Graphite India Limited

ESG REPORT FY 2023-24

Progress in the Journey of Value Creation Through ESG

Contents

Alignment with Sustainable Development Goals

Description	**Key SDGs Addressed**
ENVIRONMENTAL	
• Environmental Management	
• Energy	
• Climate Change	
• Greenhouse Gas Emissions	
• Avoided Emissions	
• Water Conservation	
• Life Cycle Assessment	
• Solid Waste Management	
• Circular Economy	
• Biodiversity	
• Air Quality	
• Innovation & Technology	
SOCIAL	
Stakeholder Engagement	
Health and Safety	
Training and Development	
Employee Engagement	
People, Diversity and Inclusion	
Performance Appraisal, Incentives and Rewards	
Attrition	
Supply Chain	
GOVERNANCE	
ESG Governance	
Ethics & Compliance	
Human Rights	
Board Governance	
Shareholder Relations	
Disclosure Practices	

Message from the Chairman

Dear Stakeholders,

I am pleased to present our third ESG Report to you.

We continue to move forward on our journey of excellence in ESG (Environment, Social, and Governance) while strengthening our position in the marketplace. We have been creating value through this journey of ESG by managing risks, enhancing resilience, and making a meaningful impact in our business ecosystem.

As I had mentioned in the last report, we have committed ourselves to becoming a dedicated ESG company. We have set comprehensive targets under professional guidance and are seeking your feedback through this ESG report. This report outlines our performance against the key targets set last year.

While we have always believed that we are one of the least environmental impact creating synthetic graphite electrode manufacturer globally, we have, during the current year conducted an LCA (Life Cycle Assessment) study of the synthetic graphite electrodes manufactured by us. The study reconfirms our belief. The LCA report is available on our website. We will now try to objectively reduce the environmental impacts further, going forward. Investments have been made for captive generation of wind, solar and hydro power to reduce electricity costs and moving towards green energy.

We have demonstrated our firm support on social and governance aspects by adopting policies on Business Ethics, Human rights, Equal Employment Opportunity and Diversity, Equity and Inclusion. In other words, the company remains resolute to be a fair and just employer, accept the best practices of ethics for governance and access human resources without any discrimination. Many other social initiatives across our value chain are ongoing and I would be happy to share details with you soon. Our sustainable supply chain initiative is one of them. We are trying to influence our supply chain to follow the path of sustainable growth.

We welcome your valuable suggestions and ideas, which you can send to "corp_accts@graphiteindia.com." We will certainly consider them as we move forward.

Yours sincerely,

K K Bangur

Message from the Executive Director

Dear Stakeholders,

We have formalized our commitment to excellence in ESG (Environmental, Social, and Governance).

Incorporating ESG aspects into long-term business strategies and growth plans is increasingly getting vital. A well-defined ESG strategy allows an organization to create a roadmap that considers stakeholder views, is realistic, and provides measurable sustainability metrics to track performance against its goals. This approach not only creates sustainable value for stakeholders but also improves the company's bottom line. Businesses with a high level of ESG maturity are more resilient to risks and disruptions.

To share our plans and progress in ESG, we have released the following disclosures this year:

- ESG Report FY 2023-24
- Business Responsibility and Sustainability Report (BRSR) FY 2023-24

Last year, we prioritized our ESG journey by focusing on key environmental parameters. While maintaining our excellence in environmental performance, we have now included social and value chain-related aspects in our focus.

In FY 2023-24 in addition to scope 1 and 2 accounting, we have carried out scope 3 accounting of greenhouse gases for the entire company and got these data independently verified by a reputed global certification agency.

The LCA (Life Cycle Assessment) study of our principal product, Synthetic Graphite Electrodes, has demonstrated our global leadership position of being the least environmental impact manufacturer. The results of the study demonstrate years of focused initiatives taken by us in terms of resource efficiency.

Energy management, both in terms of energy efficiency as well as increase in renewable energy share in the energy mix, continues to be our priority. We have made investments for captive generation of wind, solar and hydro power. Replacement of grid electricity with purchased renewable energy have also been formalised. The positive impact of our green energy initiatives will be evident in the future years as renewable energy would meet 36% of our energy requirement by June, 2025.

We have adopted important policies on Business Ethics, Human Rights, Equal Employment Opportunity and Diversity, Equity and Inclusion. The policies are being rolled out across the business eco system with adequate training and support with an objective to become a benchmark among our peer industries in social and governance aspects too. Further, we have started influencing our supply chain to move towards sustainable growth by following the 9 principles of NGRBC while doing business. At present we have covered about 90% of our suppliers by value of supply. We will extend this to cover all our suppliers in future.

We are sharing our progress with you through this ESG Report for FY 2023-24.

Yours sincerely,

A Dixit

Overview

Graphite India Limited (GIL) started its journey more than five decades ago when industrialization of India was at very nascent stage. GIL was a pioneer in manufacturing of Graphite Electrode in this part of world. GIL started its venture in 1967 at Durgapur manufacturing only Graphite Electrodes.

In these five decades GIL has spread its wings not only in India but also in Europe, such as in Nuremberg , Germany through 100% subsidiaries.

GIL operates through three segments: Graphite and Carbon, Steel and Others. Its products include graphite electrodes, impervious graphite equipment, specialty products, carbon products, glass reinforced plastic pipes and high speed and alloy tool steel.

Today, GIL has a manufacturing capacity of over 120,000 tonnesof various products per annum with plants at 7 locations in India.

The company has a geographically diversified customer base and exports graphite electrodes to the Middle East, Europe, the US and South East Asia.

It also continues to benefit from economies of scale and its competitive cost structure on a global scale. Particularly its Durgapur facility, are among the low-cost graphite electrode manufacturing lines, globally.

I. Environment

GIL is a responsible organization that strives to create positive impact through its businesses and operations. One of our main goals is to be an environmental steward for the communities and ecosystems we operate within.

We havedisclosed our climate performance under the Carbon Disclosure Project (CDP) and has achieved a rating of “B -”. We are proud of our environmental performance and we aim to improve our scores further through stringent measures, especially on energy efficiency and resource efficiency. Most of our plants have zero liquid discharge

Further, we have also disclosed our climate risk and opportunity study under the TCFD framework (Task Force on Climate Related Financial Disclosures) for the year 2022-23 during the year current year.

This section details our environmental performance in the following aspects:

- Environmental Management
- Energy
- Climate Change
- Greenhouse Gas Emissions
- Avoided Emissions
- Water Conservation
- Life Cycle Assessment
- Solid Waste Management
- Circular Economy
- Biodiversity
- Air Quality
- Innovation

1. Environmental Management

As a responsible, company, GIL believes in corporate stewardship of environment. GIL nurtures a culture of conservation that emphasises meticulous monitoring of use of resources and encourages innovations that aid in reducing the dependence on natural resources. We are consistently striving to use technology in this journey of resource conservation, and we are also inspiring our supply chain to do the same. This is our way of reducing the life cycle adverse environmental impact of our products.

GIL's facilities are certified under the Integrated Management System (IMS), comprising ISO 9001 (Quality), ISO 14001 (Environment) and ISO 45001 (Occupational Health and Safety). We conduct regular surveillance audits and recertifications as required.

In addition to this external certification, we also carry out internal audit of our environment management system on a periodic basis to ensure continual improvement.

Few of the highlights of our environmental management during the year has been:

- ✓ Zero liquid discharge in our largest manufacturing plant in Durgapur.
- ✓ Reduction of overall energy intensity significantly thus helping us achieve major reduction in GHG emissions as well as cost
- ✓ Significant increase in renewable energy in use as compared to earlier years
- ✓ Significant reduction of high carbon intensive fossil fuels
- ✓ Significant reduction in both Scope 1 and Scope 2 GHG emissions intensity across the business. Our GHG data has been independently verified by credible global agency
- ✓ Initiation of accounting for Scope 3 GHG emissions for the entire business with an intent of managing it. Our GHG data has been independently verified by credible global agency
- ✓ Installation of Gate Modules in weighbridges at Durgapur thus ensuring accurate measurement of all materials (including waste) entering or existing the plant. This reduces the inaccuracies in measurement
- ✓ Major achievement in Sustainable supply chain initiatives to ensure, among other things, reduction of our supply chain GHG emissions intensity. Our systematic outreach has covered suppliers who collectively supply goods and services worth 90% of our annual purchases, both from international and domestic markets
- ✓ Biodiversity management – initiation of one of the best biodiversity projects – Mangrove plantations in the UNESCO world heritage site of Sunderbans. The environmental and social benefits of mangrove plantations are unmatched. The Sundarbans is of universal importance for globally endangered species including the Royal Bengal Tiger, Ganges and Irawadi dolphins, estuarine crocodiles and the critically endangered endemic river terrapin (Batagurbaska). It is the only mangrove habitat in the world for Panthera tigristigris species
- ✓ We have carried out Life Cycle Assessment (LCA) of our major product – Graphite Electrodes – and the results demonstrate that the environmental impact (life cycle) of our products is low as compared to that of the industry globally. The LCA report is available on our website

All of the above as well as much more are provided in detail in the following pages of this report.

2. Energy

GIL is committed to measuring, managing and reducing its energy consumption in line its objective to reduce its carbon footprint. We are glad to announce that we have successfully implemented several processes related to demand side as well as supply side related measures to reduce our energy consumption and also reduce the overall associated carbon emissions.

2.1. Energy Efficiency Measures

We manufacture Impervious Graphite Equipment (IGE) at ourAmbad facility in Maharashtra. This facility has taken a series of steps to curtail its carbon emission, especially through switching to cleaner and more efficient fuel, electrification of some logistics operations and undertaking retrofitting to increase energy efficiency of equipment.

- High Speed Diesel (HSD) was replaced by Piped Natural Gas (PNG) in Thermic Fluid Heaters, steam boilersand paint booth dryers. This led to a reduction of 60% in the consumption diesel at the Ambad plant. Further, PNG has several advantages including that it does not require storage facilities and is safer to use than HSD. Chance of spillage is also nil.
- HSD-operated forklifts were replaced by battery-operated forklifts, eliminating pollution.

Fig. Battery operated forklift

- Other energy efficiency measures:
  - Use of Variable Frequency Drives in higher KW motors (90/75KW) of dust collector.
  - Use of energy efficient motor (IE-3) for higher cap equipment of dust collector - 90KW.
  - Provision made for selective use of higher KW rating dust collectors (90KW/75KW/45KW/20KW) as per load requirement.
  - Provision made for using energy efficient air compressor (IE-3 MOTOR & VFD panel) for regular utility air.
  - Provision made for centralized air compressor to run at normal air pressure (7.0bar) and dedicated loop provided for high pressure (10 Bar) machines so that power consumed is optimum.
  - Efficient utilization of power by maintaining plant power factor to optimum level.
  - Use of air-cooled thermic fluid pump thereby avoiding power consumption of cooling tower.

- Installation of new CNC-Deep Hole drilling machine, CNC-Turning m/c, SPM Slotting machine & NC engraving m/c, Automatic Paint booth station. New CNC machines are equipped with IoT (Internet-of-Things) features.
- New high bay lamps in assembly & low bay light fixtures in tube shop are provided with motion sensors & auto-light-dimming facility.
- Old roof sheets of asbestos (cement sheets) are being replaced with MS coated sheets wherein transparent Polycarbonate sheets are provided for better illumination. This will reduce shop lighting load and comply environmentally friendly material use.
- Metal Roofing sheet was replaced with transparent polycarbonate at certain locations, leading to better lighting and energy efficiency.

Fig. Adjusted roofing for better lighting

The above measures led to a reduction of electricity consumption by 22% in 2023-24 at the Ambad facility.

At our POWMEX Steel manufacturing facility inTitlagarh, Odisha, we have reduced our energy consumption from 7,55,53,688 MJ from 7,82,56,420 MJ in the year. This was achieved primarily through the following actions taken:

- 30 rollers replaced in the Roller Hearth Furnace, leading to reduced breakdowns and efficient movement of materials.
- Further, the refractory lining in the reheating furnace and roller hearth furnace was repaired, preventing heat loss.
- Cleaning of scaling in the roller hearth furnace led to improved fuel efficiency.

In 2023-24 GIL had employed a leading global firm to conduct a thorough energy audit of all manufacturing locations. We are in the process of incorporating the key recommendations of the audit at our plants, with a view to further increase our energy efficiency.

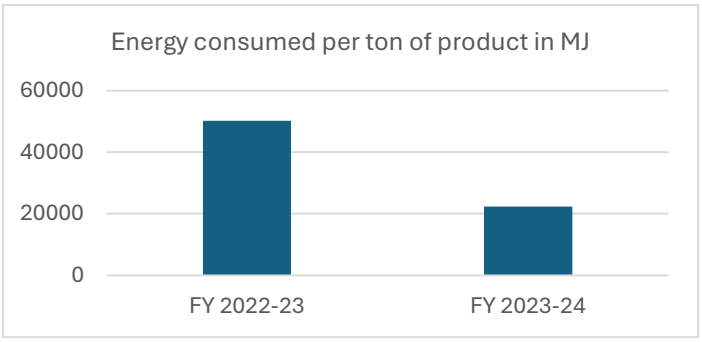
OurSatpur facility has entered into a power purchase agreement (PPA) with a renewable energy provider. A mix of solar and wind power will be supplied to the facility starting in 2024-2025. At Durgapur, we are entering into a arrangement with the energy utility company to provide us electricity generated from lower carbon sources and hope to have a higher share of low carbon energy supply in place from the year 2024-25.

In our Durgapur facility, we initiated several energy-saving measures, including:

- Installation of 4 nos. VFD drive in RH24-1, Acheson Unit 2 and LWG 5 resulting in cost saving of ₹ 17 lakhs per year
- Phase wise replacement of existing low efficiency Conventional lamps with LED lights (Energy Savings 2,68,584.6 KWH till March-2024). Cost savings of ₹ 15.53Lakhs were achieved.
- With improvement initiatives at graphitisation,we achieved energy savings of 130kWh/MT resulting into saving of ₹ 4.5 Crores.

2.2. Total Energy Consumption

The details of energy consumption of GIL in 2023-24 have been reported in our Business Responsibility and Sustainability Report for the year and available on our website as a part of our annual report. The impact of all our energy management initiatives is evident in the numbers. We achieved an overall energy intensity reduction of 56%

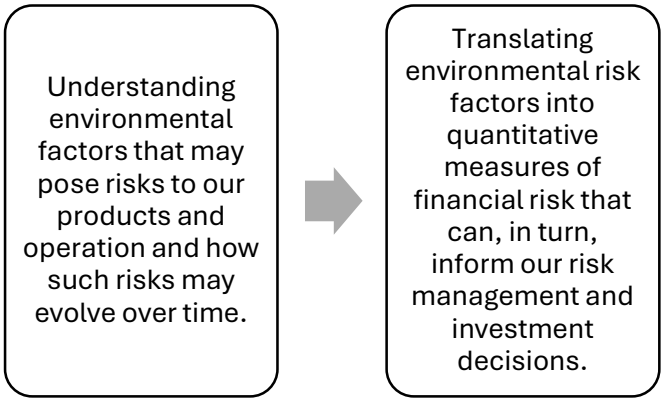


3. Climate Change

By climate change, we refer to the atmospheric changes directly or indirectly attributed to human activity that alters the composition of the global atmosphere. It is one of the most complex issues facing us today and involves many different dimensions – science, economics, society, politics and moral and ethical questions. It is a global issue with local manifestations (e.g. extreme weather events) and global impacts (e.g. global warming, rising sea levels). In order to ensure business continuity, adapting to actual or future climate events is essential.

It is important to analyse the extent to which environmental and climate-related impacts could affect our value chain – supply chain, operation and assets, logistics and market – which would have an impact on financial performance.

We understand that climate change adaptation and resilience measures require location-specific assessment of climate risks and suitable approaches to address them. Climate related risks and opportunities are being studied in detail at our several plant locations. Once we have developed the relevant metrices, our business strategy, taking into account the climate risks and opportunities will get developed.



Climate Risk Identification

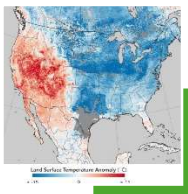
We had carried out a full fledged climate risk and opportunity study aligned to the recommendations of TCFD in the past. During the current year we have again carried out the climate risk and opportunity identification study to check if we have been able to manage the risks to a reasonable extent. The results of the study will be disclosed through our CDP 2024 participation (September 2024). :

In this study we have considered the risks in

(a) Our direct operations
(b) Our upstream (within India) – for imports, from the sea port inwards
(c) Our down stream (within India) – for exports, upto the sea port

Transition Risk

- Regulatory changes: Increased focus on climate change across governments around the world has led to introduction of stricter environmental regulations in recent years. We foresee regulations on GHG emissions in near future in line with the Government's commitment on reducing GHG emission. Also, increase in coal based electricity tariff in future can lead to significant increase in our operating cost.



Physical Risk

- Extreme weather: Considering our geographical presence near coastal area, extreme weather events associated with climate change (e.g. cyclone, flood) have the potential to threaten our business continuity. These include physical risks, such as damage to our facilities, leading potential disruption of our operations.

Addressing identified risks

Greenhouse Gas emission management	**Business continuity management**
Although our manufacturing operations are currently dependent on fossil fuel-based grid electricity as well as fuel oils, we have started replacing them with renewable energy and soon our overall energy mix will be much greener. We have entered into solar/wind hybrid energy procurement process in our Satpur factory and this is expected to replace grid power significantly at Satpur. We will extend this to our other factories gradually. We have started reducing fuel consumption in all factories and replacing them with less carbon intensive fuels. Details are in the GHG management chapter of this report. Besides this, we will be implementing rainwater harvesting at our factories to reduce dependency on ground water. These mitigation and adaptation efforts will continue in our efforts to manage the climate risk	To limit the impact of risks arising out of extreme weather events, we have our own business continuity management system in place which ensures continuity of operations or a return to service in the shortest time possible. Our uninterrupted operation during some of the recent cyclones (e.g. Amphan&Yaas) is testimony to our resilience and effectiveness of the control measures in place.

Integration of Climate Risk into Business Strategy

We understand the importance of building capabilities, processes, and governance to integrate climate risk into decision making and thus into the overall business strategy. At the same time, it is imperative that our climate risk strategy is consistent with the overall culture and goals of the organization. The integration into business strategy involves the following aspects:

We are aware of climate risk and evaluating the exact metrices at present.

Once we are ready with the impact evaluation and metrices, the investment required in R&D will be ascertained

The evaluation is in progress on how our several plant operations may get impacted

We expect the impact on all these elements of financial planning.

Revenues	**Direct Costs**	**Indirect Costs**	**Capital Expenditure**
			

Please refer to our Report based on TCFD recommendations for details of our climate risk/opportunity identification and steps we are taking to build resilience to this risk.

4. Greenhouse gas emissions

Graphite India Limited is steadfast in its commitment to environmental stewardship, particularly in the management and reduction of greenhouse gas (GHG) emissions. Adhering strictly to the GHG Protocol—the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions—our comprehensive approach ensures transparency and accuracy in reporting. During the year, we have made commitments to Science Based Targets Initiative (SBTi) to support global initiatives to reduce GHG emissions.

4.1. Scope 1 emissions

Our Scope 1 emissions include emission from burning fuel such as diesel for generator sets and various manufacturing processes, PNG, coal bed methane, fuel for fleet vehicles (petrol and diesel), etc. In 2023-24, GIL emitted 96999 tonnes CO2e (carbon dioxide equivalent).

Compared to 2022-23, we achieved a reduction of about 13% in our scope 1 emissions through various efficiency measures and switching to cleaner fuels, as highlighted in the previous chapter.

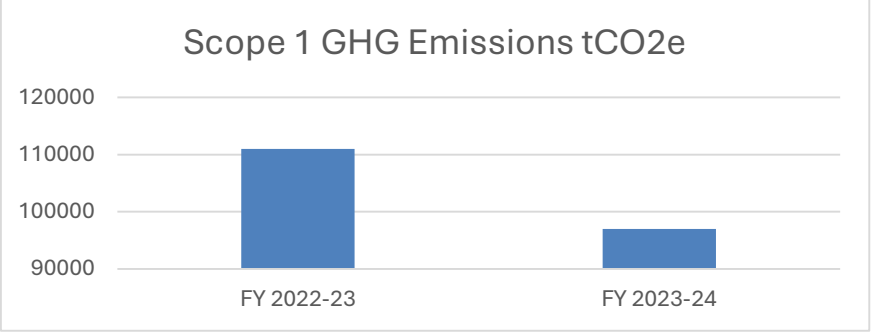


Fig. Comparison of Scope 1 emissions of GIL (current and previous reporting years) The data of both the years are verified by TUV India

4.2. Scope 2 emissions

Scope 2 emissions denote emissions from indirect sources, such as purchased electricity and other utilities. In 2023-24, our scope 2 emissions were calculated to be 2,56,024 tonnes CO_2e.

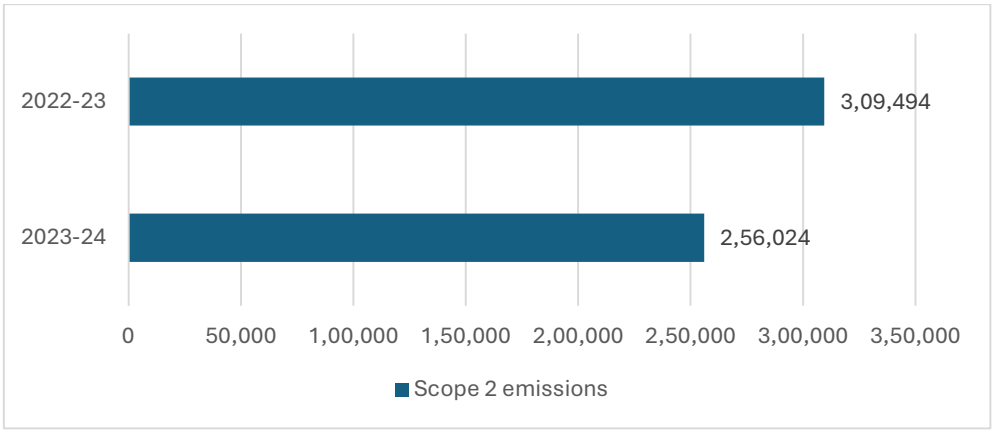


Fig. Comparison of Scope 2 emissions of GIL (current and previous reporting years) The data of both the years are verified by TUV India

We achieved a reduction of about 17% in our scope 2 emissions as compared to 2022-23 owing to sustained reduction in energy consumption values.

4.3. Scope 3 emissions

Scope 3 emissions arise from activities in the upstream and downstream value chain, often rendering it difficult to calculate or determine the scope. We have done a thorough assessment of our scope 3 emissions in the year 2023-24

The table below shows the emissions per category under scope 3. We have identified 6 categories defined by the GHG Protocol as the most pertinent for our calculations. We will now start initiatives to influence our stakeholders and try to reduce our scope 3 emissions. We have already started the process of engaging with our suppliers (from whom we procure about 90% of our goods and services by value) through outreach events in order to ensure that they manage their ESG attributes (including GHG emissions).

Category	Description	Emissions (tCO_2e) 2023-24
1	Purchased goods and services	143533
4	Upstream transportation and distribution	40949
6	Business travel	2837
7	Employee commuting	357
9	Downstream transportation and distribution	26188
11	Use of sold products	471840
	TOTAL for the year	**685704**

The data have been verified by TUV India

4.4. Emissions Intensity (Scope 1 and Scope 2)

Emission Intensity is an effective indicator of resource efficiency, as it throws lights on the carbon footprint per unit of product, or per Rupee of turnover, or other relevant units.

Total Scope 1 and Scope 2 emissions equal 3,40,674 CO_2e.

In 2023-24, GIL's emissions intensity was:

	2023-24 Emissions Intensity	2022-23 Emissions Intensity
Emissions Intensity per metric tonne of product	2.86 CO_2e/Metric Tonne	2.96 CO2e/Metric Tonne
Emissions Intensity per Crore Rupees of turnover	121.97 CO_2e/Crore Rupees	144.3 CO_2e/Crore Rupees

For details please refer our Business Responsibility and Sustainability Report for the year, which is on our website as a part of our annual report

5. Avoided Emissions

5.1. Graphite Electrodes used in Steelmaking

GIL is proud to contribute to the decarbonization of the steel sector in India. The graphite electrodes manufactured at our facilities are used by steel manufacturers using the electric arc furnace (EAF) route, which isless carbon-intensive than the traditional Blast Furnace-Basic Oxygen Furnace (BF-BOF) route. EAFs use a large proportion of scrap steel, reducing the overall carbon footprint of the steelmaking process, as compared to the BF-BOF route which involves emissions from mining of ores, inputs such as coal and coke, as well as iron smelting. The BF-BOF route uses 13-15 % scrap steel on an average, whereas in the EAF route the proportion can go as high as 70-90%, implying that the EAF route is more efficient and less carbon-intensive.

Assuming highest efficiency, approximately 2 kilograms of graphite electrode is consumed in producing 1 metric tonne of steel in the EAF route. In 2023-24, GIL produced approximately 68,000 tonnes of graphite electrode, which would be eventually utilized to manufacture 3,40,00,000 tonnes of low carbon steel.

The total quantum of avoided emissions, also known as Scope 4 (avoided emission outside company value chain, or due to product use), could not be estimated as the actual emissions from the EAF process varies widely with the scrap percentage and product requirements. However, it is estimated that the emissions from the steel sector globally could be reduce by about 17% as per some independent studies

5.2. Coal Bed Methane (CBM)

Our Durgapur facility utilizes coal bed methane (CBM) in the electrode manufacturing processes as fuel. The total greenhouse gas emission from this process is 22,803 tonnes CO_2e. However, methane has a global warming potential (GWP) of about 28, i.e. it is 28 times more potent than carbon dioxide as a global warming agent. Therefore, if the total CBM used by GIL were to be released into the atmosphere from coal beds, the resultant emissions would be 6,38,484 tonnes CO_2e.

6. Water Conservation

Water is the lifeblood of manufacturing processes due to its utilization in several processes, as a coolant as well as cleaning and dousing purposes. GIL is cognizant of the fact that water resources are dwindling across all states in India, and it would have an adverse impact on industry eventually.

To mitigate some of the risks associated with water depletion, we have taken various measures at our manufacturing facilities.

6.1. Zero Liquid Discharge

Water is used for cooling purpose in the process at Graphite India Limited, Durgapur. The output water from this system was usually drained out after required treatment. We installed a Zero Liquid Discharge (ZLD) system to prevent the disposal of this water and to reuse it. This also reduced ourconsumption of freshwater supplied by the Durgapur Projects Limited (DPL), thus conserving water for other purposes.

Fig. ZLD system in use

In the ZLD system, water is collected from the outgoing points and is pumped to the sedimentation tank. This water is then pumped to the multigrade filter for filtration and stored in storage tanks. The stored water is then supplied for use in the plant.

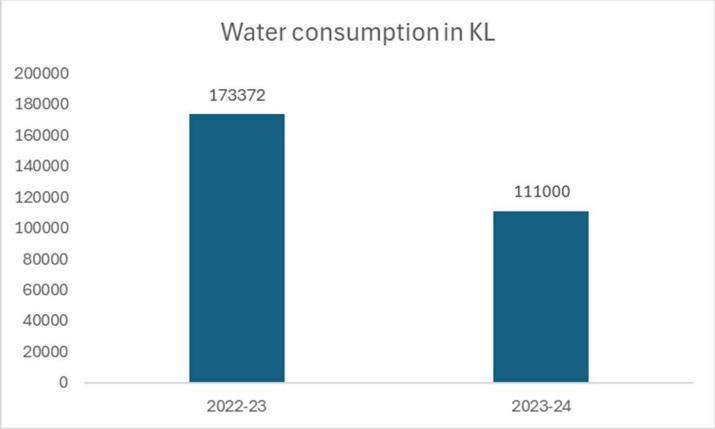


Fig. Comparison of water consumption (year-on-year)

With ZLD in place the city water consumption reduced from 475 KL/day in 2022-23 to 303 KL/day in 2023-24 (reduction by 37%).

6.2. Measuring water consumption digitally

What gets measured, gets managed. In line with this important adage, GIL has taken steps to accurately quantify its water consumption for various processes as well as outlets.

Further, at our Ambad facility, we were able to reduceannualwater consumption from 26,282KL (FY2022-23) to 19,707KL (FY2023-24). This reduction was achieved by a plethora of initiatives:

- Water leakages prevented from pipeline, taps, tanks.
- Section wise Water meter installed for to know consumption pattern.
- Underground, overground water storage tanks repaired/replaced.
- Utilization of treated wastewater for gardening andas flush water in toilets.
- Awareness conducted among all employees for optimum use of Water for Domestic and Industrial purpose

At our POWMEX Steel plant Titlagarh, Odisha, we achieved a reduced water consumption of 35,908.8 KL as compared to 53,520 KL in 2022-23 by the following initiatives:

- Water supply timing was fixed by installing 4 tanks at different locations to control water timing from the main Over Head Tank.
- Wall mounted Bib cock valves were replaced with Push button tapes to prevent water wastage.

6.3. Total water consumption

GIL reduced its total water consumption in 2023-24 through various conservation efforts. The table below shows the water used from various sources and how the values compare with the previous reporting period (2022-23).

Parameter	FY 2023-24	FY 2022-23
Water withdrawal by source (in kilolitres)		
(i) Surface water	1,90,602 KL	2,71,544 KL
(ii) Groundwater	51,769 KL	73,364 KL
(iii) Third party water	0	0
(iv) Seawater / desalinated water	0	0
(v) Others	0	0
Total volume of water withdrawal(in kilolitres) (i + ii + iii + iv + v)	2,42,371 KL	3,44,908 KL
Total volume of water consumption (in kilolitres)	2,42,371 KL	3,35,795 KL
Water intensityperrupeeof turnover (Total water consumption / Revenue from operations)	83.74 KL per crore of Rupee turnover	115.3 KL per crore of Rupee turnover
Water intensity in terms of physical output	**1.97** KL per metric ton	2.36 KL per metric ton

Table. Comparison of Water Consumption (2022-23 and 2023-24)

GIL achieved a reduction of 27.8 % in water consumption, as compared to 2022-23 levels. The process of water consumption reduction is ongoing and several initiatives are being undertaken in our plants. We believe that this progress in reduction of water consumption, both in terms of intensity as well as in absolute numbers will continue going forward.

7. Life Cycle Assessment (LCA)

A life cycle assessment (LCA) study was performed for our main product, synthetic graphite electrodes, to assess the environmental performance and product footprint. This study is a convergence of different operational aspects of Graphite Electrodes to meet the sustainability agenda and product standards. The study covers the Cradle to Gate approach by assessing different life cycle stages i.e. raw material extraction, upstream transportation of raw material and fuel, manufacturing and finishing of the product till manufacturing plants' out-gate.

LCA is a standardized methodology, which makes it reliable and transparent. The International Organization for Standardization (ISO) provides standards for LCA in ISO 14040 and 14044. These standards describe the four main phases of an LCA:

1. Goal and scope definition

2. Inventory analysis

3. Impact assessment

4. Interpretation

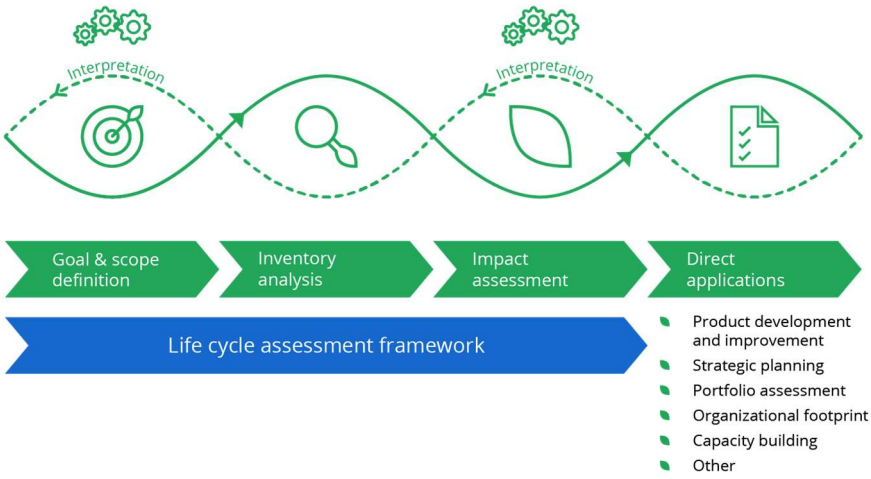


Fig. LCA approach

Graphite Electrodes are manufactured in the Durgapur and Satpur factories. These two were chosen as the study area for life cycle inventory analysis. Graphite electrode is an essential requirement for electric arc furnaces (EAF) primarily into steel production from scrap to reduce the CO_2-emissions. With the growing consciousness of the world towards a low carbon future, a paradigm shift is of utmost importance considering sustainable resource and energy consumption.

The study considers the raw material extraction stage, upstream transportation of raw materials and fuels, and the manufacturing which includes consideration of energy inflow and outflow through emissions at different life cycle stages followed by finishing. The usage stage and end of life treatment of the product considered is out of the scope of this study. The schematic process flow diagram is depicted in the following figure. The CML method has been chosen as the main environmental impact assessment method for this study are: Abiotic Depletion, Acidification Potential, Eutrophication Potential, Freshwater Aquatic Ecotoxicity Potential, Global Warming Potential, Global Warming Potential excluding biogenic carbon, Photochemical Ozone Creation

Potential, Ozone Layer Depletion Potential and Primary energy demand from renewable and non-renewable resources.

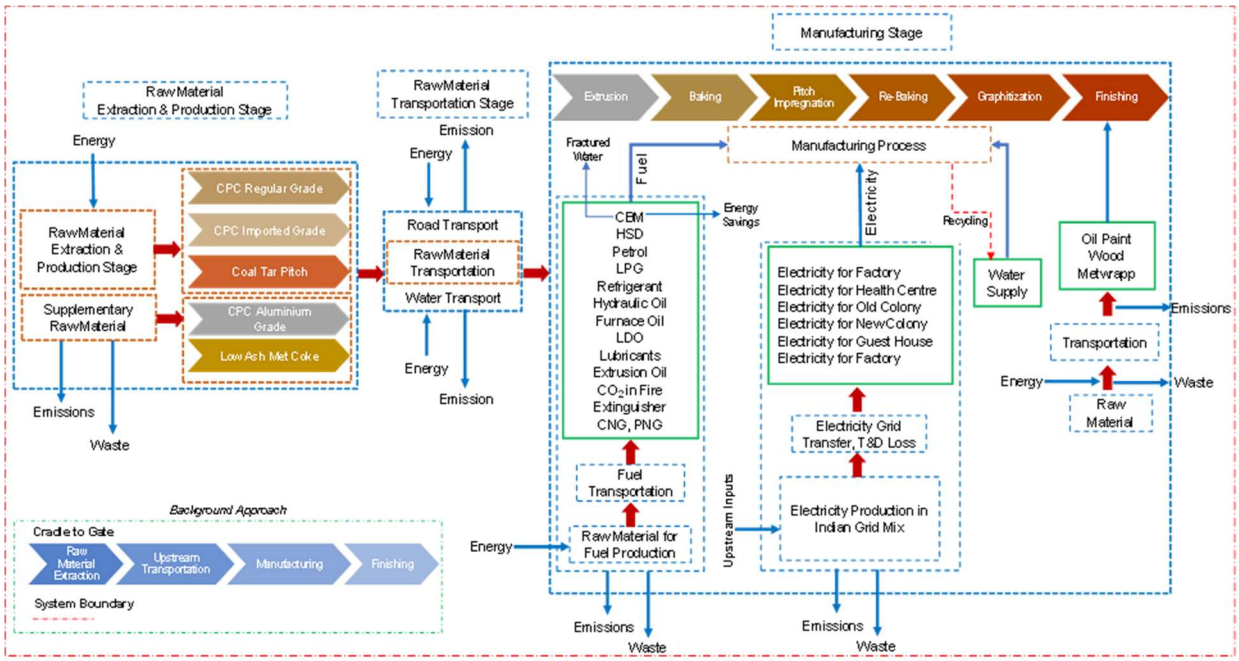


Fig. Schematic Diagram of "Cradle to Gate" System Boundary of Graphite Electrode

The result of the LCA indicated a net 118.78% of resource saving potential, which is the positiveattributional impact element in regard to the sustainable consumption of waste product. Estimated carbon footprint (as GWP) for 1kg graphite electrode manufacturing is 1.763 kg CO_2e. However, the carbon footprint for total raw material extraction stage is found to be 0.828 kg CO_2e for 1 kg graphite electrode production. The usage of Calcined Pet Coke (CPC), which is a petroleum by-product tends to net savings in Abiotic Depletion Potential (Resource) for this stage which envisage sustainable consumption. Besides, an understanding of the significant share of impact indicators, such as GWP, POFP, ODP, HTP, MAETP, FAETP, etc., is provided by grid electricity consumption. This provides a framework for methods aimed at minimizing the use of non-renewable energy sources and adoption of more renewable sources.

During this life cycle evaluation, the sustainable use of Coal Bed Methane and Natural Gas as a fuel prevented the depletion of natural resources like methane as well as a massive quantity of emissions that have the potential to have an even greater negative impact on global warming than CO_2. In terms of GWP potential, over 68% of GHG emissions have been reduced, and in terms of photochemical oxidant generation, 45.72%. These results provide insight into the sustainability of the product and align with the global climate risk mitigation plan aimed at achieving net zero targets.

Carbon footprint-wise, based on publicly available comparable data, we can proudly claim that GIL is one of the most efficient synthetic graphite electrode producer in the world.

8. Solid Waste Management

GIL is steadfast in measuring and reducing waste production and disposal to landfill.

To promote better accounting of waste generation and waste related logistics, we have implemented a software module that helps us collect data directly from the weigh bridges that measure waste amount transported by trucks. This helps eliminate human error from the data collection and estimation of the amount of waste generated and/or transported.

Details of our total waste quantity across various categories as well as a comparison with the previous reporting year is provided in the table below:

Parameter	***FY 2023-24***	***FY 2022-23***
Total Waste generated (in metric tonnes)		
Plastic waste ***(A)***	214.096 MT	340.6 MT
E-waste ***(B)***	0.48 MT	3.03 MT
Bio-medical waste ***(C)***	0.21 MT	0.05004 MT
Construction and demolition waste ***(D)***	3.25 MT	3.7 MT
Battery waste ***(E)***	4.584 MT	4.598 MT
Radioactive waste ***(F)***	Nil	Nil
Other Hazardous waste. Please specify, if any. ***(G)***	1193.075 MT (Used oil or waste oil, ESP tar, ETP Sludge, Paint sludge etc.)	723.6 MT (Used oil or waste oil, ESP tar, ETP Sludge, Paint sludge etc.)
Other Non-hazardous waste generated ***(H).*** *Please specify, if any.* (Break-up by composition i.e. by materials relevant to the sector)	31,084.703 MT (Mainly carbonaceous material, Graphite powder and broken pcs, scrap wood, steel scrap, etc.)	45,853 (Mainly carbonaceous material, Graphite powder and broken pcs, scrap wood, steel scrap, etc.)
Total (A+B + C + D + E + F + G + H)	32500.398 MT)	46928.578 MT

Table. Comparison of Waste Generation (2023-24 and 2022-23)

We achieved a reduction of over 30% in our waste generation, as compared to 2022-23. We witnessed a reduction in our waste generation intensity as well, as shown in the table below.

Parameter	FY 2023-24	FY 2022-23
Waste intensity per rupee of turnover(Total waste generated / Revenue from operations)	11.23 MT of waste per crore of Rupee Turnover	16.10 MT of waste per crore of Rupee Turnover
Waste intensity in terms of physical output	0.26 metric tonnes of waste per metric ton of product	0.32 metric tonnes of waste per metric ton of product

For each category of waste generated, we also account for the total waste recovered through recycling, re-using or other recovery operations, and the waste quantity that incinerated, landfilled or disposed through other means. The details are provided below:

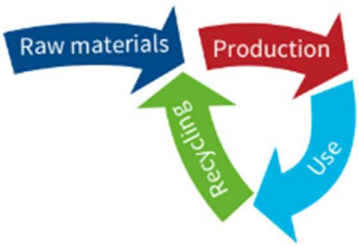
Parameter	FY 2023-24	FY 2022-23
Category of waste		
(i) Recycled	2,904.561	4,645.4 MT
(ii) Re-used	8.92	7.9 MT
Total	**2913.481**	**4,653.3 MT**
Category of waste		
(i) Incineration	5,141.6 MT	4.17 MT
(ii) Landfilling	48.53 MT	34.63 MT
(iii) Other disposal operations	29,878.713 MT	46,273 MT
Total	**35,068.843 MT**	**46,311 MT**

Table. Comparison of waste disposed and diverted from landfill (2022-23 and 2023-24)

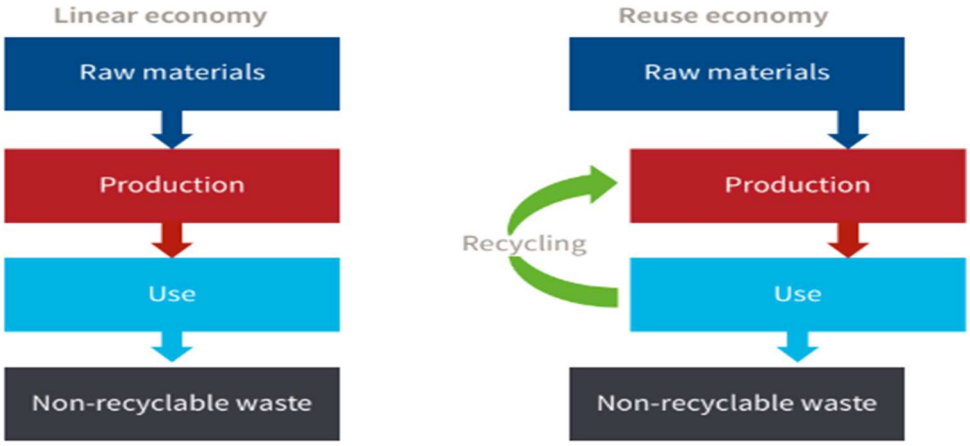
Out total waste disposal stood at 35,068 Metric Tonnes in 2023-24, a reduction of about 24% as compared to the previous year. This was achieved by improving process efficiencies and reducing waste generation at source. We also recycled and reused 2,913 tonnes of waste.

9. Circular Economy

To manage the impact of waste generated in our operations, we at GIL have focussed on efficient disposal and management of waste, in addition to reducing the generation of waste. In this regard we are striving to achieve a circular business model as we progress on our journey of sustainable growth. The circularity model aims to avoid waste and to preserve the value of resources (raw materials, energy and water) for as long as possible. It is an effective operational model to assess and manage the operations and resource management and is an alternative approach to the harmful use-make-dispose (linear) model.



The circular business model aims to eliminate waste generation totally by reusing/recycling the entire waste generated. At present, such a model is aspirational to us. However, we are already implementing a Reuse model in our operations, while minimizing the non-recyclable waste generated.



Reuse Waste

Wherever possible, recovery or recycling is done.

Intermediate process scrap like Green Scrap, Crushed Baked scrap and CPC fines are reused in the electrode manufacturing process, following due SOP.

Installation of plant to treat human wastes and use the processed waste as manure in garden

Recycle Waste

- Whenever possible, products, treated water & waste are recycled back into the production line.
- Disposal of contaminated packaging is done through Government authorized agencies in accordance with applicable laws, regulations and material characteristics at time of disposal.

10. Biodiversity

Biodiversity, land-use and associated ecosystems provide a range of invaluable services to society that underpin human health, well-being and economic growth. Ecosystem services are the benefits that people, including businesses, derive from ecosystems. In 2019, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) published a landmark report, which showed that around one million animal and plant species are now threatened with extinction, many within decades, more than ever before in human history.

To save the ecosystem, we at GIL, are taking the necessary steps so that our activities do not harm the ecosystem. We are taking steps to ensure that the noise levels in our operations are within the safe range, the land used for our operations do not degrade over time, and the emissions of our activities are well within control. We have a provision of acoustic enclosures to minimise noise levels from multifuel power generating sets and a bimonthly testing check. We are also committed to not operate in World Heritage areas and IUCN Category I-IV protected areas.

10.1. Mangrove Plantation Initiative

GIL has initiated Mangrove Plantation project in the Sundarbans Areaof West Bengal with pilot scale initial investment on a 4 hectares land. Depending on how the plantations survive and provide benefits, the investment may be scaled up.

Mangrove plantations offer a range of environmental and social benefits, which are critical for sustainable development and ecosystem preservation. Here are some key points highlighting these benefits:

Environmental Benefits

1. Carbon Sequestration

- Mangroves are highly effective at absorbing carbon dioxide from the atmosphere. They store carbon in their biomass and soil, significantly contributing to the mitigation of climate change.

2. Coastal Protection

- Mangroves act as natural barriers against storm surges, hurricanes, and tsunamis. Their dense root systems stabilize shorelines, reduce erosion, and protect coastal communities from natural disasters.

3. Biodiversity Conservation

- Mangrove ecosystems are rich in biodiversity, providing habitat for a variety of species, including fish, birds, and invertebrates. They serve as nurseries for many marine organisms, supporting fisheries and maintaining ecological balance.

4. Water Quality Improvement

- Mangroves filter pollutants and sediments from water, improving water quality and protecting coral reefs and seagrass beds from sedimentation and pollution.

5. Soil Formation and Stabilization

- The roots of mangroves trap sediments and organic matter, contributing to soil formation and maintaining land integrity in coastal areas.

Social Benefits

1. Sustainable Livelihoods

- Mangroves support fisheries and aquaculture, providing food and income for local communities. They also offer opportunities for ecotourism, which can be a sustainable source of revenue.

2. Climate Resilience

- By protecting coastal areas from erosion and natural disasters, mangroves help communities adapt to the impacts of climate change, enhancing their resilience.

3. Cultural Significance

- Many coastal communities have cultural and spiritual connections to mangroves. These ecosystems often play a role in traditional practices and heritage, reinforcing community identity and social cohesion.

4. Educational and Research Opportunities

- Mangrove ecosystems offer valuable opportunities for scientific research and environmental education, fostering greater understanding and awareness of ecological and climate issues.

5. Health Benefits

- Mangroves contribute to cleaner water and air, which can lead to improved public health outcomes for communities living nearby.

The pictures below show our mangrove plantation in progress. It will take time for the plants to grow up and start providing the environmental and social benefits


11. Air Quality

GIL is meticulous in measuring and monitoring its air emissions or pollutants, as mandated by the central and state Pollution Control Boards.The table shows the emission levels for SOx, NOx and other pollutants and particulates for 2023-24 as well as a comparison with the values from the previous reporting year.

Parameter	***Unit***	***FY 2023-24***	***FY 2022-23***
NOx	Kg/year	230420	254940
SOx	Kg/year	234009	223090
Particulatematter(PM)	Kg/year	377808	445678
Hazardousairpollutants (HAP)	Kg/year	39.6	41.5

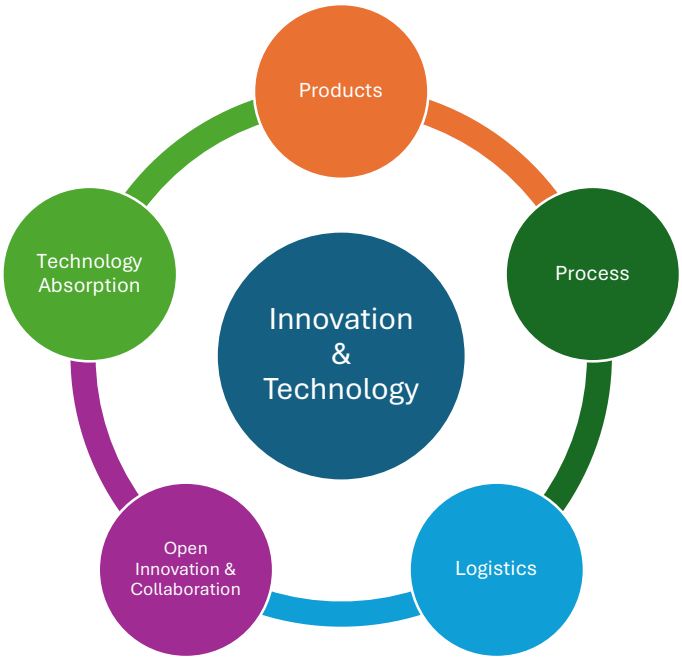
Table. Comparison of air emissions other than GHG (2023-24 and 2022-23)

The above emission data is authenticated by independent third-party service providers.

12. Innovation and Technology

As one develops ideas, they move from an initial flash of possibility into something larger, more specific, and more focused. Rather than remaining potential, an innovation – a new "product, service or process" – solves a real problem. In fact, we feel that innovation drives the world economy as people and businesses will always have problems to solve. Going by the same ethos, we have continued to focus on coming up with innovative products since inception to solve some of the most relevant problems in today's world.

Our innovations span across the entire life cycle of the products (design phase, use phase, end-of-life), the process of product development, the logistics, collaborations and partnerships with external institutions. Additionally, we have acquired cutting-edge technologies for enhancing the products and services further as listed below:



Benefits derived

- Reduction in specific energy consumption
- Conservation of resources
- Improved product quality
- Reduced environmental pollution
- Cost saving
- Reduction in human efforts
- Reduction in cycle time to improve delivery and reduce WIP

Product Innovation:

- At GE Division Durgapur, Nipple processing through LWG#3 instead of Acheson furnace resulting in reduction of specific Energy Consumption.
- At GE DivisionSatpur, Reduction in Specific energy consumption in the LWG graphitization process through optimization of Firing codes and inputs.
- At GE DivisionSatpur, Increased graphitization productivity by 0.2 MT/Hr through Parallel firing arrangement in Mould products
- At GE Division Durgapur, Incorporation of 120KA booster Rectifier for LWG#4&#5 for power optimization & energy savings.
- Old Recirculating furnaces have been replaced by new energy efficient Riedhammer furnaces for Baking of products.

- Three Dimensional Co-ordinate measuring machine (CMM)installed for Electrode & Nipple thread profile measurement and analysis.

Process Innovation:

- At GE Division Durgapur, In pitch Impregnation Section #2 & #3 compressed air replaced by liquid Nitrogen.
- At IGE DivisionAmbad, Low KW rating dust collector (old Digilog make-45KW) revamped and put to use in as an alternative for 90KW dust collector during low peak hours.
- At IGE DivisionAmbad, Phase wise replacement of lighting fixtures (conventional HPMV/HPSV) by energy efficient LED lamps.
- At IGE DivisionAmbad, Use of air-cooled thermic fluid pump thereby avoiding power consumption of cooling tower.
- At Coke DivisionBarauni, Enhanced insulation of the Rotary Kiln using superior quality refractory bricks, which decreases retention time and minimizes carbon loss by increasing Kiln RPM.
- At IGE DivisionAmbad, Converted HSD based thermic fluid heaters (02No) & Steam boilers (02No) to PNG fuel.
- At IGE DivisionAmbad, Replaced diesel operated Forklift-3Ton with battery operated forklift.
- At GE DivisionSatpur, 5 out of 9 WTGs commissioned and RE power generation started
- At GE DivisionSatpur, Pipe natural Gas usage against fossil fuel has been fully commissioned in Nashik premises.

Open Innovation:

- At IGE DivisionAmbad, Initiated the project of re-installation of roof top solar power (from GIL-Satpur) to Ambad unit (400KW cap).
- At GE Division Durgapur, Proposal for Roof top/Ground mount solar panel as alternate source of Energy
- At GE DivisionSatpur, Enhancing Hydro and solar energy capacity has been approved by the Board.

Technology Absorption:

At GE Division Durgapur:

- Liquid pitch handling system in PI-2 & PI-3
- Two number of Truck Loader for By-product fines loading in trucks.

At GE DivisionSatpur:

- Positive validation of Specialty product application by successful development of parts for pump and motor industry

- Reduction in Energy by replacing Water Ring Vacuum pump to Screw type Vacuum Pump.
- DISA (Fume entrapment system) introduced for reduction in emissions.
- Venturi scrubber commissioned in PI system for smoke reduction.

At IGE DivisionAmbad:

- Installation of new SPM Slotting machine thereby reducing jobs handling at multiple machines.
- Data management software installed in impregnation section for easy recording and avoiding cumbersome documentation.

At Coke DivisionBarauni

- Installation of Variable Frequency Drives to minimize energy loss during transmission.
- Continuous monitoring of O2, CO2, SO2, and CO levels in the Rotary Kiln to maintain optimum air levels.
- Regular shift-wise monitoring of current load on key equipment to optimize usage and prevent overload.

The table below shows the percentage of R&D and capital expenditure in specific technologies to improve the environmental and social impacts of products and processes out of total R&D and capex investments made by GIL respectively.

	FY 2023-24	**FY 2022-23**	**Details of improvements in environmental and social aspects**
R&D	0.44%	1.28%	• Satpur- Starting of RH 24-II furnace, Dust collector system improvement, PNG startup in place of oil, Wind power project • Ambad: PNG line project, battery operated fork truck installation for Dust Collector. • Durgapur: Dust collector for old extrusion charging, effluent treatment and recycling plant,ETP for PI3, RH24 automation etc.
Capex	37.5%	31.57%	

Table. R&D and capex investment

II. Social

GIL is committed to upholding social equity and human rights, among all stakeholders. Our employees and workers are at the core of our business—promoting their rights and wellbeing is a duty that GIL gladly conducts.

We also engage with our suppliers and customers to jointly perform better on sustainability. We have, during the year, focused on making our social and human resources policies and processes more appropriate.

In this section we cover our social sustainability performance for the year 2023-24, with focus on the following aspects:

- Stakeholder engagement
- Health and safety
- Training and development
- Employee engagement
- People, Diversity and Inclusion
- Performance Appraisal, Incentives and Rewards
- Attrition
- Supply Chain

13. Stakeholder Engagement

Stakeholders play an integral role in GIL's journey and we recognise the need to partner with them and understand their concerns to deliver the targets which we have set for ourselves. Our process of stakeholder engagement involves identifying key internal and external stakeholders followed by analysing the impact of each stakeholder groups on our business and vice versa.

Stakeholder group	**Whether identified as vulnerable & marginalised group**	**Channels of communication (Email, SMS, Newspaper, Pamphlets, Advertisements, Community meetings, Notice Board, Website) Others**	**Frequency of engagement (Anually/Half yearly/Quarterly/other)**	**Purpose and scope of engagement including key topics and concerns raised during such engagements**
Communities	Yes	Physical meeting with people	Regular	CSR Activities
Shareholders	No	Website, General Meetings, email	Quarterly	Company performance
Employees and workers	No	Notice Boards and physical meetings	Regular	EHS, Quality, productivity matters.
Customers	No	Marketing visit, emails	Regular	Product performance, technical and commercial discussions.
Suppliers	No	Physical/Virtual meetings and emails	Regular	Quality and timely delivery of material

13.1. Community Engagement and CSR

GIL has ongoing community engagement efforts at all locations, particularly through our corporate social responsibility (CSR) initiatives. In 1995, in memory of the late philanthropist Shri B. D. Bangur, we had created the B D Bangur Endowment to transform lives through sustainable support systems.

The endowment focuses on rural development, water and sanitation, education, environment, etc. The details of the activities can be found here.

Below are the details of some of the activities undertaken by the endowment in 2023-24.

Project: Medical Equipment for Healthcare

Location: Nashik

Description: Ambulances and other essential equipments were donated to healthcare facilities in Nashik. This initiative enhances hospitals' ability to cater to a broader community.

Project: Environmental Sustainability

Location: Nashik

Description: A water fountain was installed near Manas Hospital to promote urban greenery, reduce air pollution, and lower ambient temperatures. This initiative benefits the general public, including passersby and road users, by enhancing the local environment and improving air quality.

Project: Education on Wheels

Location: Kolkata, Durgapur, and Nashik

Project: Education on Wheels
Location: Kolkata, Durgapur and Nashik

Description: The initiative involves 2 Education on Wheels (EOW) buses in each of the following locations: Kolkata, Durgapur, and Nashik. These mobile classrooms currently serve: • 144 students in Kolkata • 69 students in Durgapur • 180 students in Nashik The program offers ongoing classes and raises awareness on essential life skills and adult literacy, significantly improving educational access and empowering communities through knowledge and skills development.	

	- 
Project: Education on Wheels Location: Kolkata, Durgapur and Nashik	Project: Education on Wheels Location: Kolkata, Durgapur and Nashik


Project: Livestock Sheds with Low-Cost Housing for Livelihood Generation

Location: Durgapur

Description:

This initiative provided 25 beneficiaries with livestock, including goats, hens, and ducks, to support livelihood generation through livestock distribution. The project aims to improve economic stability for these individuals by enabling sustainable income sources and enhancing their quality of life through low-cost housing and animal husbandry.


Project: Low-Cost Housing for Marginalized Communities

Location: Kanksa Block, Durgapur, West Bengal and Igatpuri Block, Nashik, Maharashtra

Description: In Kanksa Block, Durgapur, West Bengal, 25 durable 375 sq. ft. RCC roofed houses were built for marginalized individuals during 2023-24. Additionally, in Igatpuri Block, Nashik, Maharashtra, 42 sturdy 300 sq. ft. RCC roofed houses were constructed, with another 83 houses currently under construction. This initiative aims to provide safe and secure housing for marginalized communities, significantly improving their living conditions and quality of life.

Project: Drinking Water Kiosks for Safe Drinking Water

Location: Kolkata, Durgapur, and Nashik

Description: To ensure access to safe drinking water, 11 Water ATMs have been installed in collaboration with Kolkata Police and Kolkata Municipal Corporation. In Durgapur, 2 Water ATMs have been set up with the Durgapur Municipal Corporation. In Nashik, 16 Water ATMs are strategically placed at Ambad Hospital, NMC hospitals, Ambad Police Station, NMC schools, and Zilla Parishad.

This initiative benefits a wide range of people, including passers-by at major public transport hubs, office workers, public service employees, and hospital visitors, providing them with reliable access to clean and safe drinking water.

Project: Supplementary Education and Vocational Training

Locations: Kolkata, Durgapur, & Nashik

Supplementary Education: We offer specialized coaching in English, Science, Mathematics, Computer Skills, and Art & Craft to benefit local children aged 6 to 16. Our goal is to empower the community by enhancing the educational foundation of its youngest members.

Vocational Training: Our skill-specific vocational courses are designed to equip community children, women, and youth with the technical and non-technical expertise needed to become self-employed or gain employment. Currently, we offer the following courses:

- Beauty Therapist
- Sewing Machine Operator
- Data Entry Operation with Advanced Excel Knowledge

Current Enrolments:

- **Nashik:** 30 students in Supplementary Education and 27 in Vocational Training.
- **Durgapur:** 62 students in Supplementary Education and 60 in Vocational Training.
- **Kolkata:** 70 students in Supplementary Education and 60 in Vocational Training.

Project: Graffiti Wall Art

Location: Kolkata

Topic: Environmental Awareness & Education

Description: The Graffiti Wall Art project in Kolkata transforms some city walls into vibrant canvases to raise awareness about environmental issues. By combining artistic expression with educational themes, this initiative aims to inspire community engagement and foster a cleaner, more beautiful urban environment. The project not only beautifies public spaces but also serves as a powerful visual reminder of the importance of environmental stewardship, making a significant contribution to the city's sustainability goals.

Project: Just Bin It

Location: Nashik

Topic: Environmental Awareness and Hygiene

Description: "Just Bin It" is an initiative in Nashik focused on enhancing environmental awareness and promoting hygiene. The project educates the community on proper waste management through workshops, clean-up drives, and educational campaigns. By emphasizing the importance of reducing, reusing, and recycling waste, "Just Bin It" aims to foster a cleaner, healthier environment and improve the quality of life for Nashik's residents.

Project: Supplemental Education and Life Skills

Locations: Kolkata, Durgapur, Nashik

Topic: Best Out of Waste

Description: The project focuses on teaching children and community members the art of creating compost from kitchen and other organic waste. This initiative aims to reduce waste, promote recycling, and impart valuable life skills. By transforming waste into nutrient-rich compost, the project supports environmental sustainability and educates participants on the benefits of organic waste management. This hands-on approach not only fosters eco-friendly habits but also contributes to a greener, cleaner community.

14. Health and Safety

GIL is dedicated to maintaining a safe and healthy environment at all our campuses and project locations. We strive as a company to guarantee that every task, job, or project is conducted safely. We also extend our safety protocols to contractors at our facilities and advocate for our suppliers to implement similar safety management systems at their sites.

We have a state-of-the-art health and safety management system that has been implemented across all locations of GIL, ensuring timely trainings, checks and evaluations of procedures.

Safety Incident/Number	Category*	FY 2023-24	FY 2022-23
Lost Time Injury Frequency Rate (LTIFR) (per one million-person hours worked)	Employees	**1**	**1**
	Workers	**1**	**3**
Total recordable work-related injuries	Employees	**2**	**0**
	Workers	**9**	**9**
No. of Fatalities	Employees	**0**	**0**
	Workers	**1**	**0**
High consequences work-related injury or ill-health (excluding fatalities)	Employees	**0**	**0**
	Workers	1	0

*Including the contract workforce

We have conducted several safety trainings and awareness programs in this reporting year (2023-24). National Safety Week (4 – 11 March) was celebrated at all locations with vigour. Seminars and workshops of safety, climate change, and other pertinent issues were held.

Many events were organized at the Ambad facility, such as Safety oath taking ceremony, safety slogans, posters making, safety poems & songs, skits, drawings, blood donation camp, health awareness talks & mock drills. On the finale of National Industrial safety week ceremony the Chief Guest, Mrs. Anjali Ade, Joint Director of Directorate of Industrial Health & Safety, Nashik Region guided all employees on Industrial Safety. Winners of the above-mentioned competitions were felicitated by Mrs. Ade.

Fig. Winners of Safety Week competitions felicitated by Mrs. Anjali Ade

Fig. Oath taking ceremony on the occasion of National Safety Week

An awareness program on climate change was held in collaboration with the Energy Swaraj Foundation. The Solar Man of India, Mr C.S. Solanki, who helms the foundation, delivered this workshop. A Climate Clock was also installed, serving a constant reminder to all stakeholders about the impending impacts of climate change on us.

Fig. Climate Clock inauguration with Mr C. S. Solanki, the Solar Man of India

Further, a blood donation camp and fire-fighting training was also held during the Safety Week at Ambad.

Fig. Fire-fighting training during Safety Week (2024)

Fig. Blood Donation camp

Our Durgapur facility has also held several events in 2023-24 on health, safety and environmental awareness. A health check camp was organized for all employees at the GIL Durgapur, with good participation from our colleagues.

Fig. Snapshots from the health camp at GIL, Durgapur

A lot of emphasis has been placed on fire safety at all our manufacturing facilities. At Durgapur, we have installed a modular fire suppression system that is fully automated. The system will detect fire and spray chemicals to supress fire based on the location and fire type.

Fig. Automated Fire Suppression System

We have also installed a transformer fire protection system. When the system detects smoke it will release the transformer oil safely and replace it with Nitrogen gas charge, which is inert and will prevent the spread of the fire.

Fig. Transformer Explosion and Fire Control System

We are proud to declare that in 2023-24 there has been no complaintsrecorded from employees on health and safety.

	FY 2023-24			FY 2022-23		
	Filed during the year	**Pending resolution at the end of year**	**Remarks**	**Filed during the year**	**Pending resolution at the end of year**	**Remarks**
Working Conditions	0	0	0	18	0	0
Health & Safety	0	0	0	4	0	0

15. Training and development

Graphite India strongly believes in Learning and Development through structured training processes as the key to enhance growth and to embed ESG values and policies in the normal working of the company. To this extent the Company has done the following:

- Has drawn up a training calendar where important ESG principles like, containment of GHG emissions, Recognition and protection of Human Rights of employees and external stakeholders, Equal Employee opportunity policy, Health and safety measures, Skill enhancement, Business ethics etc appear as contents of such training
- The coverage of such training is extended to the maximum possible workforce, both in manufacturing sites and at HO/ other offices. It may be mentioned all the outsourced workers are invited for training on relevant topics.
- The periodicity of the training is done to optimize its impact, where health and safety training is most frequent.
- The trainings are done in a manner that they encourage participation for appropriate knowledge transfer
- Awareness outreach to our supply chain partners on relevant ESG topics

Employees receive both on the job training and professional development courses as required by job description or as deemed fit by the departments.

	FY 2023-24					FY 2022-23				
		On health & safety measures		On skill upgradation			On health & safety measures		On skill upgradation	
Category	**Total (A)**	**No(B)**	**% B/A**	**No (C)**	**%C/A**	**Total (A)**	**No(B)**	**% B/A**	**No (C)**	**%C/ A**
Employees										
Male	775	608	78	613	79	779	600	77	595	76
Female	22	13	59	12	55	19	7	37	7	37
Total	**797**	**621**	**78**	**625**	**78**	**798**	**607**	**76**	**602**	**75**
Workers										
Male	901	901	100	901	100	919	919	100	561	61
Female	5	5	100	0	0	3	3	100	0	0
Total	**906**	**906**	**100**	**901**	**100**	**922**	**922**	**100**	**561**	**61**

Table. Training on health and safety and Skill Upgradation (comparison – 2022-23 and 2023-24)

GIL also provides specialized training to employees based on their functions within the management (or job role, in case of workers). The table below provides the details of such trainings conducted in 2023-24.

Segment	Total no of training & awareness programmes held	Topics/principles covered under the training and its impact	% of person in respective category covered by the awareness programmes
Board of directors	4-As part of board meetings	During the year the board engaged in various updates pertaining to business, regulatory, safety, ESG matters etc.These topics provided insights on all the 9 principles	100
Key Managerial Personnel	1	Toxic thinking	100
Employees other than BoDs and KMPs	155	Health, Safety, EMS, QS, OHS, LOTO, General awareness, Effective Communication, Human Rights, etc	60
Workers	192	Health, Safety, EMS, QS, OHS, LOTO, General awareness, Discipline etc	70

Table. Training details of 2023-24

16. Employee Engagement

GIL strives to ensure that all employees are able to work in a conducive atmosphere, and feel supported in their work and professional development. We have organized several events and seminars, including those mentioned in the previous sections, as well as programs that have co-benefits for the employees and the environment and society.

In 2023-24, we organized a forestry initiative where employees planted trees to encourage the growth of planted and forested areas on and around plant premises.

Fig. Forestry Initiative at GIL, Durgapur

We also engage employees during National Safety Week and other occasions through prizes and felicitations for their good work and contributions to GIL's growth. We have a "Employee of the Month" award for upholding safety and other awards related with poster competition, slogan competition, etc.

Fig. Safety Award (Employee of the Month)

Fig. Prize distribution for Slogan Competition

17. People, Diversity and Inclusion

GIL strives to hire and nurture the best talent and ensures adequate support to all employees and workers for their growth and professional development.

The tables below showcase the wellbeingbenefits provided to our employees and workers, in terms of total numbers.

Category	% of employees covered by											
	Total (A)	Health insurance		Accident insurance		Maternity benefits		Paternity Benefits		Day Care facilities	
		Number (B)	% (B / A)	Number (C)	% (C / A)	Number (D)	% (D / A)	Number (E)	% (E / A)	Number (F)	% (F / A)
Permanent employees											
Male	775	775	100	775	100	0	0	0	0	0	0
Female	22	22	100	22	100	22	100	0	0	0	0
Total	**797**	**797**	**100**	**797**	**100**	**22**	**100**	**0**	**0**	**0**	**0**
Other than Permanent employees											
Male	40	40	100	40	100	0	0	0	0	0	0
Female	2	2	100	2	100	2	100	0	0	0	0
Total	**42**	**42**	**100**	**42**	**100**	**2**	**100**	**0**	**0**	**0**	**0**

Category	% of workers covered by										
	Total (A)	Health insurance		Accident insurance		Maternity benefits		Paternity Benefits		Day Care facilities	
		Number (B)	% (B / A)	Number (C)	% (C / A)	Number (D)	% (D / A)	Number (E)	% (E / A)	Number (F)	% (F / A)
Permanent workers											
Male	901	901	100	901	100	0	0	0	0	0	0
Female	5	5	100	5	100	5	100	0	0	0	0
Total	**906**	**906**	**100**	**906**	**100**	**5**	**0.6**	**0**	**0**	**0**	**0**
Other than Permanent workers											
Male	1353	1036	77	1097	81	0	0	0	0	0	0
Female	4	4	100	4	100	4	100	0	0	0	0
Total	**1357**	**1040**	**77**	**1101**	**81**	**4**	**0.3**	**0**	**0**	**0**	**0**

Table. Coverage of benefits for employees and workers

In its bid to provide employment and achieve diversity, Gil has employed seven differently abled personnel who perform without facing discrimination

S. No	Particulars	Total (A)	Male		Female	
			No. (B)	% (B / A)	No. (C)	% (C / A)
DIFFERENTLY ABLED EMPLOYEES						
1.	Permanent (D)	**2**	**2**	**100%**	**0**	**0%**
2.	Other than Permanent (E)	**0**	**0**	**0%**	**0**	**0%**
3.	**Total differently abled employees (D + E)**	**2**	**2**	**100%**	**0**	**0%**
DIFFERENTLY ABLED WORKERS						
4.	Permanent (F)	**4**	**4**	**100%**	**0**	**0%**
5.	Other than permanent (G)	**1**	**1**	**100%**	**0**	**0%**
6.	**Total differently abled workers (F + G)**	**5**	**5**	**100%**	**0**	**0%**

Table. Differently abled employees

18. Performance Appraisal, Incentives and Rewards

We ensure that our employees and workers are provided with timely appraisal and performance feedback.

Objectives of our Performance Appraisal System

- Link business objectives to the annual operating plans of various business units and in turn to individual targets
- Driving transparency & clarity on roles, performance expectations and performance outcomes and ensure that targets are aligned to the role
- Objectively measuring performance against defined targets
- Understanding & mentoring employee aspirations
- Enable a culture conducive to coaching and counselling through regular communication & feedback
- Encourage matured cultured behaviour through behaviour assessment
- Identifying training needs of the individual.

The table below shows the details of performance and career development reviews provided this year and the previous reporting year.

Category	FY 2023-24			FY 2022-23		
	Total(A)	No (B)	%B/A	Total(C)	No (D)	%D/C
Employees						
Male	775	775	100	779	779	100
Female	22	22	100	19	19	100
Total	**797**	**797**	**100**	**798**	**798**	**100**
Workers						
Male	901	579	64	919	515	56
Female	5	5	100	3	3	100
Total	**906**	**584**	**64**	**922**	**518**	**56**

Table. Appraisal in 2023-24 and 2022-23

19. Attrition

The table below shows the turnover rates of employees in the current year and the previous two years.

	FY 2023-24 (%)			FY 2022-23 (%)			FY 2021-22 (%)		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Permanent Employees	10.6	0.7	11.3	6.18	0.43	6.61	12.60	0.43	13.03
Permanent Workers	4.14	0	4.14	10.53	9	19.53	11.14	0	11.14

Attrition rate is one of the most appropriate indicatorsto represent effectiveness / or otherwise, of HR system in place. However, with majority of our people employed in our oldest factory Durgapur, there are several people superannuating every year. The above table includes the superannuation cases too. Without superannuation, the attrition percentage would have been much less

However, even with the impact of superannuation, we have been able to reduce the attrition rate reasonably well as portrayed in the figures below

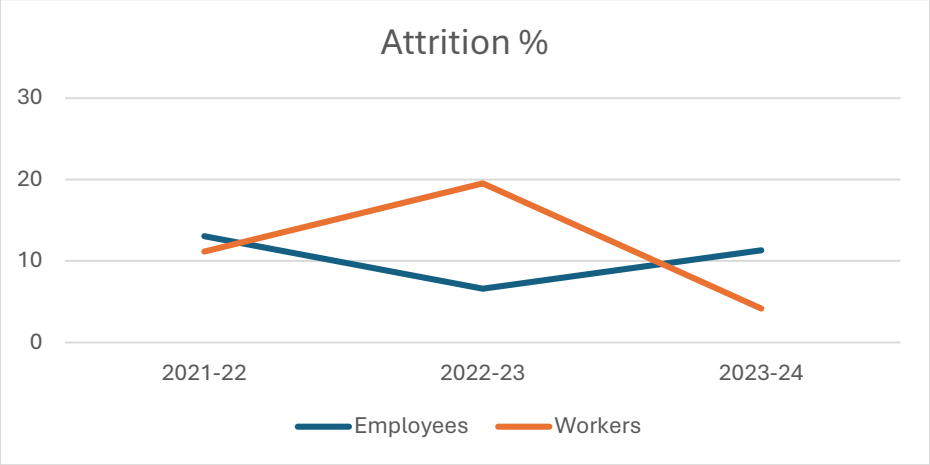


Fig. Attrition % over 3 years

20. Supply Chain

GIL's policy is to enable our value chain partners to perform well on sustainability, while following a robust due-diligence process during supplier onboarding. Our procurement policy is based on following 3 parameters:

- Best value for money, price, quality, availability & functionality
- Impacts on the environment that the product and/or service has over its life-cycle
- Working conditions, human rights, health considerations, and preference for SMEs, and local vendors, etc

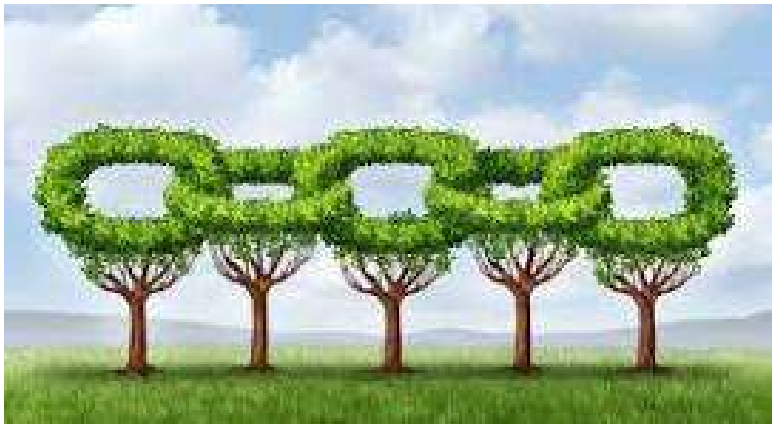
Our Supplier Code of Conduct incorporates sustainability. We address topics including:

- Ethics – business integrity; fair competition; privacy & intellectual property; identification of concerns; animal welfare and conflict minerals
- People issues – child labour avoidance; freely chosen employment; diversity & inclusion; fair treatment; working hours, wages & benefits; freedom of association
- Health & safety issues – quality requirements; health, safety, environment & quality regulations; product safety; occupational health & safety; process safety; emergency preparedness, risk information & training;
- Environmental issues – GHG management, water conservation, waste management

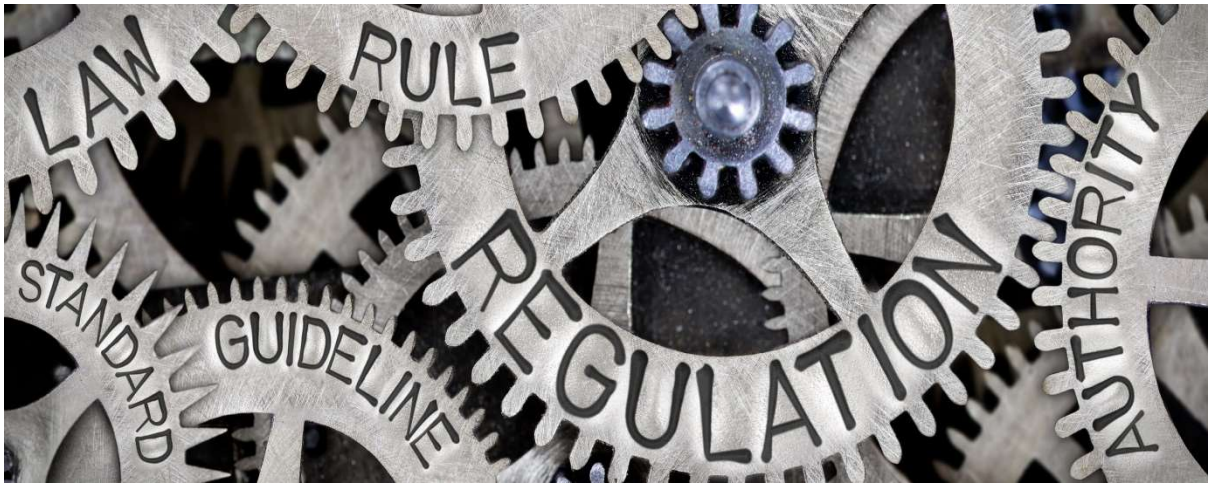
We have conducted trainings and awareness building programs with at least 90% of our suppliers by value of supplies. This enabled them to improve the sustainability of their own operations, thus improving our supply chain sustainability performance.

The supplier training programme is done with a focus on NGRBC principles and self-assessment audit on ESG Parameters. This led to awareness building on human rights among our suppliers.

One of our targets being reduction of scope 3 GHG emissions, we are trying to work extensively with our suppliers to find out opportunities in reducing their GHG emissions.



III. Governance



GIL believes in good governance as the base rock of our growth. We follow the best practices in both ESG and general management of our firm. We always look forward to strengthening our policies and procedures for better governance outcomes.

In the year 2023-24, GIL has adopted robust policies on **a)** Human Rights and **b)** Business Ethics. The Human Rights Policy articulates Company's firm stand on negating any harassment and discriminatory move against its employees and value chain partners and reaffirms its workplace free of any unfair and prejudiced practices. The policy on Business Ethics underpins GIL's long standing commitment of following highest corporate ethics, including total compliance with applicable Legal provisions.

This section focuses on our governance mechanisms in the following aspects:

- Board Structure and Composition
- ESG Governance and Board Oversight
- Ethics and Compliance
- Shareholder Relations
- Disclosure Practices

21. Board Structure and Composition

Our current Board of Directors consists of eight Directors – including five independent Directors. The Independent directors are initially appointed for a five-year term by the Board of Directors. Thereafter, if performance of the said directors is good, then the said directors are appointed for a second consecutive term of 5 years. The appointment of the Independent Directors are subject to the approval of the shareholders of the company. The appointment of non-independent directors is subject to retirement by rotation as per the provisions of Companies Act 2013. Their appointments are also placed before the members of the Company for their approval (are as per the approval of the shareholders in the Annual General Meeting). The directors are selected to serve based on their independence, integrity, diversity and experience. Other selection criteria include sound judgment in areas relevant to our businesses and willingness to commit sufficient time to the Board.

We have seven Board Committees – to assist the Board in discharging its duties. These include:

1) Audit Committee
2) Nomination and Remuneration Committee
3) Stakeholders Relationship Committee
4) Corporate Social Responsibility (CSR) Committee
5) Risk Management Committee.
6) Committee for Borrowings
7) Investment Committee

Details of each committee are available here.

22. ESG Governance and Board Oversight

Our governance framework adheres to best practices by incorporating Environmental, Social, and Governance (ESG) considerations into our business decisions. This approach ensures that ESG performance monitoring and decision-making are integrated at various organizational levels. The directors provide strategic guidance for our sustainability initiatives.

Further embedding ESG aspects and risk management, a corporate Risk Management program has been established within the company. This program is designed to empower employees and business associates to report any identified risks, escalating these concerns through the organizational hierarchy. The risk management system allows for the assessment, prioritization, and escalation of risks to the highest governing body. Strategies for managing significant risks, including those related to climate and other environmental issues, are routinely presented to the leadership. The Board reviews and approves ESG priorities, action plans, and risk mitigation strategies. The company's business plan includes guidelines that promote a sustainable business model and foundational strategies for long-term value creation.

The GIL Board had decided, after the pandemic crisis in 2020, to focus on resilience and business continuity. Risk identification and management are important aspects of this new approach.

We are committed to follow good Corporate Governance practices, which include having professional Directors on the Board, adopting pragmatic policies, effective systems and procedures and subjecting business processes to audits and checks, compliant with the required standards.

23. Ethics and Compliance

We believe in ethical business conduct. At GIL, we recognize that ethical conduct and compliance are not merely regulatory obligations, but foundational pillars of our corporate ethos. As a testament to our dedication to maintaining the highest standards of integrity and transparency, we have implemented robust policies and procedures that govern all aspects of our business operations. Our commitment extends beyond adherence to legal requirements, aiming to foster a culture of honesty and ethical behaviour that influences every decision we make.

GIL and its leadership are totally compliant with corporate regulations—bothinternal and external—andthis is an affirmation of the company's policy of strictly complying with all the legal requirements.

23.1. Code of Conduct

The key constituents of ethical business principles are enshrined in the Code of Conduct.

The Code of Conduct applies to GILs Directors and Management Personnel. It defines how we win with integrity, and it is our roadmap for making good decisions that will serve us well over the long term. The code defines the values and principles upon which we operate our business, compete in the marketplace and serve our customers around the world. The Code of Conduct is availablehere.

23.2. Business Ethics policy

GIL has approved and adopted a robust Business ethics policy in 2023-24. The policy details out:

- The need to comply with all the applicable legal provision without fail
- The necessity to adhere to provisions of Code of Conduct without fail
- Anti bribery provisions
- Red flags on acts which generate Conflict of Interest
- Embed moral values like Trust, Reliability, Responsibility etc which need to be followed in corporate working

Note: GIL has not had any fine imposed from SEBI authorities and no member of the Board and/or KMP has faced charges/implicated on violation of any provisions of companies act/ any malpractices involving any nine principles promulgated by NGRBC.

23.3. Whistleblower Mechanism

We have a Vigil Mechanism and Whistle Blower policy which enables directors and employees to report concerns with reliable evidence about unethical behaviour, actual or suspected fraud or violation of policies to the Chairman of Audit Committee / Company Secretary. Their postal address and email addresses are included in the said policy which is availablehere.

All complaints lodged under the purview of this policy and the action taken thereon, would be reported to the Board of Directors.

23.4. Human Rights

GILis committed to conducting its business in an ethical and responsible manner, including by carrying out our business activities in a way that respects and supports the protection of human rights through:

a) elimination of discrimination in employment;

b) prohibition child and forced labour; and

c) eradication of harassment and physical or mental abuse in the workplace.

GIL values the dignity of every employee, regardless of gender or rank, and we anticipate that all employees will behave responsibly at every level. Ensuring a safe and welcoming work environment is a fundamental component of the company's employment policy.

GIL has approved in 2023-24 a comprehensive Human rights Policy where it is stated unequivocally

"Graphite India Limited (GIL) is committed to maintaining a corporate culture that respects the principles aimed at promoting, protecting and supporting all nationally and internationally recognized human rights. The Company believes that contributing to the realization of Human Rights with its various facets, not only supports the sustainable operations of its business but is also critical to the ability of the company to influence Company's Stakeholders to adhere to such impactful values in their own operations."

The said Human rights Policy enunciates commitment to

- Dignity of all the stakeholders
- Wellbeing of employees, especially women
- Culture of respect & support for Human Rights
- Avoiding connivance in Human Right abuses: Abuses are Child labour, Forced labour and Sexual Harassment
- Adherence to principles of ILO and that of UNGC
- Freedom of association and right to collective bargaining
- Protection from discrimination: Indicative areas discriminations are Gender, differently abled Employee, Sexuality, Religion, Ethnicity, Age, Region, Personal beliefs, Political beliefs etc

In addition, related policies: 1) Equal Employee Opportunity Policy and 2) Diversity, Equity and Inclusion policy have also been adopted.

The company has also taken up goals on diversity and on outreach/ assessment of practices by supply chain members.

Moreover, in addition to the existing whistleblower policy, GIL has framed a Grievance Redressal Mechanism for its employees and workers, giving them an easily accessible and just platform to articulate and resolve their grievances with a proviso that malafide grievances designed to defame any employee/worker will attract disciplinary action from the management.

24. Shareholder Relations

Stakeholders Relationship Committee is in place to look after the shareholders relations & interests. The main purpose of this committee is to oversee the redressal of investors' complaints, including:

- Transfers/ transmission of shares
- Issue of duplicate share certificates
- Non-receipt of dividend / interest, dematerialization (Demat) of shares and
- All other related matters concerning investors

To support the "Green Initiative" undertaken by the Ministry of Corporate Affairs (MCA), to contribute towards a greener environment, we ensure delivery of notices, documents, annual reports etc. to the shareholders via electronic mode (to those Members whose email addresses are registered with the Company/ Registrars /Depositories).

Please visit https://graphiteindia.com/investors/for all the documents including quarterly & annual accounts, corporate presentations, shareholding patterns, annual general meetings, notices of board meetings, postal ballots, annual returns, investor education & protection fund, important events and the policies, policy on Dividend Distribution, Whistle Blower policy, etc.).

Notice and Annual Reports of GIL are also available on websites of the BSE Limited at www.bseindia.com and National Stock Exchange of India Limited at www.nseindia.com.

There were 25 complaints received by the Company from shareholders of the company, all of which (100%) were promptly attended to and redressed suitably to the satisfaction of shareholders and replied.

25. Disclosure Practices

We take care of all the disclosure requirements as mandated by SEBI and other regulators, including financial position/ performance of the company, shareholding pattern, corporate governance, as well as event-based disclosures including material developments in the business, changes in shareholding pattern, etc. by way of announcements on the stock exchange(s) and depend on the company's judgment with respect to materiality.

The additional disclosures as required by SEBI for a listed company, are made through the annual report of the Company.

Please visit https://graphiteindia.com/investors/and click on *Corporate Governance* to view the following policies at GIL:

- Code of Conduct
- Vigil Mechanism
- Policy on related Party Transactions
- Material Subsidiary Policy
- Code of Practices and Procedures for Unpublished Price sensitive Information
- Policy of Determination of Materiality of events
- Dividend Distribution Policy
- Archival Policy
- Articles of Association

ASSURANCE STATEMENT

To
The Management and Board of Directors,
Graphite India Limited
31 Chowringhee Road, Kolkata 700016

Futurestation Services LLP (also referred as "Futurestation" or "we" or "us") was engaged by Graphite India Limited (also referred as "GIL") to conduct a limited assurance procedure on the ESG Report FY 2023-24. This Assurance Statement applies to the procedure conducted by us as per the engagement agreement signed between GIL and Futurestation. The preparation of the ESG Report is the sole responsibility of GIL. Futurestation's responsibility was to conduct limited assurance procedure based on applicable standards as per the engagement agreement referred above.

Reporting Period

1st of April 2023 to 31st of March 2024.

Level of Assurance

Limited Assurance. We conducted our limited assurance procedure in accordance with International Standard on Assurance Engagements 3000 (Revised), Assurance Engagements other than Audits or Reviews of Historical Financial Information, issued by the International Auditing and Assurance Standards Board.

Disclosures Assured

As per engagement agreement, the data connected to the following disclosures were verified as a part of the assurance procedure.

Data / Statement - KPIs	**ESG Report Chapter Reference**
Energy related data	2.1 and 2.2
Water related data	6.1 and 6.3
Waste related data	8
Safety related data	14
Training related data	15
People, Diversity and Inclusion related data	17
Supply Chain related statement	20

The GHG Scope 1, 2 and 3 data have been verified by TUV India.

Procedure Performed

The procedures we performed were based onour professionaljudgement andincluded inquiries, observation of processes performed, inspection of data recording procedures on sample basis, inspection of data collating and recording procedures, evaluating the appropriateness of quantification methods and reporting policies and agreeing or reconciling with underlying records. Although we considered the effectiveness of management's internal controls when determining the nature and extent of our procedures, our assurance engagement was not designed to provide assurance on internal controls. Our procedures did not include testing controls or performing procedures relating to checking aggregation or calculation of data within IT systems. Given the circumstances of the engagement, in performing the procedures listed above, we:

- Made GIL's management and process owners aware of the procedures to be performed by us.
- Understood and evaluated the design of the key systems, processes and controls for managing, recording and reporting on the identified attributes.
- Checked consolidation for various sites and corporate office for ensuring the completeness of data being reported
- Based on that understanding and the risks that the reported data may be materially misstated, determined the nature, timing and extent of further procedures
- Performed substantive testing on aselective basis of the identified attributes to check that data had been appropriately measured, recorded, collated and reported;

- Reviewed records and performed testing including recalculation of sample data to establish an assurance trail
- Reviewed the level of risk involved in material incorrectness in recording, collating and reporting of the data

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our limited assurance conclusion

Our Responsibility

Our responsibility is to express a conclusion on the above mentioned KPIs based on the evidence we have obtained. We conducted our limited assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 Assurance Engagements Other than Audits or Reviews of Historical Financial Information. This standard requires that we plan and perform this engagement to obtain limited assurance about whether the KPIs in the Reports are free form material misstatement, whether due to fraud or error.

Observations

Our observations after conducting the reasonable assurance procedure are:

1. The data recording, collation and reporting process is fair. However, there is scope to improve its robustness, particularly with respect to water and waste, to reduce risk of misstatement.
2. The waste segregation, measurement and storage facilities have scope of improvement

Our Conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the selected KPIs and the Report have not been prepared, in all material respects, in accordance with the Applicable Criteria

Statement of independence, impartiality and competence

Futurestation Services LLP is an independent professional services firm that specializes in sustainability advisory and assurance services. No member of the assurance procedure performing team has a business relationship with GIL, its directors or managers beyond that required of this assignment. We conducted this procedure independently and to our knowledge there has been no conflict of interest. The team has extensive experience in conducting assurance over environmental, social, ethical, governance, health and safety information, systems and processes.

This assurance statement, including the opinion expressed herein, is provided to Graphite India Limited and is solely for the benefit of Graphite India Limited in accordance with the terms of our agreement. We consent to the release of this statement by Graphite India Limited in relation to ESG Report FY 2023-2024 but without accepting or assuming any responsibility or liability on our part to any other party who may have access to this statement.

Sudipta Das
Partner

FUTURESTATION SERVICES LLP
19th August 2024

Graphite India Limited

31 Chowringhee Road, Kolkata 700016, India