materiality</b>	<b>Low</b>
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**Exclusion:**

Category 8 has been excluded from HZL's footprint, as emissions related to electricity consumed by our marketing offices are paid for by the company.

## Category 11: Use of sold products

This category includes emissions from the use of goods and services sold by the reporting company in the reporting year. A reporting company's scope 3 emissions from use of sold products include the scope 1 and scope 2 emissions of end users. End users include both consumers and business customers that use final products.

<b>Materiality</b>	<b>Low</b>
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**Exclusion:**

We are primarily the manufacturer of non-ferrous metals which is sold as an intermediate product in the form of an ingot and is not the final product.

## Category 13: Downstream Leased Assets

This category includes emissions from the operation of assets that are owned by HZL (acting as lessor) and leased to other entities in the reporting year that are not already included in Scope 1 or Scope 2. This category was applicable to lessors (i.e., companies that receive payments from lessees).

<b>Materiality</b>	<b>Low</b>
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**Exclusion:**

Category 13 has been excluded from HZL's footprint, as HZL did not lease any assets in FY2023-24 to third parties.

## Category 14: Franchises

This category includes emissions from the operation of franchises not included in Scope 1 or Scope 2. A franchise is a business operating under a license to sell or distribute another company’s goods or services within a certain location. This category is applicable to franchisors (i.e., companies that grant licenses to other entities to sell or distribute their goods or services in return for payments, such as royalties for the use of trademarks and other services).

<b>Materiality</b>	<b>Low</b>
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**Exclusion:**

HZL does not operate on a franchise model and therefore does not have any franchises to which emissions can be attributed.

## Category 15: Investments

This category includes scope 3 emissions associated with the reporting company’s investments in the reporting year, not already included in scope 1 or scope 2.

<b>Materiality</b>	<b>Medium</b>
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**Exclusion:**

HZL has not done any major investment or acquisition which are not part of scope 1 and scope 2 emissions. Thus, scope 3 emission from the investment has been considered as zero and neglected for the reporting year.

