SUSTAINABILITY REPORT
2022

GRAFTech
International

ABOUT THIS REPORT

We are pleased to present the 2022 GrafTech Sustainability Report (the "Report"). This Report features environmental, social, and governance ("ESG") efforts and initiatives related to GrafTech International Ltd. and its subsidiaries (collectively, "GrafTech," the "Company," "our," or "we").

The disclosures in this Report provide historical company information and data covering 2022, unless otherwise noted. In some cases, data and information related to corporate responsibility and sustainability priority areas may include programs and activities underway or introduced in 2023.

The Report has gone through an internal review process, including executive and subject matter expert reviews. We welcome feedback and questions about this Report. Please direct all questions and feedback on this Report to sustainability@GrafTech.com.

MESSAGE FROM THE CEO

Dear Valued Stakeholders,

Since joining GrafTech in July 2022, I have witnessed the remarkable efforts across our organization that demonstrate our commitment to sustainability. I am excited to share the results of those efforts, as well as our ESG performance, accomplishments, and contributions towards the decarbonization of steel in the pages that follow.

GrafTech is proud to be a leader in the manufacturing of high-quality graphite electrodes, operating three of the most efficient and highest capacity graphite electrode manufacturing facilities in the world. The recent full re-start of our facility in St. Marys, Pennsylvania, further enhances our capabilities to support our customers decarbonization efforts. Our products are essential to the production of electric arc furnace ("EAF") steel, which is the fastest-growing segment of the global steel market and, importantly, more environmentally friendly than blast furnace steelmaking. In fact, EAF steelmaking generates significantly less carbon dioxide emissions compared to a blast furnace facility. It also directly supports the circular economy, as EAF steelmaking recycles scrap-based raw materials into new steel that is infinitely recyclable. Combined with our strides towards heat recovery and our ongoing transition to green electricity at our facilities, we are making significant progress—directly and indirectly— towards the decarbonization of steel.

GrafTech's success is only possible through the hard work of our global team and their commitment to upholding our core values of Safety, Environment, and Quality ("SEQ"). Our people have demonstrated this commitment, as well as determination and resilience, as we navigated through what proved to be a challenging year in 2022. In addition to the impacts of geopolitical conflict, high levels of inflation, and ongoing supply chain and economic uncertainty, the unanticipated suspension of our operations in Monterrey, Mexico, in late 2022 significantly affected our business.

Despite these challenges, we made important ESG progress in 2022. We made key investments in our heat recovery program, spending more than $13 million in 2022 and 2023. We expanded our safety initiatives, undertook several new community engagement programs, and embarked on new collaborations with universities to expand our research and development ("R&D") capabilities.

We are proud of our progress and of our ongoing contributions towards the sustainability of steel. We continue to identify and pursue opportunities to drive sustainability performance and increase transparency on ESG issues. In May 2023, GrafTech joined the United Nations Global Compact, a voluntary leadership platform for the development, implementation, and disclosure of responsible business practices. Looking forward, we remain fully committed to advancing our sustainability efforts across our global organization. Ultimately, we believe that this work supports our industry-leading position and competitive advantage, optimally positioning GrafTech for long-term growth and benefits for all stakeholders.

As always, I welcome your questions and comments on our sustainability efforts and look forward to engaging with you on these topics.

Sincerely,
Marcel Kessler
Chief Executive Officer

ABOUT GRAFTECH

GrafTech is a leading manufacturer of high-quality graphite electrode products essential to the production of EAF steel and other ferrous and non-ferrous metals. We have a competitive portfolio of low-cost, ultra high power graphite electrode manufacturing facilities, including some of the highest capacity facilities in the world. We are the only large-scale graphite electrode producer that is substantially vertically integrated into petroleum needle coke, our key raw material for graphite electrode manufacturing.

Founded in 1886, we have over 135 years of experience in the research and development of graphite- and carbon-based solutions, and our intellectual property portfolio is extensive. Headquartered in Brooklyn Heights, Ohio, GrafTech has more than 1,300 employees globally,[1] serving customers in over 50 countries. Our common stock is listed on the New York Stock Exchange ("NYSE") under the symbol EAF.

Graphite electrodes are an industrial consumable product used primarily in EAF steel production, one of the two primary methods of steel production and the steelmaking technology used by all "mini mills." Electrodes act as conductors of electricity in the furnace, generating sufficient heat to melt scrap metal, iron ore, or other raw materials used to produce steel or other metals. We estimate that, on average, the cost of graphite electrodes represents less than 5% of the total production cost of steel in a typical EAF, but they are essential to EAF steel production. EAF steelmaking has a significant advantage in terms of its environmental footprint, compared to steel produced through the basic oxygen furnace ("BOF") steelmaking model. According to the Steel Manufacturers Association ("SMA"), EAF steelmaking produces 75% fewer carbon dioxide emissions compared to BOF steelmaking.[2]

Petroleum needle coke is the key raw material we use in the production of graphite electrodes. We are substantially vertically integrated into this critical raw material source, significantly reducing our reliance on other suppliers. We believe we are one of the largest petroleum needle coke producers in the world. We also believe that the quality of our petroleum needle coke, controlled to exacting specifications, is superior for graphite electrode production compared to most of the petroleum needle coke available to our peers on the open market. This allows GrafTech to produce high-quality electrodes in a cost-effective manner.

For more information on our business and products, please visit our **corporate website**.

1   Number of employees as of December 31, 2022.
2   Source: Steel Manufacturers Association.

GRAFTECH AT A GLANCE

Founded
1886

Headquarters
Brooklyn Heights, Ohio

Sales volume
149
thousand metric tons[4]

More than
1,300
employees[3]

Net sales
$1.281
billion[4]

3 Number of employees as of December 31, 2022.

4 For the year ended December 31, 2022.

Our Operations

North America

Brooklyn Heights, Ohio, U.S.
Corporate Headquarters

Monterrey, Mexico
Graphite Electrode Manufacturing Facility, Sales & Service Subsidiary

Port Lavaca, Texas, U.S.
Seadrift Petroleum Needle Coke Manufacturing Facility

St. Marys, Pennsylvania, U.S.
Graphite Electrode Manufacturing Facility, Sales & Service Subsidiary

South America

Salvador, Brazil
Machine Shop, Sales & Service Subsidiary

Africa

Alberton, South Africa
Sales & Service Subsidiary

Europe

Bussigny, Switzerland
Global Sales and Production Planning Office

Calais, France
Pamplona, Spain
Graphite Electrode Manufacturing Facility, Sales & Service Subsidiary

Milano, Italy
Ratingen, Germany
Sheffield, United Kingdom
Sales & Service Subsidiary

Asia Pacific

Hong Kong, China
Seongnam, South Korea
Service Subsidiary

Chiba-Shi, Japan
Sales & Service Subsidiary

Middle East

Dubai, United Arab Emirates
Sales & Service Subsidiary

SUSTAINABILITY AT GRAFTECH

Sustainability is fundamental to GrafTech's business strategy and culture. Ultimate responsibility for sustainability is held by our ESG Steering Committee, which includes our Vice President of Investor Relations and Corporate Communications; Director of Health, Safety, and Environmental Protection ("HS&EP"); and our senior leadership team, which is composed of the Chief Executive Officer ("CEO"), Chief Financial Officer ("CFO"), Chief Operating Officer ("COO"), Chief Legal Officer ("CLO"), Vice President Human Resources ("HR"), and Senior Vice President, Commercial and Customer Technical Service ("CTS"). The Committee is responsible for defining our ESG mission and developing, implementing, and overseeing the company-wide ESG strategy.

Our ESG working group is composed of cross-functional subject matter experts and includes representatives from environmental, health and safety; engineering; research and development ("R&D"); legal; finance; investor relations; communications; procurement; HR; and commercial. The working group is responsible for developing and implementing programs and initiatives that support our ESG strategy, including:

- Supporting ESG programs at our individual sites;
- Establishing, tracking, and reporting on key performance indicators ("KPIs") relevant to our priority topics;
- Providing ESG-related disclosures to stakeholder groups, including publication of the annual sustainability report; and
- Identifying and prioritizing opportunities, emerging technologies, and strategies to improve our ESG performance.

As part of our continuous improvement efforts, the capital planning process includes a review of ESG impacts to ensure they are considered in the project approval process. A summary of our ESG initiatives and metrics is shared monthly in our business review meetings.

In May 2023, GrafTech joined the United Nations Global Compact ("UNGC"), a voluntary leadership platform for the development, implementation, and disclosure of responsible business practices. The UNGC challenges companies to conduct business responsibly by aligning their strategies and operations with universal principles on human rights, labor, environment, and anti-corruption, and to take actions that advance societal goals. GrafTech is proud to join the UNGC, and we look forward to building upon our environmental, social, and governance strategies for the benefit of the environment and our stakeholders as we help shape a sustainable future.

Enabling the Sustainability of Steel

GrafTech plays a vital role in the global transition to a more sustainable future of steel manufacturing. The production of steel remains an energy-intensive activity with total direct emissions from the steel sector representing between 7% and 9% of global anthropogenic carbon dioxide ("CO_2") emissions.[5] However, EAF steel production, one of the two main processes for making steel, is more energy efficient and has a smaller environmental footprint compared to the traditional BOF steelmaking process. According to the SMA, EAF steelmaking produces 75% fewer carbon dioxide emissions compared to BOF steelmaking.

Graphite electrodes are essential for EAF steelmaking, as they are currently the only known commercially available products that have the electrical conductivity and ability to sustain the high levels of heat generated in EAF steel production. As a result, EAF steel manufacturers require a reliable supply of high-quality graphite electrodes. When our products are used in EAF steelmaking, we directly contribute to the decarbonization of the steel industry.

Further, GrafTech and our customers are contributors to the circular economy. GrafTech's electrodes are manufactured using primarily petroleum needle coke and coal tar pitch, which are derived from byproducts of the oil and coal refining processes, respectively. In addition, SMA notes that the EAF steelmaking process is a sustainable model for recycling scrap metal into new steel, which is completely and infinitely recyclable at the end of its useful life. As a leading producer of graphite electrodes, GrafTech provides our customers with materials that are mission critical to accomplishing EAF steelmaking, thereby enabling the sustainability of steel.

Please see our **Products** section for more details.

5   Source: World Steel Association.

Stakeholder Engagement

At GrafTech, we believe strong, mutual relationships with stakeholders are essential to our success. Stakeholder input contributes to informing our sustainability practices, policies, and priorities. We identify stakeholders through conversations with our senior leadership team, the ESG Steering Committee, the ESG working group, and subject matter experts within GrafTech, and community liaisons at all our locations. We select stakeholders for engagement based on their knowledge and understanding of our overall operations, industry positions, regulatory landscape, and community involvement.

We regularly engage our stakeholders both formally and informally to identify and proactively address emerging sustainability needs, risks, and opportunities. Stakeholder engagement centers on employee involvement in industry organizations and associations, as well as interactions with customers, suppliers, and community members. Our stakeholder groups include customers, investors, suppliers, employees, leadership and Board members, regulators, industry associations, trade associations, non-governmental organizations, and community members.

Materiality

In 2022, we continued to utilize results obtained from our 2021 materiality assessment. The materiality assessment identified the priority ESG topics that inform the content of this report as well as our overarching ESG strategy. We use the Global Reporting Initiative ("GRI") definition of materiality, which states that a material topic reflects a reporting organization's significant economic, environmental, and social impacts, or substantively influences the assessments and decisions of stakeholders.[6] Once identified, these topics were mapped and prioritized in terms of importance to our business and stakeholders. The complete assessment process included the actions listed below.

2022 Materiality Assessment Update Process

Identifying Topics

- Evaluated 23 potential ESG topics
- Obtained topic input from key internal and external stakeholders
- Analyzed industry, market, and regulatory data
- Conducted thorough review of emerging trends
- Performed benchmarking and research against:
  - Four peers
  - Four customers
  - Four rater and rankers
  - Seven industry associations and thought leaders

Engaging Stakeholders

- Engaged with GrafTech internal subject matter experts to refine the topics list and identify possible impacts, risks, and opportunities across GrafTech's value chain
- Interviewed stakeholders and validated results

Prioritizing Results

- Assigned each topic with a value based on importance to GrafTech's business and stakeholders to identify the highest priority ESG topics
- Results revealed priority topics in six focus areas

6   GrafTech did not use the concept of materiality as defined by the U.S. Securities and Exchange Commission ("SEC") within the context of this Report. Issues deemed material and use of the words "materiality" and "material," for purposes of this Report, may not be considered material for SEC reporting purposes.

Our Focus Areas

Our sustainability approach leverages six focus areas: Governance, Environment, Products, Customers, Community, and Workforce. In each focus area, we have identified priority ESG topics that reflect our commitment to these tenets, as well as the significant role they play in our sustainability efforts. Priority ESG topics in each focus area include those listed below.

Governance

- Regulatory Compliance

Environment

- Climate and Energy
- Air Emissions
- Water
- Waste

Products

- Materials Sourcing
- Product Quality
- Product Stewardship
- Innovation

Customers

- Customer Service

Community

- Community Engagement

Workforce

- Workforce Diversity
- Occupational Health and Safety
- Workforce Management
- Talent Attraction and Retention

BUSINESS ETHICS AND CORPORATE GOVERNANCE

Corporate Governance

GrafTech is a publicly traded company, listed on the NYSE, and complies with applicable NYSE listing and governance standards and SEC rules and regulations.

Our Board is committed to strong corporate governance practices and dedicated to ensuring that GrafTech is managed for the long-term benefit of our stockholders and other stakeholders. To fulfill this role, the Board and its committees meet throughout the year and engage in meaningful discussions with management to ensure that the Board is informed regarding the Company's activities, operating plans, and initiatives. These discussions, as well as the Corporate Governance Guidelines, aid the Board in maintaining strong oversight, acting as advisor to senior management, and defining and enforcing standards of accountability, all to enable senior management to execute responsibilities in the best interests of the Company and its stockholders.

Our Board currently consists of nine directors: seven are independent under NYSE definitions, one is a Brookfield representative, and one is GrafTech's CEO and President.

Two of our directors are women. The Board has three standing committees to assist it in carrying out key responsibilities: the Audit Committee, the Human Resources and Compensation Committee, and the Nominating and Corporate Governance Committee. Our Nominating and Corporate Governance Committee reviews at least annually the skills, qualifications, and characteristics for the election of new or continuation of existing directors. The criteria for selecting new directors must meet applicable legal and NYSE requirements. The Committee also considers a candidate's integrity, strength of character, judgment, business experience, specific areas of expertise, and principles of diversity, among other items. The Nominating and Corporate Governance Committee maintains a Board of Directors Diversity Policy, which illustrates its attention and desire to preserve an environment free from discrimination on the basis of, among other things, race, color, religion, nationality, age, and gender. Additionally, the Board and its committees evaluate their performance annually based on criteria developed by the Nominating and Corporate Governance Committee to determine whether the Board and its committees are functioning effectively.

GOVERNANCE

Our success is only possible with the hard work of our global team and their commitment to upholding our core values of SEQ. These values focus our attention on a core mission for GrafTech: providing a safe work environment for all employees, environmental stewardship, and delivering superior product quality.

As a company, we are committed to unyielding integrity and to ensuring the success of future generations of employees, customers, stockholders, and communities.
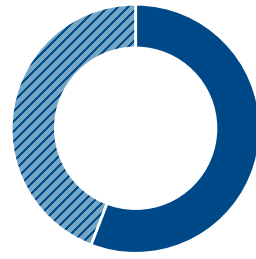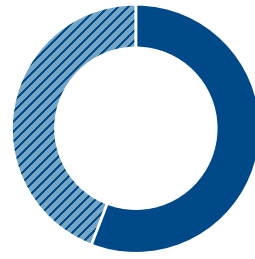
FOCUS ON SAFETY
PROTECT OUR ENVIRONMENT
SEQ
BUILD QUALITY

Board of Directors Snapshot[7]

Independence
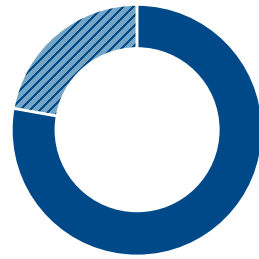
- **7** independent
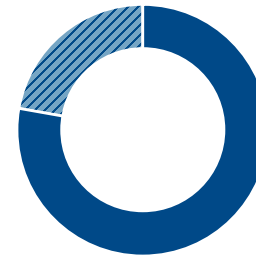- **2** non-independent

Age

- **5** less than or equal to 62 years of age
- **4** greater than or equal to 63 years of age

Tenure

- **5** less than or equal to 3 years of tenure
- **4** greater than or equal to 4 years of tenure

Diversity

- **7** male
- **2** female

7   As of May 10, 2023.

Committee Composition

- Board committees are composed entirely of independent directors

Director Key Skills

- Financial expertise
- CEO or executive management expertise
- Industry experience

For more information on our corporate governance practices, please see our most recent Proxy Statement.

ESG-Linked Compensation

In 2022, the CEO and President, CFO, and the Human Resources and Compensation Committee (the "HR & Compensation Committee"), in consultation with its compensation consultant, undertook a review of GrafTech's executive compensation program, particularly the Short-Term Incentive Plan ("STIP") and long-term incentive compensation portions of the program.

The review identified opportunities to better align annual cash incentive awards with corporate objectives, and, in 2023, the HR & Compensation Committee introduced modifications to the STIP that explicitly link incentive awards with ESG-linked, non-financial metrics. These metrics focus on safety, ESG and diversity training, and community involvement, and account for 20% of individual targets. For more information on this compensation update, please see our most recent Proxy Statement.

Risk Oversight

The Board oversees the management of GrafTech's risk exposure through the following framework: management regularly provides the Board with updated information concerning strategic, operational, and emerging risks to GrafTech's primary business goals and initiatives in each geographic area and each functional group, as well as the Company's efforts to mitigate those risks.

The Board is responsible for understanding GrafTech's most significant risks, ensuring that management responds appropriately, and making risk-informed strategic decisions. The Board monitors risk exposure to ensure it is in line with GrafTech's overall tolerance for and ability to manage risk.

Our Audit Committee, which is made up solely of independent directors who have had extensive experience in providing strategic and advisory services to other companies, assists the Board in evaluating the risks the Company faces as well as our policies for risk management and assessment.

The Audit Committee:

- Has primary responsibility for assisting the Board with risk oversight for GrafTech, as well as our policies for risk management and assessment.

- Considers audit, accounting, financial reporting, and compliance risk, including material litigation instituted against GrafTech, cybersecurity issues, and resolution of any ethics issues.

- Holds separate executive sessions at each regularly scheduled meeting; these sessions may include representatives from our independent registered public accounting firm, or our risk management, internal audit, finance, or legal departments.

The Human Resources and Compensation Committee:

- Reviews and balances risk in our executive compensation practices, programs, and policies.

- Annually assesses GrafTech's compensation programs to determine if any elements of these plans create an inappropriate level of risk and to evaluate management's methods to mitigate any potential risks.

The Nominating and Corporate Governance Committee:

- Oversees risks associated with Board and committee composition.

- Reviews and reports to the Board on a periodic basis with regards to matters of corporate responsibility, diversity, and sustainability, including trends and impacts to the Corporation's business of ESG issues.

- Manages the annual self-assessments of the Board and its committees and oversees the implementation and reporting back of the results.

The Board's role in risk oversight complements our leadership structure with senior management responsible for assessing, managing, and mitigating our risk exposure and the Board and its committees overseeing those efforts. We believe that this is an effective approach for addressing the risks we face as it allows our independent directors, including the fully independent Audit Committee, to evaluate our risks and our risk management and assessment policies with ultimate oversight by the full Board.

Business Ethics

At GrafTech, ethical conduct is a fundamental principle, synonymous with business success and essential for carrying out all business objectives. Our Code of Conduct and Ethics (the "Code") serves as the foundation for these values and guides our team in making thoughtful and well-informed decisions. The Code applies to employees, directors, and officers of GrafTech, and the Board reviews the Code annually as part of its regular review of our corporate governance practices.

The Code, which was updated in 2022, outlines our commitment to fostering a healthy, safe, and secure work environment for all our employees by providing equal employment opportunities and a harassment-free workplace, and by respecting human rights and diversity. Our Code also provides employees with guidance on conducting business ethically, including complying with laws for anti-trust and competition, anti-bribery, export control, and environmental regulations.

GrafTech provides employees with formal ethics and compliance training sessions on topics that include workplace harassment, avoiding bribery and corruption, prohibiting insider trading, complying with international trade laws and regulations, and reinforcing information technology ("IT") security. As part of this annual ethics training, our employees review and certify compliance with the Code. In 2022, 97% of salaried employees completed Code of Conduct, insider trading, and avoiding bribery and corruption training.

All of our employees, directors, officers, and business partners play an important role in maintaining our culture of ethics and integrity, and we encourage them to raise concerns or report violations. Employees have the ability to raise concerns or report a violation through several means, including reporting to supervisors or managers, the HR department, the legal department, or through the Ethics Line, which can be accessed by phone or through an online platform.

The Ethics Line is operated by an independent third party, is available 24/7, and provides the option to report complaints anonymously. It is our policy that no employee or representative shall be retaliated against for asking questions, raising concerns, or assisting in an investigation relating to an actual or potential violation of the Code or GrafTech policy or procedure, provided such individual is acting in good faith. We take all reports and concerns seriously, and members of the internal audit team, legal department, and HR department manage the investigation of reported ethics violations and determine appropriate follow-up corrective actions. The Internal Audit team reviews the number and types of ethics complaints received and outcomes of the investigations with the Audit Committee and the Board annually. In 2022, GrafTech reported zero confirmed corruption incidents.

In 2022, 97% of salaried employees completed Code of Conduct, insider trading, and avoiding bribery and corruption training.

We view our suppliers and contractors as an extension of GrafTech and hold them to the same high standards of ethical conduct, which is further outlined in our Code of Conduct for Suppliers and Contractors ("Supplier Code of Conduct"). We expect our suppliers and contractors to comply with all applicable laws, and GrafTech reserves the right to audit suppliers and contractors for compliance with the Supplier Code of Conduct.

DATA SECURITY AND PRIVACY

As data breaches continue to be a concern for many global companies, it is critical for GrafTech to maintain the security and integrity of our IT systems and the data we store related to our business, employees, suppliers, and customers. We are also monitoring the emerging landscape of data security and privacy regulations, and we are subject to and comply with various existing regulations such as the EU General Data Protection Regulation.

Our Audit Committee is responsible for reviewing the IT security program and reporting to the Board on results of security assessments and controls. GrafTech representatives from various departments, including IT, internal audit, legal, and HR, are responsible for developing, implementing, and monitoring IT security and data privacy programs. We maintain policies and procedures to address information security, data use and protection, and cybersecurity management.

Every employee plays a critical role in ensuring the protection of our information systems. In 2022, we updated our global privacy policy for all employees in compliance with regulatory requirements and implemented a global data privacy training program for all salaried employees through our online learning system. The training program was completed by 96% of applicable employees in its first year.

In addition to data privacy, employees participate in quarterly training focused on cybersecurity initiatives, and security awareness and data protection are also included in the annual Code of Conduct training.

To instill vigilance across our organization, our IT team also routinely deploys phishing campaigns to test user awareness. We engage third-party experts to evaluate and test our cybersecurity controls and information security programs to assess our ability to mitigate and prevent cybersecurity attacks.

ENVIRONMENT

At GrafTech, we understand that graphite electrode manufacturing processes have an impact on the communities in which we operate and their surrounding environment. Simultaneously, we recognize that our operations and the long-term success of our business depends on our ability to reduce our environmental footprint. For these reasons, we have identified energy conservation, increased use of low carbon and renewable energy sources, reduction of greenhouse gas and other air emissions, waste recycling, and water management as key strategies for reducing our environmental impact.

OVERVIEW

GrafTech maintains environmental management systems at each of our manufacturing sites that allow us to identify risks and opportunities related to our environmental priorities, measure our responses, and, ultimately, reduce our impact on the environment. Our management system is anchored by policies and procedures that allow us to operate in compliance with our regulatory obligations and protect our local environments and communities. To further evolve our environmental management system, GrafTech developed an overarching environmental policy in early 2023, which describes how our organization is committed to minimizing our impact on the environment and the activities we pursue to meet that commitment.

Environmental professionals at each site are responsible for overseeing regulatory compliance, tracking progress, and reporting performance on related metrics. Similar to our occupational health and safety program, we have established targets for select environmental KPIs and report progress toward our targets monthly to the senior leadership team and quarterly to our Board of Directors.
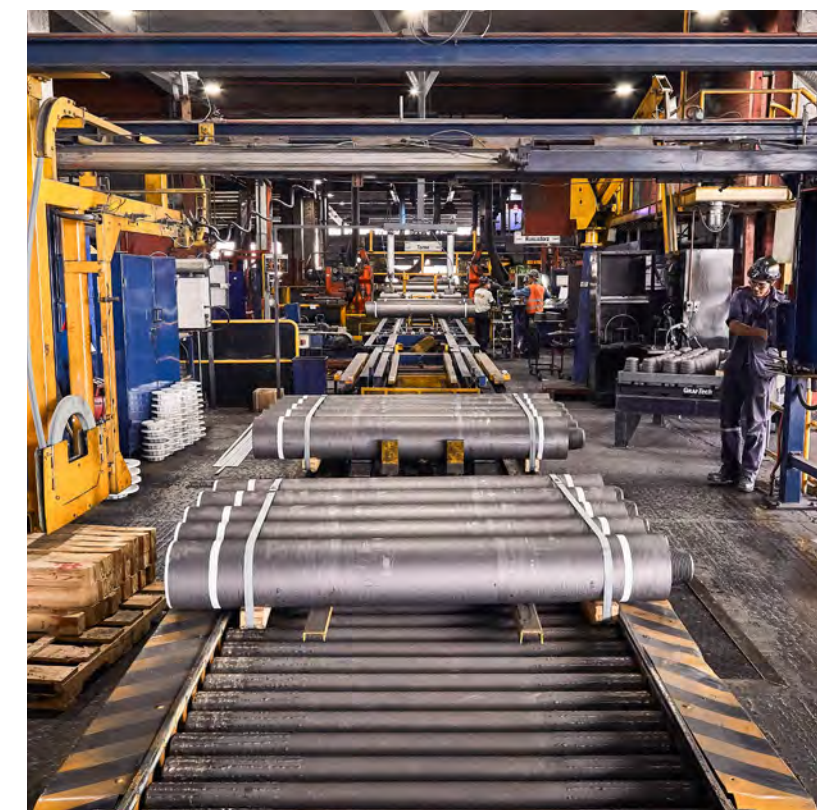
Each site is subject to periodic audits of their environmental management system. Our Corporate HS&EP group conducts these audits, which are supported by local third-party auditors who are familiar with environmental laws and regulations in the regions where the sites are located.

Additionally, we recognize the ISO 14001 standard as best practice for environmental management. Along with ISO 14001 certifications, our Calais, France, and Pamplona, Spain, sites also maintain the ISO 50001:2018 certification for energy management. Both sites have developed systems that identify main energy sources, track energy usage trends, measure results, find anomalies, and implement continuous improvement plans and corrective actions as needed. Together, the environmental and energy management programs provide the framework for our sites to achieve reductions in our climate impacts.

We are actively working with each of our facilities as we create a roadmap for achieving reductions in our environmental impact.

Our Operations in Monterrey, Mexico

On September 15, 2022, inspectors from the State Attorney's Office for the Environment of the State of Nuevo León, Mexico visited GrafTech Mexico, S.A. de C.V.'s ("GrafTech Mexico," a subsidiary of the Company) graphite electrode manufacturing facility located in Monterrey, Mexico to inspect GrafTech Mexico's facility and some of the facility's environmental and operating permits. At the conclusion of the inspection, the inspectors issued a Record of Inspection for providing the results of the inspection, their observations, and the imposition of a temporary suspension of GrafTech Mexico's facilities within seven days. The temporary suspension of operations was conditionally lifted on November 17, 2022, subject to the completion of certain agreed-upon activities, including the submission of an environmental impact study with respect to the facility's operations. Importantly, at no time during or after the inspection has it been alleged by the relevant authorities that our operations in Monterrey exceeded any existing emissions standards.

CLIMATE AND ENERGY

At GrafTech, we recognize climate and energy to be key issues for our stakeholders. As such, energy management is fully integrated into our operations–from our policies and procedures to data collection and monitoring of performance metrics. We continuously evaluate our internal climate and energy management programs, looking for opportunities to improve processes and better align with our stakeholders' expectations.

Due to the significance of climate and energy, we are taking additional steps to measure, manage, and identify opportunities to reduce the amount of energy consumed by and the amount of greenhouse gas ("GHG") emissions generated from our manufacturing process and throughout our value chain. We have subject matter experts at GrafTech who work with each site to identify projects that align with our overarching climate and energy strategy.

We recognize the need for additional transparency around climate and energy goals and related disclosures. We have had internal goals for reducing energy intensity and GHG emissions across our operations. These goals reflect our dedication to reducing Scope 1 emissions through process and technology improvements in the short term, as well as our ongoing investigation into alternative fuel sources and lower emission sources of electricity as a means for reducing Scope 2 emissions in the medium to longer term. Additionally, in 2023 we will begin engaging our suppliers to better understand Scope 3 emissions, and plan to provide more insight into the energy intensity of our supply chain in next year's report.

Heat Recovery Systems

In Pamplona, we continue to see success with the implementation of recovered heat and energy to reduce our direct consumption. Since the plant installed a heat recovery system in 2020, we have had annual reductions in natural gas consumption and emissions reductions at the facility. The heat recovery program began with a single furnace and expanded to six additional furnaces in 2022. Construction of the expanded heat recovery system will be completed and startup of this new unit will begin in 2023.

Over the course of 2023, we plan to further expand the heat recovery program at Pamplona to an additional six furnaces for a total of 13 furnaces that include a heat recovery system at the plant. In 2022 and 2023, we have spent more than $13 million on the heat recovery expansion project, which we anticipate will yield an approximate 24% reduction in natural gas from Pamplona's first bake operations alone.

We view the heat recovery program at Pamplona as a benchmark for reducing energy consumption and GHG emissions across our operations. We are closely monitoring performance at the site, and our engineering and operations teams are using the expansion as a study to identify opportunities for applying recovered heat programs at other plants. If the anticipated objectives are realized, our intention is to further expand the program throughout our graphite manufacturing sites. Calais has conducted a feasibility study that identified several opportunities for recovered heat application and has completed required incinerator upgrades resulting in more thorough incineration of air emissions.

Additional Opportunities to Reduce Energy Intensity

We continue to investigate opportunities to produce and increase our consumption of electricity generated using greener energy sources. Our Seadrift plant continues to use an on-site steam turbine that produces electricity from excess heat generated during the calcining process. The electricity generated by the turbine is used for Seadrift's manufacturing process, improving the overall energy efficiency of our operations there. Any surplus electricity is sold to the electrical grid and serves as an additional source of energy for the local community. In 2022, Seadrift sold more than 8.3 million kilowatt hours (30,000 gigajoules) back to the grid.

We are also diversifying our energy mix at our plants to incorporate more alternative and renewable sources. The Calais plant has successfully transitioned to electricity generated from 100% nuclear energy, which is considered wholly sustainable by EU standards.

Additionally, at several of our locations, we have implemented an "off-peak hours" strategy that focuses on conducting energy-intensive operations at times when the local electrical grid is experiencing less demand from the surrounding community. These strategies have resulted in incremental improvements in our energy expenditures and local community impact, and we believe they represent opportunities for more significant impacts for both GrafTech and the communities in which we operate. We plan to further investigate in these strategies in the coming years for our other locations.

Performance

In 2022, geopolitical conflict, supply chain pressures, high levels of inflation, and economic uncertainty impacted global markets. The steel industry was not exempt from these impacts, and this, in turn, resulted in decreased demand for graphite electrodes. In addition, the unanticipated suspension of our operations in Monterrey in late 2022 further affected our business. In 2022, our sales volume was 149,000 metric tons, which represented a decrease of 11% compared to 2021.

While a decrease in sales resulted in a decrease in direct energy consumption and Scope 1 and 2 emissions compared to 2021 levels, we do not anticipate these reductions to be sustained. Furthermore, looking ahead to 2023, as we bring full production capabilities online at St. Marys, decreasing–or even maintaining–energy consumption and related emissions will be a challenge, particularly as production expands. Projects and programs that support our commitment to reducing our overall energy and emissions intensity will be implemented.[8]

We continue to explore options for diversifying our energy mix, particularly as it relates to increasing the percentage of that mix made up of green electricity. We monitor our energy usage data monthly to identify site-specific opportunities for reducing energy consumption and emissions. Our expectation is that through routine evaluations we can identify process improvements at each site.

We began completing the Climate Disclosure Project ("CDP") survey in 2022 in response to requests from stakeholders. Last year's survey highlighted a need for Scope 3 data and climate impact assessments. We completed our first Life Cycle Assessment ("LCA") for graphite products manufactured at our Pamplona facility. The results of the assessment are being used to help our team further define opportunities and target areas for reducing our environmental impact.
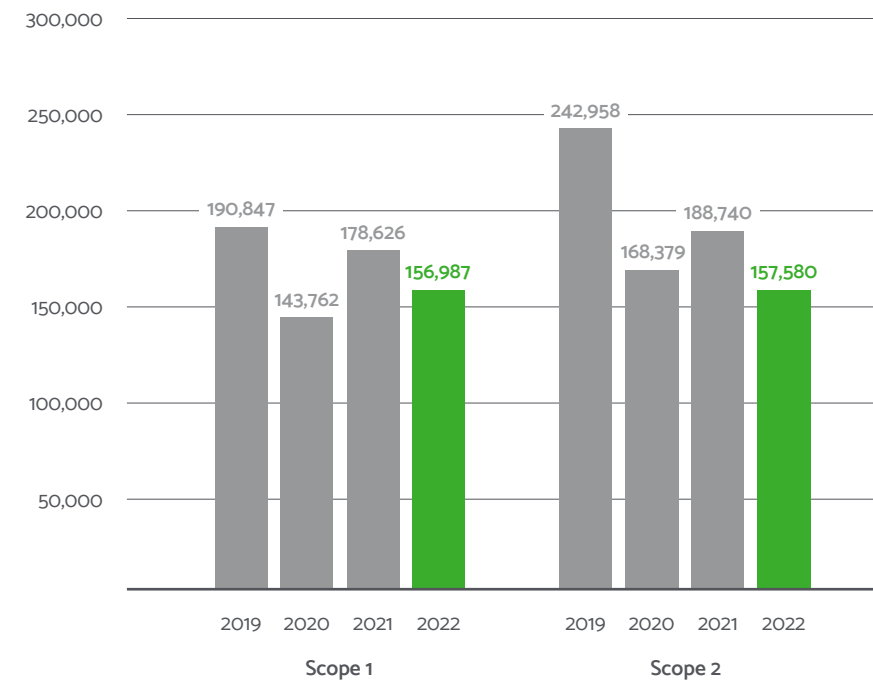
Total Energy Consumed[9] (gigajoules)
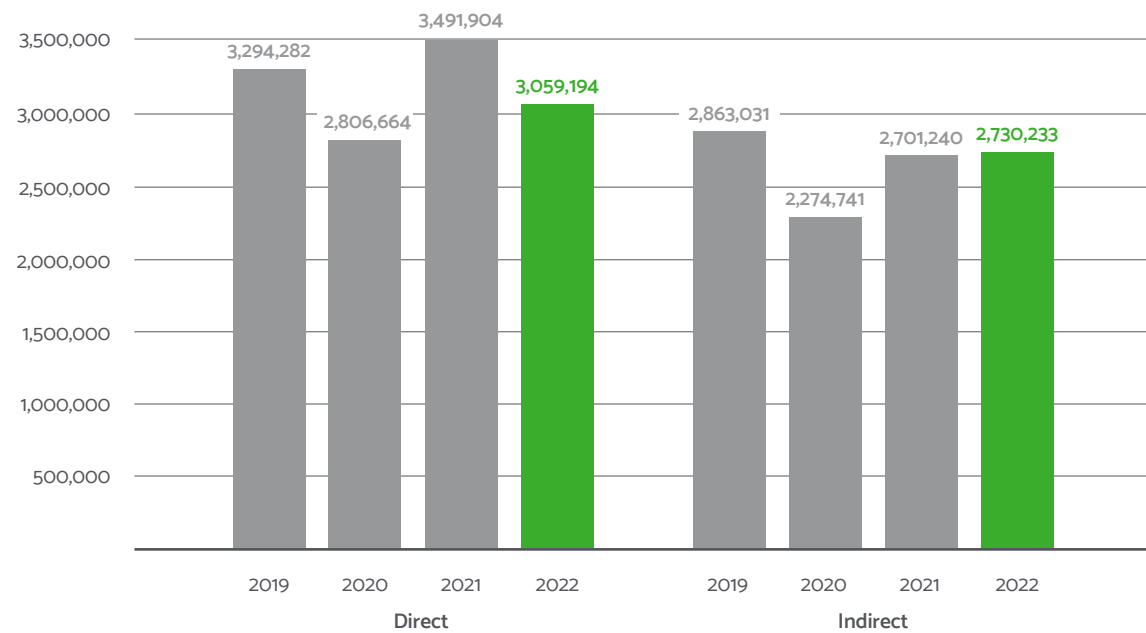
8   Intensity represents energy usage divided by the metric tons of graphite electrode production (production volume).

9   Energy usage includes data from our manufacturing facilities, headquarters campus, and Bussigny office.

Scope 1 and Scope 2 GHG Emissions[10] (MTCO$_2$e)

Scope 1 and Scope 2 GHG Emissions Intensity[11, 12]

(MTCO$_2$e/MT graphite)
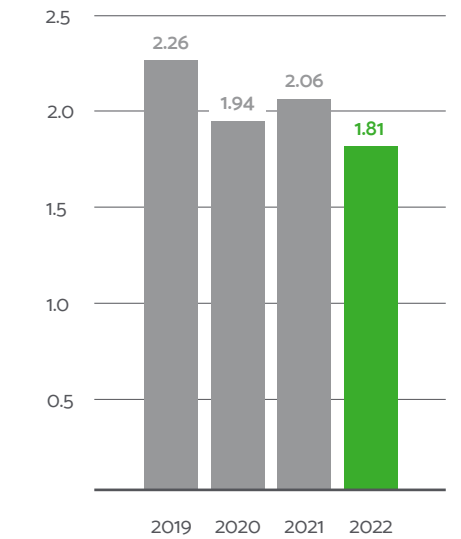
10   Scope 1 GHG emissions are direct emissions from on-site fuel combustion. Scope 1 emissions include our manufacturing facilities and our headquarters campus. The baking process has been identified as the primary driver for Scope 1 emissions. Scope 2 GHG emissions are indirect emissions resulting from the generation of electricity, heat, or steam purchased from a utility provider. Scope 2 emissions include our manufacturing facilities, headquarters campus and Bussigny office. The graphitizing process has been identified as the primary driver for Scope 2 emissions. Both Scope 1 and 2 emissions are calculated using the GHG Protocol methodology.

11   GHG emission intensity is set with an operational boundary of the four graphite electrode manufacturing plants (Calais, France; Pamplona, Spain; Monterrey, Mexico; and St. Marys, Pennsylvania).

12   Scope 1 and 2 GHG emission intensity is measured as metric tons of CO$_2$e divided by the metric tons of graphite electrodes produced (production volume) in the reporting year. Production volume for 2019–2022 are as follows: 2019 = 177,000 metric tons; 2020 = 134,000 metric tons; 2021 = 165,000 metric tons; 2022 = 157,000 metric tons.

AIR EMISSIONS

At GrafTech, we recognize the importance of clean air for our employees and the communities and environments in which we operate. We continue to prioritize and implement projects designed to reduce air emissions generated by our manufacturing processes, including nitrogen oxides ("NO_x"), sulfur oxides ("SO_x"), and particulate matter ("PM"), to improve local air quality.

Each site has implemented a management program to monitor, manage, control, and reduce the emissions generated by our manufacturing processes. These programs are monitored alongside our climate and energy initiatives and are subject to the same management structure as our other environmental programs.

Pamplona Dust Collector: Monitoring Our Progress

The installation of the dust collector at our graphitizing building at our Pamplona plant in 2021, has allowed GrafTech to collect particulate matter from the air emissions generated during the graphitizing process. Prior to the dust collector's installation, these emissions were fugitive and could not be accurately measured. Today, these same emissions are captured and recorded, ultimately reducing the amount of particulate matter emitted directly into the air. Since installation, the dust collector has captured approximately three metric tons of fugitive particulate matter emissions each month.

Performance

Due to the decrease in production volume in the last year, we recorded a decrease in air emissions. We remain committed to reducing our air emissions where possible and continue to monitor all process improvement projects that have the potential to impact air emissions. We look to ensure that any changes and upgrades to our facilities are achieving and maintaining anticipated outcomes and do not negatively impact air quality in our local communities.

Air Emissions[13] (metric tons)

Chart data:

NO_x
- 2019: 411
- 2020: 317
- 2021: 485
- 2022: 387

SO_x
- 2019: 1,076
- 2020: 855
- 2021: 935
- 2022: 804

Particulate Matter[14]
- 2019: 275
- 2020: 176
- 2021: 203
- 2022: 153

13   Air emissions includes data from only our manufacturing facilities.

14   Particulate Matter ("PM") is reported as total PM at most sites. Some sites only report PM with diameters that are generally 10 micrometers and smaller (PM_{10}). These values have been included in the total PM emissions.
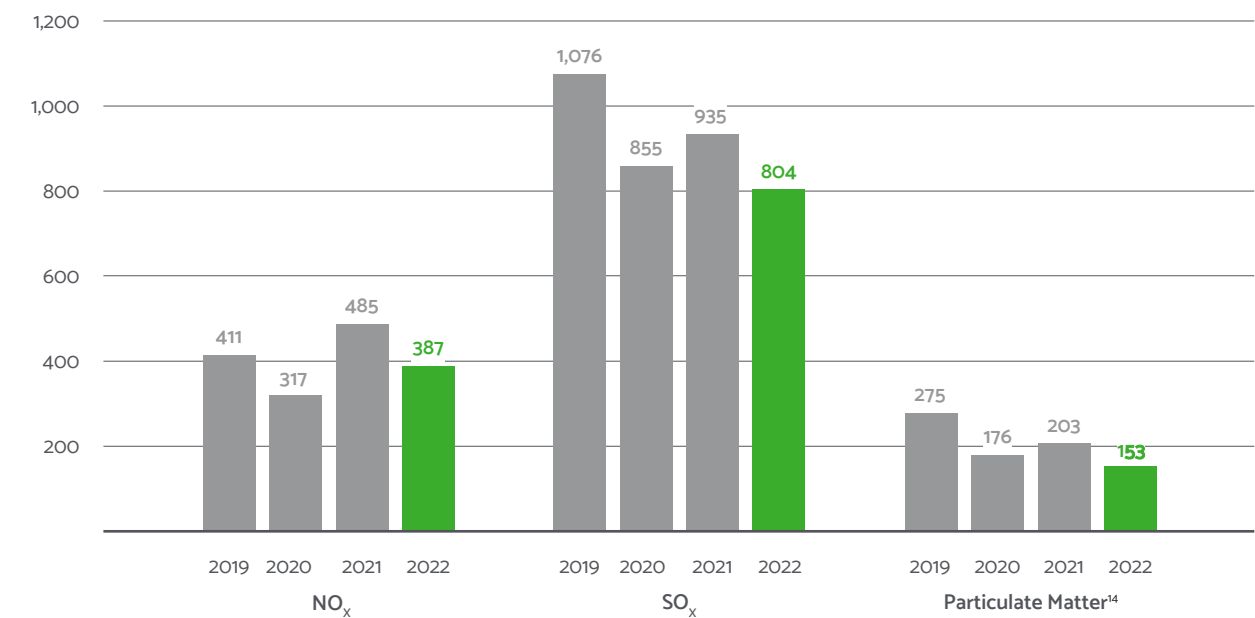
Pamplona Completes Installation of Electric Vehicle Charging Stations

In 2022, Pamplona began installing six electric vehicle charging stations in the parking area of our Pamplona manufacturing facility. The stations were officially opened to employees in January 2023.

The six electric vehicle charging stations feature 44kW Ingerev Fusion chargers, which are manufactured by Ingeteam, feature Ethernet and WIFI communications, and offer the latest functionality, including dynamic load management. The project was sponsored in part by the Institute for the Diversification and Saving of Energy as part of the European Union–NextGenerationEU MOVES III Plan, an incentive program encouraging electric mobility and the improvement of charging infrastructure.

WATER

GrafTech consistently looks to responsibly manage our water consumption, as we recognize water is a critical resource to our local and global communities. Because manufacturing processes can be water-intensive, we have developed programs for capturing and treating water for reuse in our manufacturing processes. Where possible, we have implemented closed-loop systems to further enable water reuse practices. In addition to our processed water, we also collect rainwater and stormwater, which is processed through our on-site wastewater treatment plants and then returned to the manufacturing process. We have effectively reduced the volume of water that we require from sources such as groundwater and surface water because of our ability to capture, treat, and reuse process water, stormwater, and rainwater.

Each site is required to maintain a detailed program outlining surface and groundwater protection procedures and requirements, including practices for monitoring water consumption. Our sites also track the volume of water discharged and conduct periodic monitoring of the nature of the effluent wastewater discharges for compliance with local water quality standards and permit requirements.
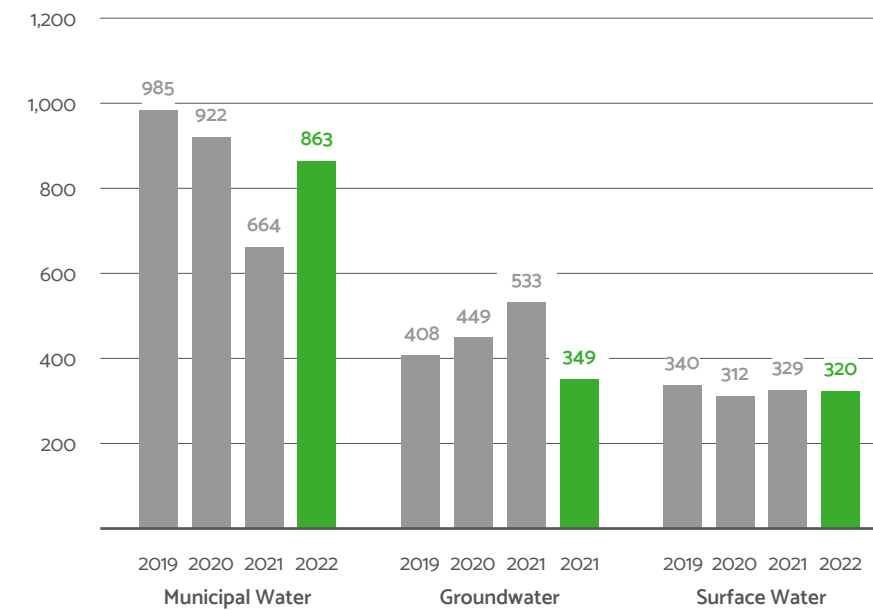
Each site is also tasked with seeking methods for further reducing water use in their operations and reducing local water withdrawal. Pamplona and Calais have established strong on-site recycling and reuse programs. In 2022, the programs recycled a combined 649 megaliters of water.
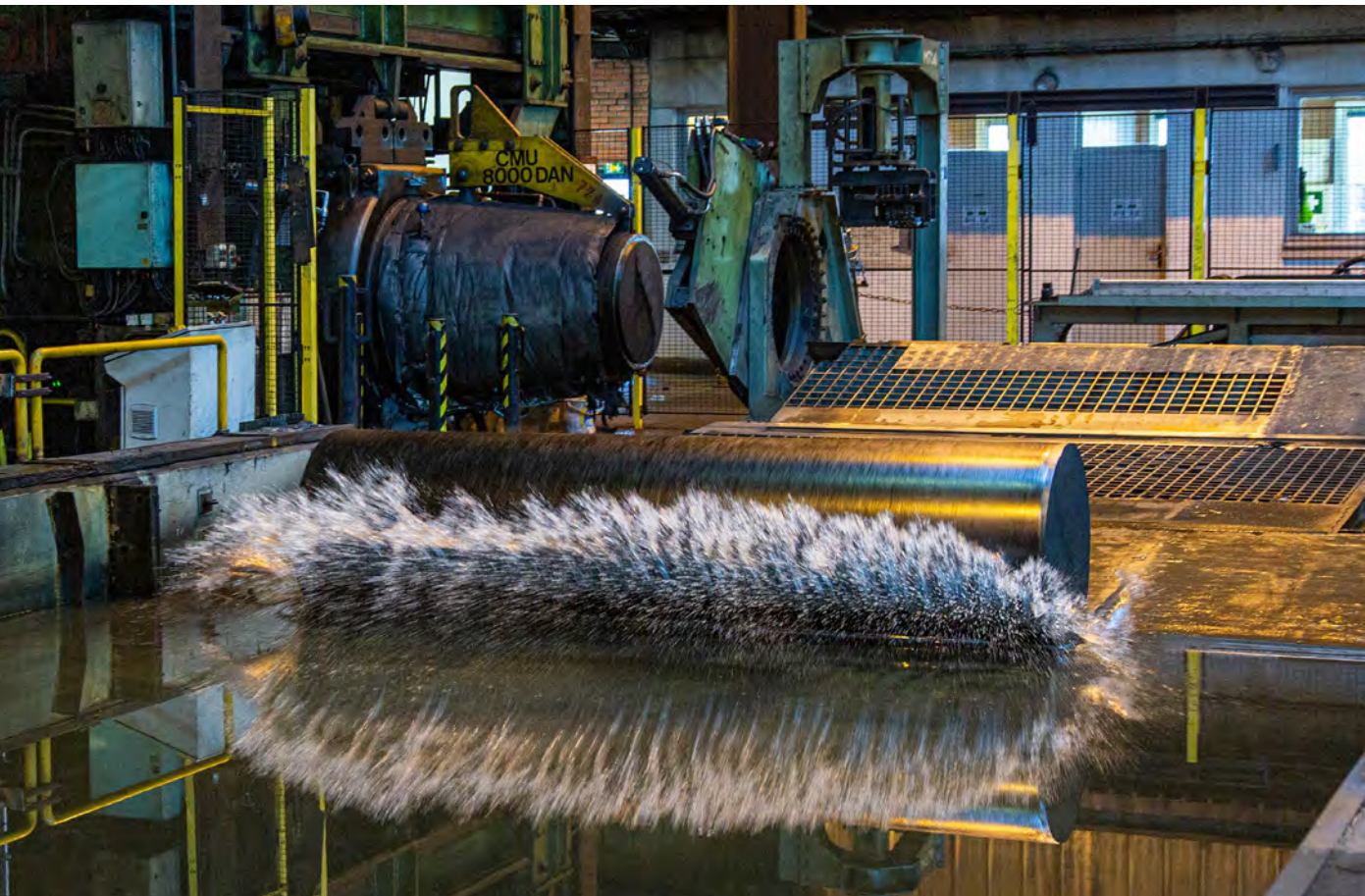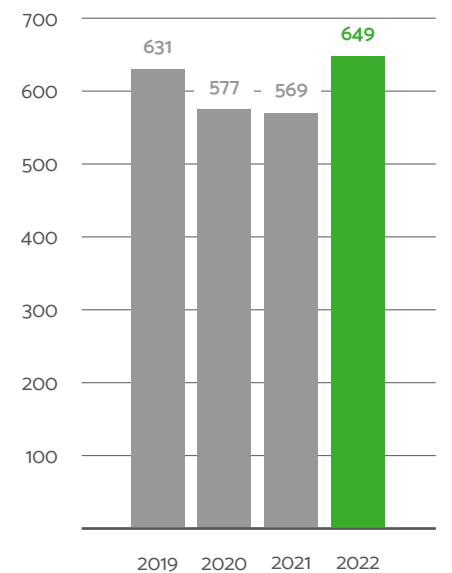
We continue to look for opportunities to expand our water recycling programs to other sites. Keeping our water impact low has become particularly important at our Monterrey facility, which is located in a high water-stress area[15] and experienced a significant drought in 2022. In 2021, we implemented a new water conservation program in Monterrey to better track water usage. The program, which included the installation of a new water metering system that tracks usage data in real-time and detects potential leaks, is designed to foster a "Culture of Water Care" among GrafTech employees. It is paired with training for employees that introduces best practices for water usage. Water usage data is tracked monthly and reported during the site's business review meetings.

Due to the drought conditions in 2022, the wider Monterrey community faced water restrictions. While GrafTech felt the impact of these water management efforts, we were able to make the most of our water recycling and conservation initiatives to support our operations. This water can be used by the local governments to serve the surrounding communities. We also looked for other opportunities to ease the strain on the community, including distributing bottled water to our employees and providing collection jugs so that employees could bring water home to their families.

Total Water Withdrawals[16]
(megaliters)

	Municipal Water	Groundwater	Surface Water
2019	985	408	340
2020	922	449	312
2021	664	533	329
2022	863	349	320

Recycled Water[17]
(megaliters)

2019	2020	2021	2022
631	577	569	649

15   Monterrey, Mexico has been identified as a high water-stress area based on the World Resources Institute Aqueduct™ 3.0 water risk framework. Of GrafTech's operational footprint, 11% is located in regions with high or extremely high baseline water stress. Monterrey comprises the entirety of that percentage.

16   Water withdrawals includes only our manufacturing facilities.

17   Recycled water includes only our Calais and Pamplona manufacturing facilities.

WASTE

GrafTech strives to reduce the volume of waste generated by our operations as a means for minimizing our environmental impact. To reduce both hazardous and non-hazardous waste, we prioritize waste recycling and our participation in the circular economy.

The baking, graphitizing, and machining processes generate spent metallurgical coke and graphite, both of which have commercial value and can be reused. Often, we can reuse these byproducts within our own operations. If we cannot reuse the metallurgical coke and graphite waste we produce, we look to continue the lifecycle of these materials by selling them to those who can. Since 2019, we have reused or sold for beneficial reuse 260,000 metric tons of our graphite and spent metallurgical coke, equating to more than three times the volume of waste that we landfilled during that same time period. We have also made significant progress in reducing waste. Since 2019, we have reduced our generation of hazardous waste by more than 90% and non-hazardous waste by more than 40%.
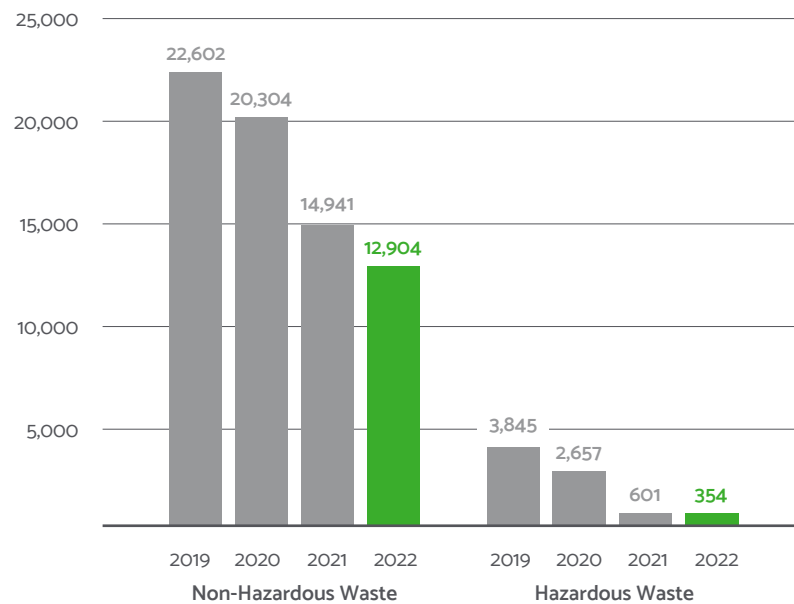
We also recover hydrocarbon vapors at our Seadrift plant that are generated incidentally during needle coke production. Recovered vapors are refined into byproducts including gas oil, naphtha, and fuel gas. These byproducts can then be reused in the process or sold. In 2022, Seadrift generated more than 365,000 barrels of reusable gas oil and naphtha through our vapor recovery program.
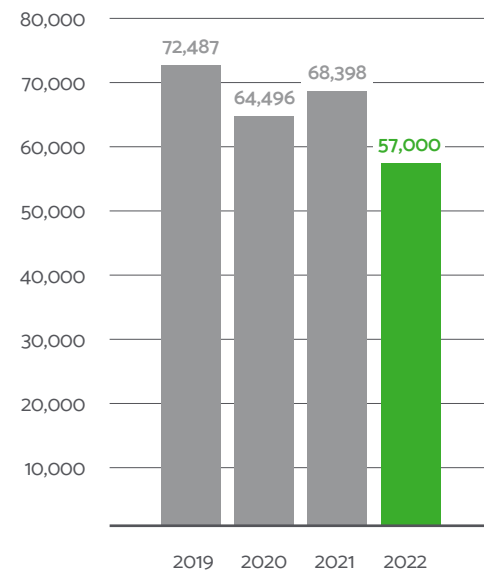
We further engage in the circular economy by using byproducts from other industries. At our Seadrift site, decant oil, a byproduct of the oil refining industry, is used to produce petroleum needle coke. Needle coke and coal tar pitch, which are byproducts of the coal refining process, are the primary raw materials in the graphite electrode manufacturing process. These electrodes are then used to recycle steel through EAF steelmaking.

GrafTech's full cycle of production is reliant on byproducts generated within our own operations and provided by other key industries. Each site maintains an inventory of waste generation and disposal so that we have a complete picture of our investment in the circular economy, our ability to beneficially reuse byproducts, and our environmental impact. Whenever there are significant changes to waste inventory at any of our sites, we record explanations to ensure we identify anomalies and track opportunities to improve.
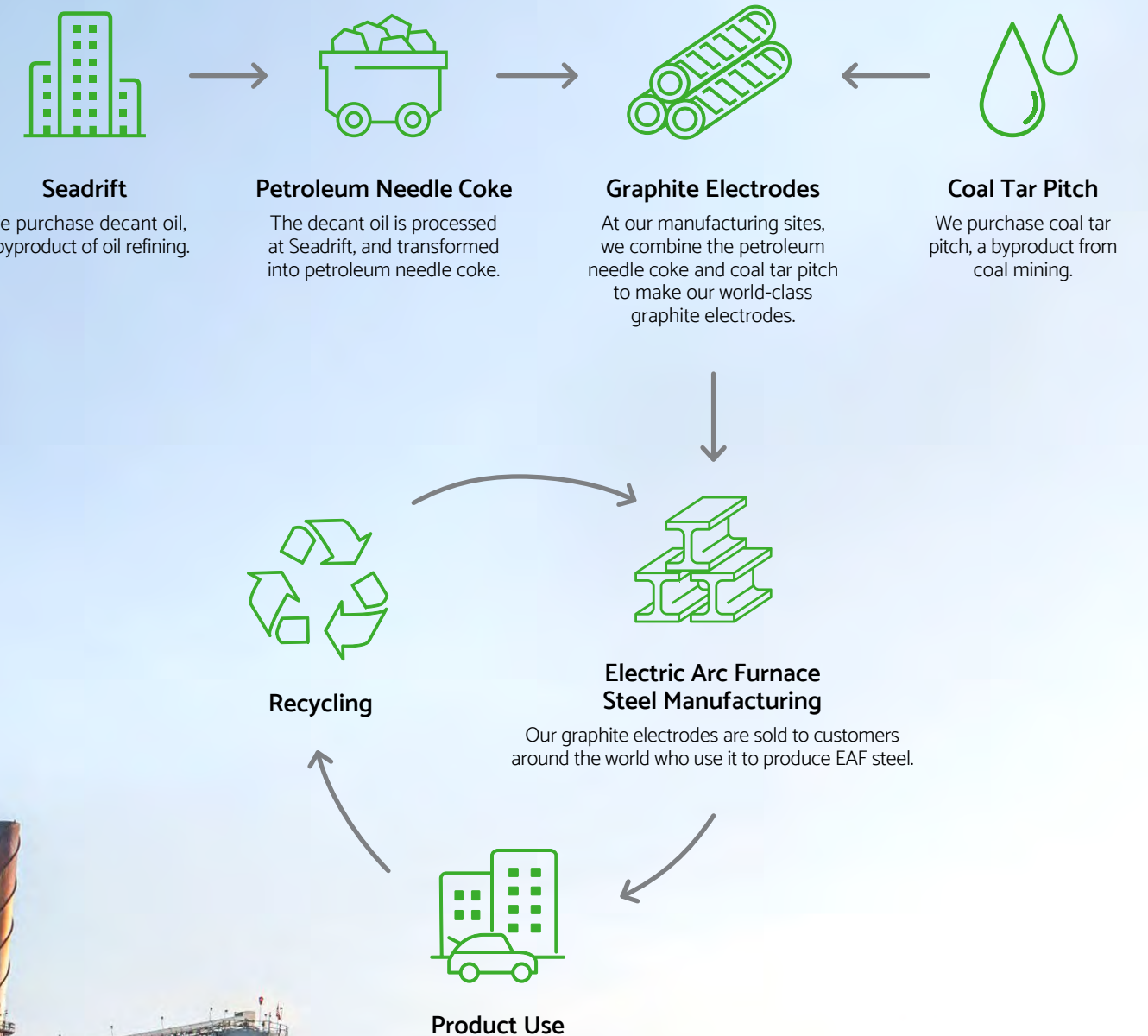
Waste Generated[18]
(metric tons)

	Non-Hazardous Waste				Hazardous Waste			
Year	2019	2020	2021	2022	2019	2020	2021	2022
Value	22,602	20,304	14,941	12,904	3,845	2,657	601	354

Total By-Products to Reuse (metric tons)

2019	2020	2021	2022
72,487	64,496	68,398	57,000

18 Waste generated includes only our manufacturing facilities.

How GrafTech Recycles Oil and Coal Byproducts

Seadrift
We purchase decant oil, a byproduct of oil refining.

Petroleum Needle Coke
The decant oil is processed at Seadrift, and transformed into petroleum needle coke.

Graphite Electrodes
At our manufacturing sites, we combine the petroleum needle coke and coal tar pitch to make our world-class graphite electrodes.

Coal Tar Pitch
We purchase coal tar pitch, a byproduct from coal mining.

Recycling

Electric Arc Furnace Steel Manufacturing
Our graphite electrodes are sold to customers around the world who use it to produce EAF steel.

Product Use

MATERIALS SOURCING

As a global leader in high-quality graphite electrodes, the reliability of our supply base is imperative to our success. We manage the risks and opportunities of raw materials sourcing by creating and maintaining a responsible and reliable supply chain. To mitigate risks from potential curtailments of our operations, we explore and qualify new and alternative raw materials to diversify conventional raw materials.

Our goal is to not only be adaptive in the sourcing of our materials, but to also recognize the ongoing shifts within our supply base toward decarbonization and fossil fuel reduction. We continue to see increased competition from other industrial segments for our raw materials, which compounds existing challenges. For these reasons, GrafTech carefully manages the sourcing of our raw materials to foster a resilient supply chain and enable the delivery of high-quality electrodes to our customers.

Managing Opportunities and Risks in Sourcing

At GrafTech, procurement is divided into two primary teams. The corporate procurement team is responsible for central purchasing activities, as well as monitoring materials sourcing opportunities and supply chain risk assessments, particularly for our key aw materials, including decant oil, coal tar pitch, and petroleum needle coke. This team also focuses on developing and maintaining supplier relationships, ensuring a robust supply chain and timely deliveries. The regional procurement teams engage in more indirect goods and services procurement activities, specifically for the facilities they represent. Their work provides important regional expertise for supplier relations.

This overarching structure is geared toward supply chain security and resiliency. The global procurement team's objectives are to diversify, expand, and identify new raw materials sources while building strong supplier relationships that meet varying regional demands. This ability to foster resiliency within our supply base has been particularly important in recent years, as we have experienced ongoing global supply chain disruptions since 2020.

PRODUCTS

At GrafTech, we strive to deliver the highest performing electrodes to our customers. The combination of our highly engineered products and technical services can help our customers increase productivity and reduce costs, while simultaneously supporting both our sustainability goals and those of our clients. The EAF steelmaking method is more environmentally friendly than traditional methods, and as such investing in our products illustrates a commitment to the effort to decarbonize the steel industry.

As the market for EAF steel grows, we look to innovate and expand our business, continuing to deliver the highest performing electrodes manufactured in a responsible and sustainable manner.

Performance

We continued to experience supply chain disruptions in 2022, including lingering disruptions from the COVID-19 pandemic and new disruptions as a result of the Russian invasion of Ukraine. To offset these challenges, we are developing new programs to further increase our resiliency.

Russia and Ukraine are some of the largest producing countries of metallurgical coke. As such, the conflict between these two countries has created barriers to procuring and securing this raw material. The conflict has also shown larger global economic impacts, especially in the oil and natural gas market. This disruption has increased transportation costs for many companies, including GrafTech, and has more specifically increased the costs of the byproducts from these industries that we rely on for producing graphite electrodes.

Additionally, new regulations in the EU have introduced new requirements for emissions and supplier registration for fossil fuel products, including coal tar pitch, which is a material required in our products. GrafTech will continue to monitor these regulations to better understand how they impact our operations and global supply chain network.

Despite these challenges, in 2022 we remained adaptable and identified ways to overcome certain challenges. As part of this ongoing effort, we are continuing to diversify our supplier portfolio and expand procurement into new regions to provide insulation from ongoing supply chain disruptions.

We have established new relationships with logistics companies to evaluate and manage our inbound and outbound freight. We are capitalizing on opportunities to diversify production at each facility, which has enabled us to better meet local demand for our products, with the added benefit of reducing transportation needs and, consequently, emissions from transportation.

Engaging Our Suppliers

GrafTech is committed to responsibly sourcing and procuring goods and services from business partners that share our commitment to sustainable business practices, particularly as it relates to ESG issues.

Through our supply chain management program, we have continuously evaluated our supplier practices and engaged with strategic suppliers to strengthen our supply chain. In 2022, we began to consider methods for formalizing this evaluation process. We developed a supplier portal through which suppliers can access our Code of Conduct for Suppliers and Contractors, Terms and Conditions, Responsible Purchasing Policy, and other Company standards. We also engaged with a third party to assess our suppliers' ESG programs on behalf of GrafTech. Together, these tools set clear expectations for our working relationships with suppliers, while also enabling us to better evaluate risks related to labor, human rights, environmental concerns, and other ESG issues. Development of the supplier portal was completed in 2022 and was officially rolled out in 2023 along with our supplier ESG assessment program.

We are also in the process of implementing a procurement digitization tool that will allow us to more holistically screen suppliers for ESG-related risks. Our suppliers and vendors have always been expected to comply with the ethics and HS&EP standards outlined in GrafTech's Code of Conduct for Suppliers and Contractors. However, the digital procurement evaluation tools we are looking to implement will take this expectation a step further, providing a more thorough analysis of suppliers' policies and procedures and applying a rating to suppliers dependent upon their ESG-related risks. Several tools for this screening process are currently under evaluation, and we plan to implement a new evaluation system for suppliers in 2023.

Internally, we have also taken steps to formalize our evaluation of supplier practices. In 2022, we introduced our Responsible Purchasing Policy, which provides fundamental guidance for responsibly sourcing materials throughout our supply chain. We have launched three training programs related to the policy for our global procurement team. We saw a 100% training completion rate in early 2023.

PRODUCT QUALITY

Product quality is front of mind as we continue innovating and developing new products and technologies. Our quality assurance engineers and global quality leaders evaluate and monitor quality from design through production to customer use. We have a central quality, product, and process technology team that supports the quality and process technology teams located at each of our manufacturing facilities. Each site tracks and reports on product quality KPIs with senior leadership during business review meetings, including the scrap rate and number of customer quality issues.

In addition, we demonstrate our commitment to customer quality and innovation through our corporate quality policy. Our sites in Calais, Monterrey, Pamplona, Salvador, and Seadrift are certified to meet ISO 9001:2015, a leading international standard that sets forth guidelines for quality management systems and auditing.

PRODUCT STEWARDSHIP

We recognize that our customers seek more efficient electrodes capable of increasing steel production and improving energy efficiency. Product stewardship allows GrafTech to focus on optimizing efficiency while mitigating environmental and social risks and understanding product lifecycle impacts.

Following the temporary shutdown of our Monterrey facility in 2022, we identified opportunities to diversify production across our manufacturing footprint. We have recently begun to expand production capabilities at Pamplona and St. Marys, building in redundancies for critical processes and products. This shift in production is enabling us to build a more robust manufacturing system, ensuring that our value chain is not dependent on any single plant and, ultimately, making our overall operations more resilient.

Expanding production capabilities across our sites aligns with the goals that underpinned our technology roadmap. The roadmap, which was originally outlined in 2021 and formalized with associated goals in 2022, emphasizes the importance of product and process developments. Broadly speaking, the roadmap is designed to push our advancements in technology to consistently provide the best products for our customers. The roadmap includes investments in proprietary instruments and programs, and it refocuses our R&D efforts on key strategic areas.

Typically, our graphite electrodes are fully consumed in the EAF operation for which they are designed. However, in certain situations, if an electrode fractures, GrafTech can re-machine the graphite piece for reinstallation in the EAF electrode column. By recycling this fractured electrode, the CO_2 emissions emitted in the reconditioning process are minimal, particularly in comparison to the emissions produced by the manufacturing of a new graphite electrode.

SPOTLIGHT

Introducing Resin-Based Pins to Our Joint Locking

In 2022, the Product Stewardship team announced a breakthrough in the thread joint locking system that will allow production to phase out the use of coal tar pitch in favor of a resin-based material.

The introduction of a resin-based joint locking system is an important first step in the transition from coal-derived raw materials, and it illustrates GrafTech's commitment to identifying and using alternative materials while still producing graphite electrodes of the highest quality.

We continue to explore opportunities for reducing our dependence on fossil fuels, including ongoing explorations of alternative feedstock to conventional raw materials.

Innovation

At GrafTech, R&D is fundamental to developing products that meet customer needs. Additionally, testing and evaluating new raw material suppliers and investigating opportunities can help us use materials with a smaller environmental footprint. We invest in R&D to help drive product and process innovation and remain a leader in the graphite electrode market. We believe that our intellectual property, consisting primarily of patents and proprietary know-how and information, is important to our growth. Our intellectual property portfolio is extensive with over 125 U.S. and foreign patents and published patent applications.

Our R&D team is a fundamental contributor to our technology roadmap. The team works closely with the technology, engineering, and product quality teams, as well as our individual sites, to develop new products and process improvements. They focus on developing trials, responding to manufacturing practice changes or regulations, and implementing new equipment and technologies.
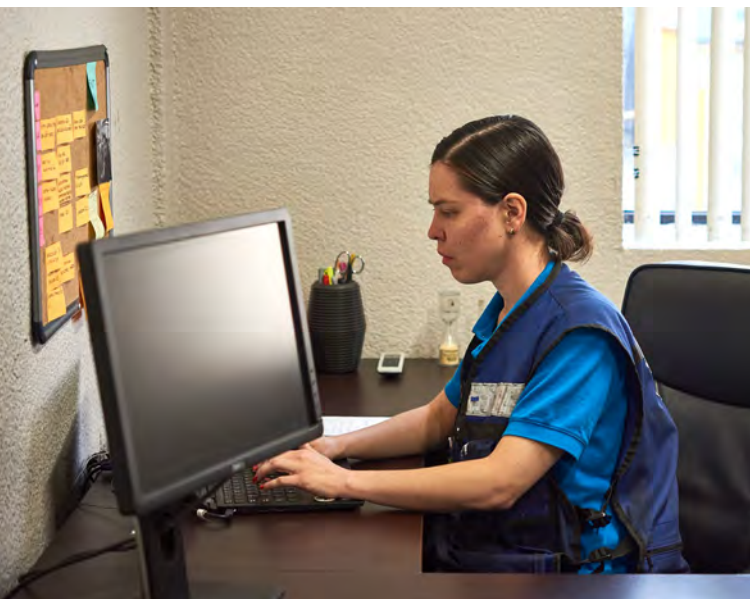
Growing R&D to Further Innovation

In June 2022, the R&D team expanded their laboratory space, adding 10,000 square feet of new space and refurbishing an additional 5,000 square feet. The facility is home to new processing and analytical equipment that is geared towards further investigating the properties of our raw materials and graphite, which may be used to identify ways to improve our product performance.

The space will also allow for more collaboration between our R&D, technology, and engineering teams to trial and implement new equipment and technologies in the electrode production process. Additionally, we have shown continued commitment in this area by increasing spending on R&D investments by 36% since 2019.

Over the last year, GrafTech's R&D team has further driven innovation by fostering collaborations with universities across the United States. The university-based programs have focused on training and tactical support, particularly related to raw materials qualifications and characterization. We currently maintain collaborations with Case Western Reserve University in Ohio and The University of Tulsa in Oklahoma.
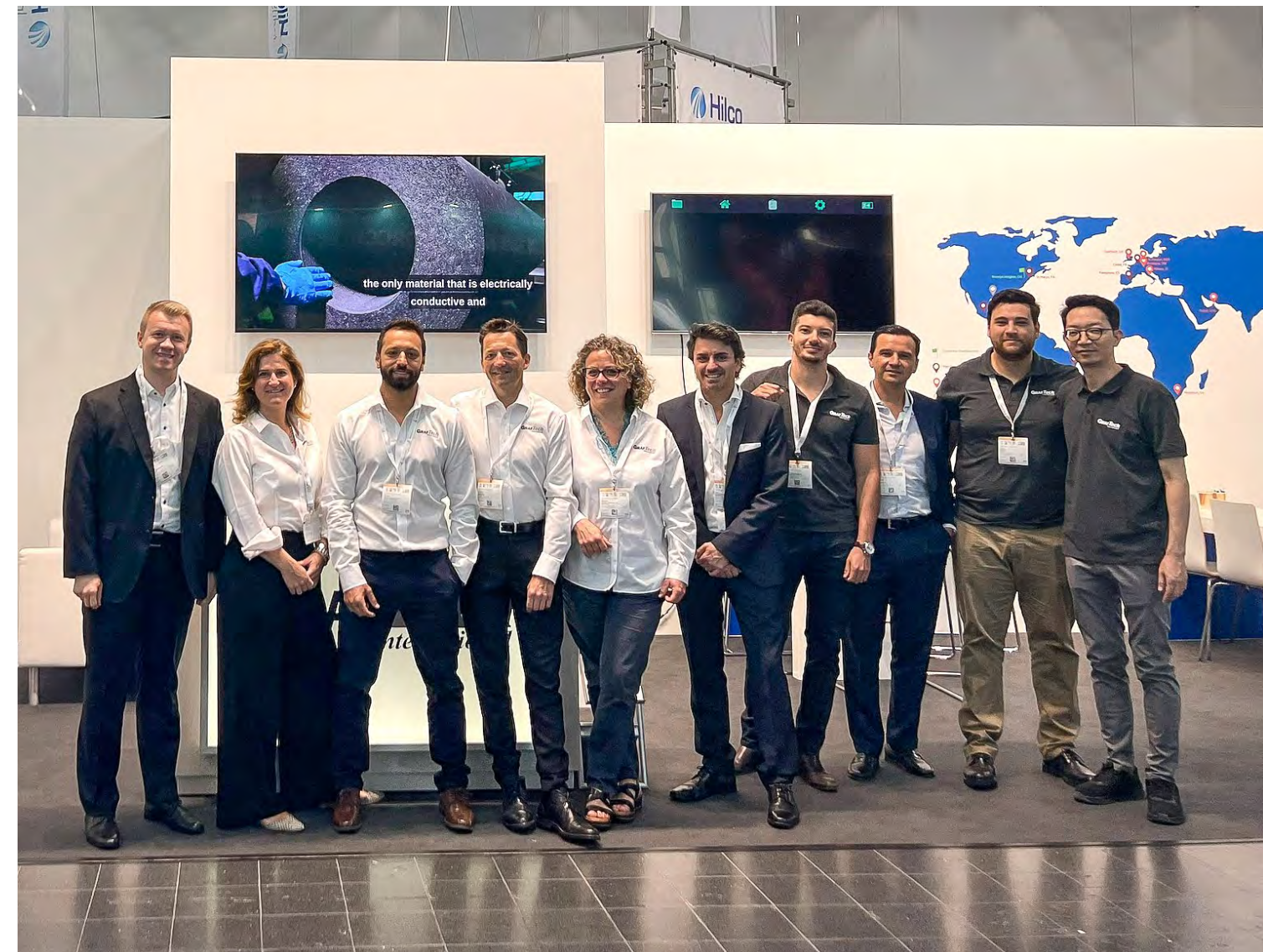
CUSTOMER SERVICE

At GrafTech, we are committed to working with our customers to develop tailored solutions to help them push the boundaries of their melting operations. Together, our Sales, CSR, and CTS teams leverage their collective industry experience to guide the safe and correct use of our products, optimize production efficiencies, and foster product satisfaction. Our combined commercial and technical services represent a unique market offering that demonstrates our commitment to customer solutions and efficiency.

Customer service efforts are cross-functionally monitored to help promote quality. Our Directors of Sales, CTS, Quality, R&D, and Technology and Innovation work closely to track issues and trends related to products and customers. We use customer service-specific KPIs to help us meet customer needs. We share customer reports during weekly and monthly meetings, and project details and KPIs are shared with the Board of Directors quarterly.

CUSTOMERS

Our Sales, Customer Services Representative ("CSR"), and CTS teams are deeply invested in our customers' ability to successfully conduct their melting operations using our graphite electrodes. Together, our products and our teams provide excellent technical service, including one-on-one guidance and technical assistance to help our customers increase productivity, reduce costs, and improve safety.

Our Sales, CSR, and CTS teams operate from 14 different countries, providing support to our customers in more than 50 countries, ensuring that every GrafTech customer has access to valuable support. We believe this comprehensive network of engineers further enables our ability to deliver superior products and services and sets us apart from our competitors.

Customer Technical Service

At GrafTech, we view CTS as a critical collaboration tool for sharing product expertise and knowledge with our customers. It is a key opportunity for our teams to help customers increase productivity, reduce costs, and improve safety. Our global, multidisciplinary network of experienced professionals provides collaborative support to customers, troubleshooting issues, finding solutions, increasing efficiency, and enhancing product satisfaction.

Customers can also provide feedback on product quality issues to any of our 22 CTS engineers. All reported issues are tracked by our customer service team. Working side by side with our customers, our CTS and Quality Assurance ("QA") engineers first identify the root cause of the issue and then develop solutions or corrective actions. On average, it takes less than 40 days to close customer claims. In 2022, we saw a 17% reduction in the number of customer claims per metric ton of produced goods. This reduction is in addition to a 24% reduction in the number of claims we saw the previous year, and the overall year over-year downward trend is indicative of strong product quality and continuous improvement.

ArchiTech Furnace Productivity System

GrafTech powers the ArchiTech Furnace Productivity System 6.0 with our technical experts to track electrode performance, measure overall efficiency, and perform diagnostic testing.

ArchiTech is leveraged by our CTS team to collect pertinent data that we use to address customer needs. The system enables our engineers to work remotely with customers to improve performance and provide real-time diagnostics. As a result, ArchiTech adds customer value through increased production capacity and efficiency, as well as reduced costs and waste.
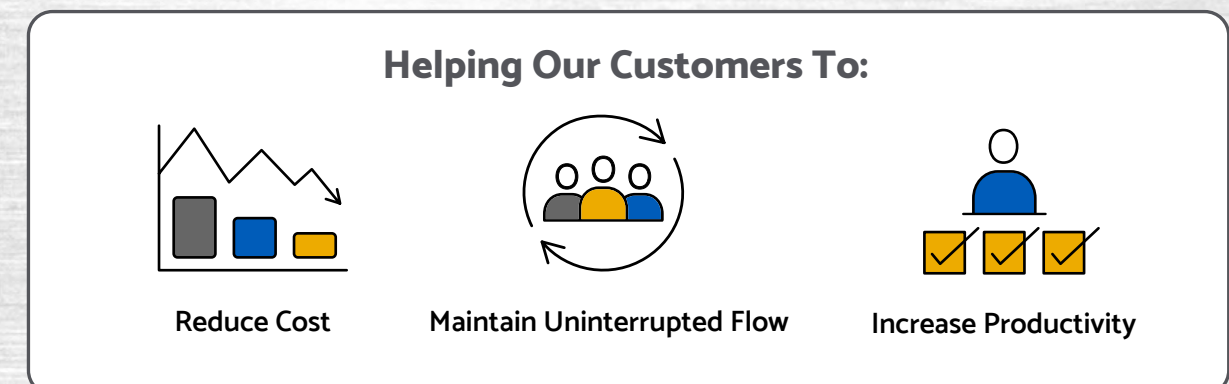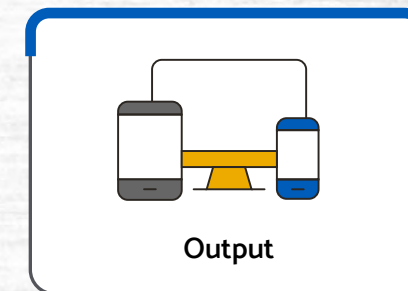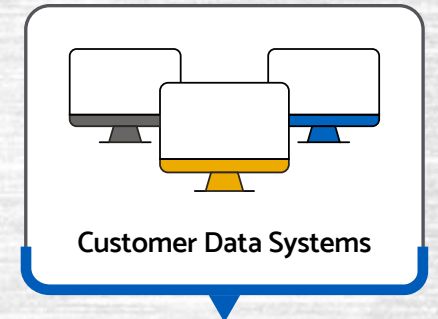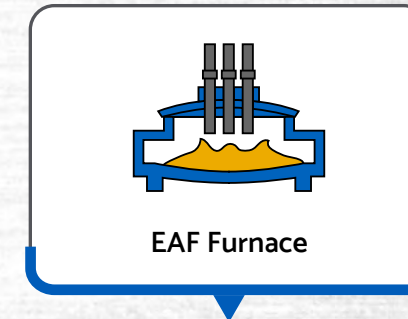
We have installed ArchiTech at more than 250 sites in over 45 countries. We continue to see year-over-year growth of the ArchiTech system. In 2022, we increased the number of systems installed at customer locations by 12% from 2021. Ongoing adoption of ArchiTech by our customers illustrates the analytical power of the system and its ability to optimize performance. Customers have reported improved electrode consumption, energy consumption, and regulation directly through the ArchiTech feedback tool. Customers have called the system "invaluable in its ability to identify problems and improve both operations and maintenance." In 2022, one customer in the Americas used the system to minimize their EAF low pressure events, which resulted in increased productivity and reduced energy consumption. Other customers were able to resolve mast hydraulic issues and correct imbalances, which ultimately improved electrode consumption within their systems.

GrafTech also provides the GrafTrack Electrode Monitoring System,[19] which is our electrode tracking and reporting technology designed to help customers track and manage their electrode inventory more efficiently.

The collective data from our customer service programs, including both ArchiTech and GrafTrack, represents the voice of the customer. This data empowers our teams to proactively address customers' needs. Additionally, the data is leveraged by Sales, CSR, and CTS engineers to identify issues and implement solutions that improve the customer experience, GrafTech products, and our technical services.

19   The GrafTrack patent has been issued or is currently pending in various countries.

ArchiTech Service Vision

GrafTrack®

EAF Furnace

Customer Data Systems

ArchiTech
FURNACE PRODUCTIVITY SYSTEM

Monitors Energy, Power, and Power Quality

24/7/365 Advanced High-Speed EAG Diagnostic Analysis, and Reporting System

Output

Helping Our Customers To:

Reduce Cost

Maintain Uninterrupted Flow

Increase Productivity

COMMUNITY

As a global manufacturer and local employer, we understand the important role we play as corporate citizens. We are committed to acting as responsible stewards in our local communities. Protecting our employees, our local environments, and our neighbors while simultaneously investing in community programs is fundamental to our operations.

COMMUNITY ENGAGEMENT

Promoting Healthy Communities

Since 2019, GrafTech has been working in Monterrey to reforest our plant site and contribute new growth to the local tree canopy. More than 1,000 trees have been added to our site since our tree planting program began four years ago, and 500 more trees have been planted throughout the community because of volunteer efforts spearheaded by GrafTech employees. Additionally, we have relaunched our onsite nursery for cultivating our own trees.

In 2023, we began a program in partnership with local schools in Monterrey to bring students to the nursery for hands-on learning opportunities. These school visits introduce local flora and fauna to students and culminates with an opportunity to participate in seed and tree planting on our site.

As our Seadrift facility has done for years, the Safety with Action Through Teamwork ("SWATT") team led our annual food drive in 2022. Donations went directly to local families in Texas.

In Salvador, Brazil, we invited employees and their families to the facility for a Community Visit program in December 2022. The program featured a presentation on environmental protection efforts, including how we promote the health and safety of our employees and the local community, as well as a site tour.

Charitable Partnerships

Employees from our headquarters in Brooklyn Heights participated in the Greater Cleveland Heart Walk sponsored by the American Heart Association in September 2022. Hosted in Downtown Cleveland, this annual walk raises funds for medical research and spreads awareness for heart health.

In the United States, we have partnered with United Way for over 40 years. United Way focuses on education, income, and the health of communities around the world. In recent years, we have increased our corporate contributions to United Way and continue to look for opportunities to expand this important partnership. In addition, we also combine efforts with our customers to help support the communities where our customers operate and where our products are used.

EXPANDING COMMUNITY ENGAGEMENT INITIATIVES

Community engagement has long been an informal initiative spearheaded by local teams at each GrafTech site. In 2022, we looked to formalize these initiatives by launching employee engagement committees at each facility. On-site engagement committees focus their efforts on developing and implementing projects and initiatives that deepen our connections to the communities in which we operate. In 2023, we have set a community engagement goal for each site to host four events annually. We are looking forward to the work that our employee engagement committees are spearheading this year to realize our engagement goals and better connect our work with our local communities.

To further incentivize employees at our sites, we have included community engagement as a key component of our ESG-linked compensation initiative, which we launched in 2023. Learn more about ESG-linked compensation in the **Governance** section of this report.

SPOTLIGHT

Annual Seadrift SWATT Calendar Highlights Families

In 2022, the SWATT team hosted its third calendar program. The program invites children of Seadrift employees to submit original artwork of their favorite family activities, and selected artwork is featured in a 12-month calendar that is produced and distributed to employees. The calendars are also displayed throughout the Seadrift plant and help communicate shift schedules, pay days, and site holidays.

SWATT is an employee-driven safety and community-building initiative unique to Seadrift, as well as a critical component for Seadrift's maintenance of their Occupational Safety and Health Administration Voluntary Protection Programs site designation. The SWATT team, in collaboration with the facility management team, offers safety communications, trainings, and programs for employees, as well as community events and fundraisers, in addition to the annual food drives and calendar program highlighted here.

WORKFORCE

Our employees are our most valuable asset, and we are committed to ensuring their safety and professional growth at GrafTech. Not only is it our responsibility to take care of our employees' physical wellbeing, but we also work to ensure our employees feel accepted and valued at GrafTech. We care for our workforce by fostering their career development through learning opportunities and skills training.

As GrafTech continues to attract a global and diverse talent base, we seek candidates who share our core values, particularly our commitment to maintaining a safe and healthy work environment. Many of these candidates come from the local communities in which we operate.

WORKFORCE DIVERSITY

As a global enterprise, we believe diversity is foundational to maintaining a competitive workforce in our industry. Unique perspectives promote business innovation and excellence. Therefore, we seek to hire candidates with different backgrounds and experiences as a means of fostering inclusivity. Our goal is to build an intentional, inclusive community that celebrates differences.

Diversity and inclusion are foundational to our culture, and all employees are expected to uphold these values in their day-to-day work. Our recruitment policies and hiring practices support our diversity and inclusion objectives. At both the corporate and site levels, we assign responsibilities for upholding policies, procedures, and practices for diverse and inclusive hiring and talent management. GrafTech affirms its position as an Equal Opportunity Employer and is committed to recruiting, employing, and promoting qualified veterans and disabled individuals, and we aim to ensure our people have equal opportunities related to job promotions, compensation and benefits, and personal development.
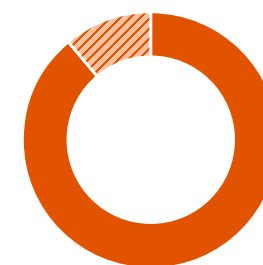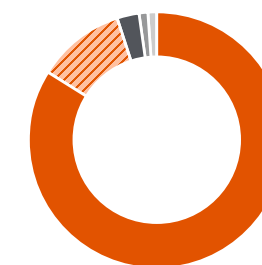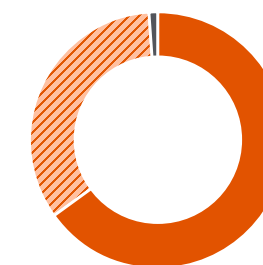
Our global footprint organically lends itself to diversity, and our employee base has varied educational and technical backgrounds and life experiences. We strive to go beyond this organic diversity, and we are currently developing a strategy to better measure our ability to do so. Currently, 33% of our senior leadership team and 25% of our Board members are female. We are committed to intentional talent acquisition, retention, and development practices to support our diversity initiatives and to build a competitive workforce.

Employee Gender Diversity[20]

- **1,201** male
- **146** female

U.S. Employee Race and Ethnicity Diversity[20]

- **277** White
- **36** Hispanic and Latinx
- **11** Black
- **3** Asians
- **2** Two or More Races or Other

Employee Geographic Distibution[20]

- **885** Americas
- **455** EMEA
- **7** APAC

Employee Classification[20]

- **815** hourly
- **532** salaried

20 As of December 31, 2022.

OCCUPATIONAL HEALTH AND SAFETY

Health and safety in the workplace is paramount at GrafTech. We value our people and are committed to supporting them in whatever role they have–whether they are on the plant floor, meeting with our customers, or in the board room.

Health and safety serve as the foundation for everything we do. We implement programs and procedures that drive health and safety excellence and have established management and reporting procedures to track health and safety KPIs. We believe the skills it takes to execute an industry-leading health and safety program are the same skills required to be successful throughout our entire business operation.
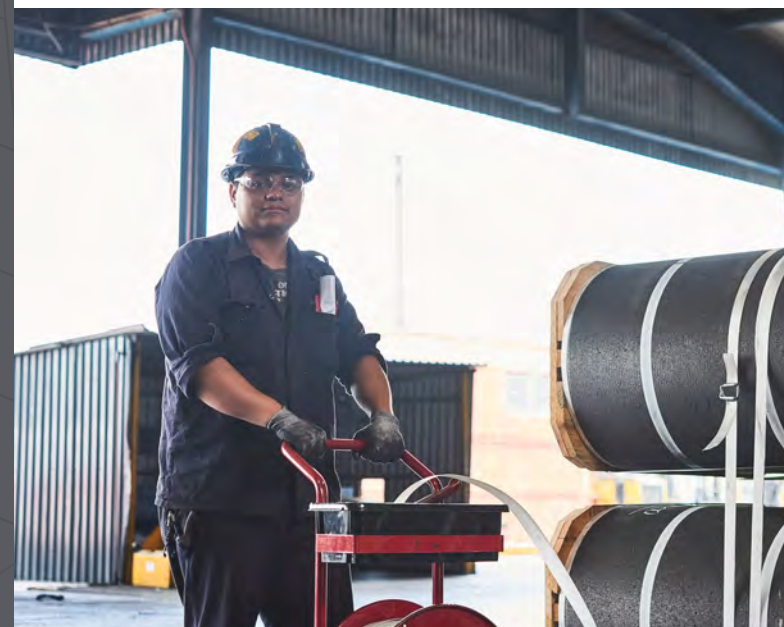
The GrafTech health and safety strategy focuses on fostering an environment where our employees thrive and where we maintain a productive, unified workforce. We aim to provide the support and care necessary for our employees' overall well-being. In this environment, we emphasize effective leadership, accountability, engagement, and proactive communication to maintain our high health and safety standards. Every employee has a role in fostering a culture of health and safety.

Health and Safety Management

We embrace a culture with a shared commitment to health and safety excellence. Each employee has the responsibility to create a safe working environment for themselves and their coworkers. Site management at each location is responsible for overseeing the site's process for gathering input on health and safety risks and creating action plans to reduce risk to the lowest possible level. In addition, production employees and management identify risks during site activities, including training, audits, leadership visits, and pre-job planning. Each year, the sites work with HS&EP at the corporate level to identify which leading indicators will be tracked and to establish targets for our indicators. Identified targets and associated metrics are reported to senior leadership monthly.

The SafeStart program at GrafTech is designed to address unintentional human error and critical safety habits by focusing on behaviors and conditions. The program centers around a series of modules that are repetitive in nature to help employees create safety habits at home and work. The SafeStart program, in collaboration with HS&EP, also asks employees to share "near miss" experiences, in which safety was almost compromised, or injuries. Sharing these experiences allows the team to troubleshoot real scenarios and create plans to prevent these issues from reoccurring in the future. The SafeStart program has been implemented at our Salvador, Seadrift, and Monterrey sites, and will be launched at St. Marys in 2023.

In a post-pandemic world, we continue to focus on keeping our people healthy while ensuring business continuity. Our senior leadership, HR, and health and safety teams have worked tirelessly to manage our response policies, practices, and programs. We continue to pursue opportunities to support our workforce and minimize the sustained impact the COVID-19 pandemic has had on many individuals within our community. This focus remains a top priority and reinforces our core value of ensuring our employees feel safe walking into work every day.

SPOTLIGHT

Health, Safety, and Environmental Protection Week in Salvador, Brazil

In October 2022, GrafTech held an HS&EP Week at our Salvador plant. Employees and contractors presented 19 projects for continuous improvement in safety. Presentation topics included fire safety and system responses, demonstrations for avoiding domestic incidents, liability for injury involvement, and work-related injury awareness promotion and prevention.

Employees also had the opportunity to learn more from a local physiotherapist about organizational ergonomics, a practice that promotes a harmonious and productive coexistence between employees and their work environment. These sessions focused on topics such as organizational culture, methods of communication, home office environments, quality management, and temporal mode of work.

The week concluded with the launch of the Program for the Development of Safety Awareness; a program designed to maintain a zero-injury environment at the Salvador plant. Programs such as these are key to the Salvador site operating without a recordable injury for more than four and a half years.

Communication and Reporting

At GrafTech, we hold employees at all levels responsible for upholding our health and safety standards and practices. Our "Take Two for Safety" program has been fully ingrained into our business practices. The program, which encourages employees to take two minutes to review, understand, and ask questions about the task they are to complete prior to starting work, is embedded in our daily work. If at any point an employee feels a job is unsafe or they are unsure of the proper way to perform a task, they are empowered to stop work immediately. Employees can report a potential hazard or safety concern at any time. Concern reporting is a critical tool for maintaining employee safety, and our real-time reporting system uses a computer or mobile app to give employees ownership of their well-being while also helping to drive safety improvement.

Conversations at all levels of management, including the senior leadership team, help ensure that health and safety remain a top priority at GrafTech. Safety committees at each manufacturing site, consisting of both management and hourly workforce members, meet at least once a quarter. They focus on evaluating site health and safety issues, performing periodic inspections, and sharing corrective actions for near misses, particularly where similar equipment or operations are employed.

In 2022, we completed HS&EP audits at 100% of our manufacturing sites.

Management team members, up to and including our CEO, meet monthly to review incidents and corrective actions; share best practices among the sites; and discuss health and safety metrics, issues, and emerging topics. During monthly leadership calls, site managers present health and safety metrics to senior leadership. Additionally, a summary of these health and safety metrics and significant safety initiative updates are presented to the Board quarterly.

Our health and safety management system is the foundation of employee safety at GrafTech. The system is key to driving our incident rate to industry lows and creating and maintaining a safe work environment for our employees, contractors, and visitors. To address these risks, we emphasize:

- personal safety;
- incident reporting;
- job safety analyses;
- change management;
- internal and external audits;
- contractor management;
- hazardous work;
- occupational health; and
- environmental management.

We conduct regular inspections, internal reviews, and corporate audits at our sites to ensure our health and safety management system fosters compliance with our high standards. Corporate audits include a review and evaluation of site programs and documents, site walk-throughs, employee interviews, and an overall evaluation of the HS&EP program's effectiveness. Audits are conducted using our cloud-based health, safety, and environmental software platform. Our auditors use the software platform to answer questions regarding the site's HS&EP management systems, as well as regulatory compliance. At the conclusion of the audit, the sites utilize the system to establish and track completion of the corrective actions.

GrafTech uses a combination of internal and third-party auditors, as well as in-person and virtual visits, which gives us flexibility in how and when we complete HS&EP audits for all the sites. In 2022, we completed HS&EP audits at 100% of our manufacturing sites.

SPOTLIGHT

Safety Highlighted During Seadrift Planned Shutdown

In 2022, our Seadrift plant had a planned operational shutdown for 30 days to allow for routine maintenance and equipment upgrades. During this time, there were approximately 450 contractors on site to perform the necessary work.

Seadrift was pleased to report zero recordable injuries or incidents during the planned shutdown. Furthermore, Seadrift has operated for more than two years without a reportable injury to any employee, and more than 10 years without a lost time injury.

Performance

Monitoring and disclosing safety indicators at GrafTech is one of several ways that we maintain strong health and safety performance. Our leading safety indicators include pre-job plan assessments and PJOs conducted, training hours completed, corrective actions associated with inspections and concern reporting, permit reporting, and inspection requirements. In 2022, we also tracked and reported first-aid and near-miss cases as a part of our safety indicators. In 2023, we have added new leading indicators which will track progress on two newly enhanced programs: task level risk assessment, and Safety Leadership for Supervisors.

Safety Training and Engagement

Our comprehensive safety training program for our employees covers all GrafTech programs and on-the-job training, as well as local regulations. Additionally, employees participate in job-specific health and safety programs. New employees in our plants are required to complete training, which includes working with a more senior employee until they obtain the knowledge and skills necessary to safely perform their job duties. GrafTech requires each job to have a Job Safety Analysis ("JSA") performed, which details the potential risks of each job step and the associated safety requirements. Each new employee reviews one or more JSAs as part of their on-the-job training.

Planned Job Observations ("PJOs") is a process in which managers can observe a job being done to verify that employees are working safely; this process validates that the JSA has identified all key job risks. This is another example of how our managers and employees engage with each other to maintain a safe work environment.

In 2022, we reinstated employee travel between sites, which had been suspended in response to the COVID-19 pandemic. We implemented our "Fresh Eyes" campaign, in which visiting employees from other facilities are asked to complete observation sheets during their time on site. These observations enable local management to see their sites through new eyes and to identify potential safety issues that may have gone unnoticed simply because of familiarity with the site environment. This initiative underlines our commitment to constant improvement and safety.

In 2022, GrafTech employees completed 47,650 hours of employee health, safety, and environmental training.

In 2022, GrafTech employees completed 47,650 hours of employee health, safety, and environmental training. For 2022, our employee Lost Time Incident Rate[21] ("LTIR") was 0.50, and the employee Total Recordable Injury Rate[22] ("TRIR") was 0.94. While these rates continue to place us among the top operators in the broader manufacturing industry and represent a significant improvement since 2018, they did not meet our high standards. Safety is and must be fundamental to everything we do at GrafTech. For this reason, improvement in our safety metrics will be a key emphasis in 2023, particularly as we continue to work toward our ultimate goal of zero injuries. To align safety performance with annual cash incentive awards, in 2023, the HR & Compensation Committee introduced modifications to the STIP that explicitly link TRIR performance with incentive awards.

21   LTIR measures lost injuries per 200,000 hours worked.

22   TRIR measures recordable incidents per 200,000 hours worked.

Safety Performance Highlights

Employee Lost Time Incident Rate ("LTIR")

Employee Total Recordable Incident Rate ("TRIR")
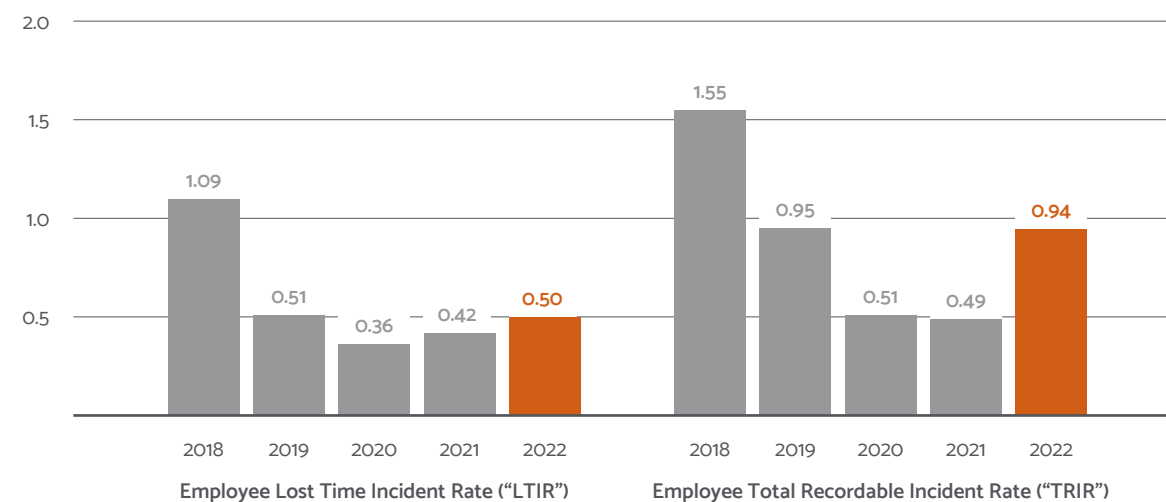
WORKFORCE MANAGEMENT

Our global team of more than 1,300 employees is the key to our success. We are committed to the physical, mental, and financial wellbeing of our entire workforce, and have developed benefits and programs in these three key areas of wellbeing to support our employees. Employees are also empowered to manage their personal and professional development through internal and external training and education programs, designed to develop and refine their work-related skills.

Through these employee benefits and programs, we have invested in our manufacturing expertise, built upon our ability to provide superior customer service, and have seen significant business growth.

In 2022, GrafTech enacted a new hybrid work policy that offers flexibility for our office-based employees. GrafTech believes a formal hybrid work arrangement can create advantages for both the Company and its employees, including increased productivity and performance, enhanced employee recruitment and retention, greater work-life balance, and increased job satisfaction.

Employee engagement is a priority at GrafTech because we believe that engaged employees help us provide high-quality products and services to our customers. In October 2022, we completed our first global employee engagement survey, which requested feedback from our employees on a variety of important topics, including safety, pay, communication, and training. Key highlights from this inaugural survey include:

- **Pay:** More than two-thirds of GrafTech employees believe they are paid fairly

- **Benefits:** 81% of employees feel they have the flexibility necessary to balance work and personal responsibilities

- **Collaboration:** 92% of employees work in departments or on teams that help each other, even if doing so is beyond their core job responsibilities

- **Support:** 93% of employees feel they are treated with respect at GrafTech

- **Understanding:** 90% of employees have a clear understanding of GrafTech's goals and objectives

- **Contributions:** 94% of employees understand how their work contributes to GrafTech's goals

Approximately 56% of full-time GrafTech employees participated in the inaugural survey. Though we were very pleased with this engagement, we have set an internal goal to increase participation in the next survey to 65% of our workforce. The survey responses helped us identify opportunities to further engage with our employees.

The next survey will be distributed in 2024, and we intend to conduct engagement surveys every other year moving forward.

Talent Acquisition

We seek potential employees who are passionate, innovative, and driven–whether they are working at one of our manufacturing sites, our sales offices, or our headquarters in Ohio. Our interview process aims to identify such candidates, and we look to evaluate the competencies that are most critical to success in their field. In order to ensure candidates share our company values, we ask questions throughout the interview process related to our five core competencies:

- Health, Safety, and Environment;

- Customer Focus;

- Drive for Results;

- Ethics and Values; and

- Peer Relationships.

We focus on recruiting local talent from the communities in which we operate, an imperative practice that allows us to connect with and uplift these communities. At our Calais plant, our Apprentice Program provides local high school students, as well as those who are currently completing secondary degree programs, with work experience in various GrafTech departments, including maintenance, engineering, HS&EP, procurement, quality, and continuous improvement.

In 2022, Calais participated in The Village de la Chimie, a large student fair hosted at Artois University in Arras, France. The fair, which invites local students to participate in chemistry activities and learn about employment opportunities in the chemical industry, brought approximately 800 students together. The students, ranging in age from 14 to 20 years old, had the opportunity to meet with members of GrafTech's process engineering and human resources teams.

TALENT ATTRACTION AND RETENTION

We aim to attract and retain top talent from a diverse pool of skilled workers by providing competitive compensation and benefit programs to help meet the needs of our employees. Our programs are designed to support the profitable growth of our business; attract, reward, and retain the talent we need to succeed; support the health and overall well-being of our employees; and reinforce a performance-based culture.

In addition to base compensation, we offer individual and group-based performance bonuses. Benefits packages include, depending on the country, medical, dental, prescription, vision, group life insurance, short- and long-term disability, paid vacation and holidays, and tuition reimbursement. The tuition reimbursement program, in particular, helps employees who want to continue their education or seek specialized job training, and illustrates our commitment to continued learning and focus on professional development.

GrafTech St. Marys Hosts Dutch Manufacturing Program Students

In December 2022, GrafTech St. Marys hosted ten students from St. Marys Area High School's Dutch Manufacturing program for a site visit and tour. The students had the opportunity to learn about the organization's history, the graphite electrode manufacturing process, and the skills needed to succeed in a manufacturing career.

Dutch Manufacturing is a new program in its first year at the high school. It is focused on developing students for success in the manufacturing sector and introduces students to post-secondary education opportunities in the field, as well as apprenticeship and internship programs. Travis Reed, the HS&EP manager at St. Marys, has been an active member of the Dutch Manufacturing program advisory board since 2021.

Performance Management and Talent Development

As committed stakeholders in the professional development of our employees, GrafTech looks for opportunities to help employees grow, innovate, and impact our business and industry. Each role within our organization has a detailed job profile, including job-specific competencies. These profiles help us measure performance, and they work in conjunction with our performance management system, which enables employees to create individualized career and growth paths. The performance management system connects employees with job-specific professional development training and continuing education opportunities to help them progress along their career and growth path.

We conduct mid-year and annual performance reviews for all salaried employees to assess both job competencies and GrafTech's five core competencies. During annual performance reviews, we discuss progress towards personal career goals, refine career aspirations, and connect employees with specific pathways to achievement. Employees are encouraged to work with their manager or HR to further refine their career and growth paths at each annual review. In 2022, 100% of salaried employees received regular performance reviews.

In addition to reviews, employees have the opportunity to discuss their development with their manager through routine "Stay Discussions." In these conversations, employees can review their development goals and opportunities with their manager and determine how these goals can be incorporated into their work formally and their career paths more broadly.

ESG DATA

GRI STANDARD	DISCLOSURE	LOCATION
GRI: General Disclosures		
Organizational details	2-1	About This Report, GrafTech at a Glance
Entities included in the organization's sustainability reporting	2-2	About This Report
Reporting period, frequency and contact point	2-3	About This Report
Activities, value chain and other business relationships	2-6	About This Report
Employees	2-7	2022 Annual Report
Governance structure and composition	2-9	Corporate Governance, 2023 Proxy
Nomination and selection of the highest governance body	2-10	Corporate Governance, 2023 Proxy
Role of the highest governance body in overseeing the management of impacts	2-12	Sustainability at GrafTech, Corporate Governance
Delegation of Responsibility for managing impacts	2-13	Sustainability at GrafTech
Role of the highest governance body in sustainability reporting	2-14	About This Report
Conflicts of interest	2-15	Business Ethics

GRI STANDARD	DISCLOSURE	LOCATION
Evaluation of the performance of the highest governance body	2-18	Corporate Governance
Remuneration policies	2-19	ESG-Linked Compensation, 2022 Annual Report
Process to determine remuneration	2-20	Corporate Governance, Risk Oversight
Statement on sustainable development strategy	2-22	Sustainability at GrafTech
Policy Commitments	2-23	Business Ethics
Embedding policy commitments	2-24	Business Ethics
Processes to remediate negative impacts	2-25	Business Ethics
Mechanisms for seeking advice and raising concerns	2-26	Business Ethics
Approach to stakeholder engagement	2-29	Stakeholder Engagement
Collective bargaining agreements	2-30	2022 Annual Report
Materiality		
Process to determine material topics	3-1	Materiality
List of material topics	3-2	Materiality

METRIC	GRI/SASB[1]	2019	2020	2021	2022
Governance					
Regulatory Compliance					
Management of material topics	3-3		Governance; Corporate Governance		
Board Diversity					
Male		87%	77%	73%	78%
Female		13%	23%	27%	22%
White[2]					8
Hispanic and Latinx[2]					1
Age					
Under 30		0%	0%	0%	0%
30–62		67%	67%	64%	55%
63+		33%	33%	36%	45%
Number of confirmed incidents of corruption	205-3	0	0	0	0
Number of legal actions taken for anti-competitive behavior, anti-trust, and monopoly practices	206-1	0	0	0	0
Financial Key Measures (in Millons)					
Net Sales		1,791	1,224	1,346	1,281
Net Income		745	434	388	383
Adjusted EBDITA[3]		1,048	659	670	536

1   Global Reporting Initiative/Sustainability Accounting Standards Board.

2   GrafTech began collecting board demographics in 2022.

3   Non-GAAP financial measure; see page 33 of the enclosed Annual Report on Form 10-K for the year ended December 31, 2022 for information and a reconciliation of net income, the most directly comparable financial measure calculated and presented in accordance with GAAP, to adjusted EBITDA.

METRIC	GRI/SASB	2019	2020	2021	2022
Environment					
Climate					
Management of material topics	3-3				Climate and Energy
Total Scope 1 GHG Emissions (MTCO$_2$e)	305-1, Rt-CH-110a.1	190,847	143,759	178,626	156,987
CO$_2$ (MT)	305-1, Rt-CH-110a.1	188,881	143,309	178,333	156,744
CH$_4$ (MT)	305-1, Rt-CH-110a.1	6	3	4	4
N$_2$O (MT)	305-1, Rt-CH-110a.1	5	0	1	1
Scope 1 and 2 GHG Emissions Intensity (MTCO$_2$e/MT graphite)[4, 5]	305-4	2.26	1.94	2.06	1.81
Total Scope 2 GHG Emissions (Location-Based) (MTCO$_2$e)	305-2	242,958	168,379	188,740	157,580
Total Scope 1 and 2 GHG Emissions (MTCO$_2$e)[6]		433,805	312,138	367,366	314,567

4   GHG emission intensity is set with an operational boundary of the four graphite electrode manufacturing plants (Calais, France; Pamplona, Spain; Monterrey, Mexico; and St. Marys, Pennsylvania).

5   Scope 1 and 2 GHG emission intensity is measured as metric tons of CO$_2$e divided by the metric tons of graphite electrodes produced (production volume) in the reporting year. Production volume for 2019–2022 are as follows: 2019 = 177,000 metric tons; 2020 = 134,000 metric tons; 2021 = 165,000 metric tons; 2022 = 157,000 metric tons.

6   Scope 1 GHG emissions are direct emissions from on-site fuel combustion. Scope 1 emissions include our headquarters campus and manufacturing sites. The baking process has been identified as the primary driver for Scope 1 emissions. Scope 2 GHG emissions are indirect emissions resulting from the generation of electricity, heat, or steam purchased from a utility provider. Scope 2 emissions include headquarters campus, all manufacturing facilities, and sales offices. The graphitizing process has been identified as the primary driver for Scope 2 emissions. Both Scope 1 and 2 emissions are calculated using the GHG Protocol methodology.

METRIC	GRI/SASB	2019	2020	2021	2022
Energy					
Management of material topics	3-3				Climate and Energy
Total Direct Energy Consumption (GJ)	302-1	3,294,282	2,806,664	3,491,904	3,059,194
Natural Gas (GJ)	302-1	2,819,632	2,451,020	2,908,330	2,471,506
Gasoline (GJ)	302-1	593	739	1,858	1,926
Diesel (GJ)	302-1	27,517	18,257	32,817	32,423
Fuel Gas (GJ)	302-1	446,541	336,648	386,708	415,554
Total Indirect Energy Consumption (GJ)	302-1	2,863,031	2,274,741	2,701,240	2,730,233
Electricity (GJ)	302-1	2,862,733	2,274,444	2,700,943	2,729,935
Heating - Natural Gas (GJ)	302-1	297	297	297	297
Percentage of Grid Electricity	302-1, RT-CH-130a.1	96.0%	95.3%	94.8%	95.4%
Percentage of Renewable Energy	302-1, RT-CH-130a.1	0%	0%	0%	0%
Total Self-Generated Energy (GJ)	302-1, RT-CH-130a.1	155,955	142,704	181,105	162,874
Self-Generated Energy sold (GJ)	302-1, RT-CH-130a.1	37,657	30,949	32,972	30,052
Total Energy Consumption (GJ)	302-1, RT-CH-130a.1	6,157,313	5,081,405	6,193,144	5,789,427
Air Emissions					
Management of material topics	3-3				Air Emissions
NO$_X$ (MT)	305-7	411	317	485	387
SO$_X$ (MT)	305-7, RT-CH-120a.1	1,076	855	935	804
Particulate Matter (MT)	305-7, RT-CH-120a.1	275	176	203	153

METRIC	GRI/SASB	2019	2020	2021	2022
Water					
Management of material topics	3-3				Water
Total Water Withdrawal (ML)	303-3 (2018), RT-CH-140a.1	2,365	2,260	1,526	1,532
Municipal water (ML)	303-3 (2018)	985	922	664	863
Groundwater (ML)	303-3 (2018)	408	449	533	349
Surface water (ML)	303-3 (2018)	340	312	329	320
Recycled water (ML)	303-3 (2018)	631	577	569	649
Percentage in regions with high or extremely high baseline water stress[7]	RT-CH-140a.1	11%	11%	11%	11%
Number of incidents of non-compliance associated with water quality permits, standards, regulations	RT-CH-140a.2	0	0	0	0
Waste					
Management of material topics	3-3				Waste
Total Non-Hazardous Waste Generated (MT)	306-3 (2020)	22,602	20,304	14,941	12,904
Total Hazardous Waste Generated (MT)	306-3 (2020), RT-CH-150a.1	3,845	2,657	601	354
Environmental Compliance					
Notices of Violation for environmental non-compliance that resulted in significant fines or penalties	307-1	0	0	0	0

7 Monterrey, Mexico has been identified as a high water-stress area based on the World Resources Institute Aqueduct™ 3.0 water risk framework. Of GrafTech's operational footprint, 11% is located in regions with high or extremely high baseline water stress. Monterrey comprises the entirety of that percentage.

METRIC	GRI/SASB	2019	2020	2021	2022
Products					
Materials Sourcing					
Management of material topics	3-3				Materials Sourcing
Product Quality					
Management of material topics	3-3				Product Quality
Product Stewardship					
Management of material topics	3-3				Product Stewardship
Production					
Sales Volume (in thousands of metric tons)[8]		171	135	167	149
Production volume (in thousands of metric tons)[9]		177	134	165	157
Process Safety[10]					
Process Safety Incidents Count	RT-CH-540a.1	0	0	0	0
Process Safety Total Incident Rate	RT-CH-540a.1	0	0	0	0
Process Safety Incident Severity Rate	RT-CH-540a.1	0	0	0	0
Number of Transport Incidents	RT-CH-540a.2	0	0	0	0

8   Sales volume reflects only graphite electrodes manufactured by us.

9   Production volume reflects graphite electrodes we produced during the period.

10   Seadrift is the only PSM site within GrafTech.

METRIC	GRI/SASB	2019	2020	2021	2022
Human Rights[11]					
Percentage of operations assessed for human rights impacts	412-1	0	0	0	0
Percentage of employees trained on ethics and human rights policies and procedures	412-2	100%	100%	100%	100%
Innovation					
Management of material topics	3-3				Innovation
Total spend on R&D		$2,684,000	$3,975,000	$3,771,000	$3,641,000
Total spend on CAPEX projects		$64,103,000	$36,075,000	$58,257,000	$72,165,000
Customers					
Customer Service					
Management of material topics	3-3				Customer Service
Community					
Community Engagement					
Management of material topics	3-3				Community

11   Included in Code of Conduct training.

METRIC	GRI/SASB	2019	2020	2021	2022
WORKFORCE					
Workforce Diversity					
Management of material topics	3-3				Workforce Diversity
Occupational Health and Safety					
Management of material topics	3-3				Occupational Health and Safety
Total Recordable Incident Rate (employees)	403-9 (2018), RT-CH-320a.1	0.95	0.51	0.49	0.94
Lost Time Incident Rate (employees)	403-9 (2018)	0.51	0.36	0.42	0.5
Employee Fatalities	403-9 (2018)	0	0	0	0
Employee Fatality Rate	403-9 (2018), RT-CH-320a.1	0	0	0	0
Workforce Management					
Management of material topics	3-3				Workforce Management
Employee Demographics					
Total Employees		1,346	1,285	1,353	1,347
Male	102-8	1,191	1,142	1,220	1,201
Female	102-8	124	126	133	146
Americas	102-8	888	847	863	885
EMEA	102-8	420	415	483	455
APAC	102-8	7	6	7	7

METRIC	GRI/SASB	2019	2020	2021	2022
Senior Leadership					
Total Number		7	7	6	6
Male		86%	86%	67%	67%
Female		14%	14%	33%	33%
Age: Under 30		0	0	0	0
Age: 30–50		2	2	3	1
Age: 50+		5	5	3	5
Salaried Employees					
Total Number		469	476	486	532
Male		75%	75%	74%	74%
Female		25%	25%	26%	26%
Age: Under 30		9%	9%	9%	10%
Age: 30–50		58%	58%	59%	55%
Age: 50+		33%	33%	32%	35%
Hourly Employees					
Total Number		877	809	867	815
Male		99%	99%	99%	98%
Female		1%	1%	1%	2%
Age: Under 30		25%	19%	18%	17%
Age: 30–50		54%	57%	58%	59%
Age: 50+		21%	24%	24%	24%

METRIC	GRI/SASB	2019	2020	2021	2022
Collective Bargaining/Unions					
Percentage of Employees Covered by Collective Bargaining Agreements	102-41	58%	54%	41%	39%
Talent Attraction and Retention					
Management of material topics	3-3		Talent Attraction and Retention		
Training and Development					
Percentage of employees receiving regular performance reviews[12]	404-3	100%	100%	100%	100%
Percentage of employees trained on ethics and compliance policies and procedures[12]		100%	100%	100%	97%

12   Includes salaried employees.

GRAFTECH
International

GrafTech International Ltd.
982 Keynote Circle
Brooklyn Heights, Ohio 44131