Task Force on Climate-Related Financial Disclosures (TCFD) reporting

The Task Force on Climate-Related Financial Disclosures (TCFD) was established by the Financial Stability Board in 2015, and focused on improving the reliability of climate-related risks and opportunities.

We recognise climate change as both a risk and an opportunity for our business, and we fully support the implementation of the recommendations of the TCFD. Climate change poses challenges to our supply chain and production operations, as well as to our employees and customers.

Listing Rule 9.8.6R compliance statement

Morgan Advanced Materials is reporting in line with FCA Listing Rule 9.8.6R(8) by providing climate-related financial disclosures consistent with the TCFD recommendations in this report. We consider our climate-related financial disclosures to be consistent with eight of the recommendations, however we are adopting an 'explain' stance for the following three recommendations:

1. and 2. Strategy B and C – The impact of climate-related risks and opportunities on the organisation's businesses, strategy has been explained, however detailed financial plans to mitigate these are still being developed. Scenario analysis has been completed for most risks and opportunities. For reliance on natural gas we have only modelled the financial impact of GHG taxes. The financial impact of Heat Stress incident has not been included as we are working on methodologies to calculate this. It was considered that the potential risk in the short term would not be material and therefore scenarios were examined over the medium and long term time horizons. However we recognise the importance of scenario analysis in the development of our strategy and will enhance the detail and accuracy in future reporting cycles.

3. Metrics and targets B – Scope 3 screening data for the reporting year has been disclosed however, given the spend-based approach taken, this should be used for guidance purposes only until the full inventory is completed for the most material categories.

Although no formal strategy to achieve compliance has yet to be developed, each of these recommendations remains a key focus for ESG compliance.

The climate-related financial disclosures made by Morgan Advanced Materials comply with the requirements of the Companies Act 2006 as amended by the Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022.

Summary of disclosures:

Section	Requirement	Location
Governance	a) Describe the Board's oversight of climate-related risks and opportunities. b) Describe management's role in assessing and managing climate-related risks and opportunities.	page 44 page 45
Strategy	a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term. b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning. c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	pages 47 to 48 pages 46 to 49 page 47
Risk management	a) Describe the organisations processes for identifying and assessing climate-related risks. b) Describe the organisations processes for managing climate-related risks. c) Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organisations overall risk management.	page 50 page 50 page 50
Metrics and targets	a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management processes. b) Disclose scope 1, 2 and if appropriate, scope 3 GHG emissions and related risks. c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.	page 50 pages 50 to 51 pages 51 to 52

Governance

Morgan Advanced Materials' climate-related risk and opportunities governance starts at our highest level – the Board, and cascades down through the organisation, as outlined in the table on page 45.

Our Board has oversight of our climate change, environmental and corporate responsibility matters and ensures that our executive team progresses as planned to meet our commitments and goals.

The Board Chair and Board of Directors monitor the Group's progress against climate related actions at each meeting.

The metrics reviewed at each meeting include:

- Progress towards our 2030 absolute Scope 1 and & 2 CO_2e emissions target[1]
- Progress towards our 2030 water withdrawal and water stress targets[2].

The impact of capital expenditure projects on our 2030 environment goals is assessed as part of the Board review process.

Climate change risks and opportunities are considered as part of a top-down (from the Board) and a bottom-up (from the Global Business Units (GBUs) risk management process, where it is considered as a contributory factor within several risk categories, and as a risk itself. The severity of each risk is quantified by assessing its inherent impact and mitigated probability, to ensure that the residual risk exposure is understood and prioritised for control throughout the Group. Substantive impacts are assessed and monitored through our risk assessment process.[3]

1. See metrics and targets section.
2. See metrics and targets section.

Morgan Advanced Materials' climate governance structure

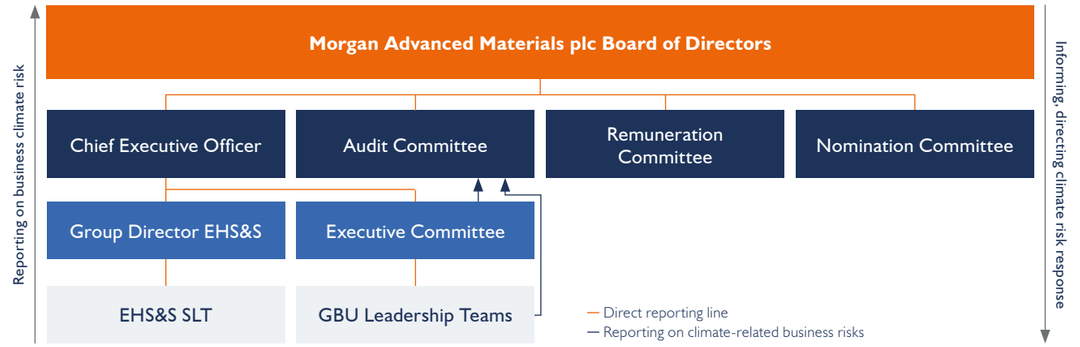


Table 1 – Board and Management oversight of climate-related risks and opportunities

Board of Directors	› Has oversight of our climate change, environmental and corporate responsibility matters to ensure our executive team progresses as planned to meet our commitments and goals. › Climate-related risks and opportunities are a scheduled Board agenda item twice per year and progress on environmental matters is reviewed four times per year, with updates on CO_2 and water progress in each meeting. › The competencies of the Board can be found on page 80 of the annual report, which included skills and experience relevant to climate matters.
Chief Executive Officer	› Has overall responsibility for climate risk management and delivery of the Sustainability strategy. › Environmental performance metrics, including CO_2 emissions and water usage, are reviewed each month with the GBU presidents as part of the monthly performance review cadence.
Nomination Committee	› Ensures the Board possesses the correct depth and balance of capabilities to support the Group's long-term position, including the expertise to assess the impact of climate change.
Audit Committee	› Supports the Board on matters relating to financial reporting, internal control and risk management. The Committee reviews the integrity of the Group's climate-related financial reporting and the process used to develop our TCFD-aligned disclosures and assesses climate-related risks for the purpose of monitoring management's progress in addressing them.
Remuneration Committee	› Responsible for remuneration policy, including the inclusion of sustainability-linked metrics and targets within performance-related pay. Greenhouse gas emissions targets are part of our Long-Term Incentive Plan (LTIP).[4]
Executive Committee	› Responsible for execution and monitoring of the sustainability strategy, including environmental and corporate responsibility matters, and the processes and controls regarding climate risks at a Group level. Includes GBU presidents.
Group Director, Environment Health, Safety and Sustainability (EHS&S)	› Reporting to the CEO, is responsible for developing further, and driving execution of, the ESG strategy. They manage and report progress on environment and sustainability matters to the executive team and to the Board of Directors. › Is a key part of the Group risk review process – which reviews current and emerging risks every six months and reports these to the executive team.
EHS&S Leadership Team	› Led by the Group Director EHS&S and comprising EHS&S leads from each of the GBUs, the team meets monthly to review strategy implementation and performance against 2030 targets.
GBU leadership teams	› Each GBU has a leadership team and they are responsible for sharing, reviewing and managing of both principal and emerging risks including climate risks. This includes related policy, guidelines and process, and is subject to Board oversight. › The GBUs develop business-specific risk registers and business continuity plans which are used in their annual strategic planning. These are presented to the Audit Committee and Executive Committees. › The individual GBUs monitor their own performance against ESG targets and implement climate-related policies and projects.

3. See Risk Management page 54.
4. See Directors Remuneration Report pages 104 to 130.

Task Force on Climate-Related Financial Disclosures (TCFD) reporting continued

Strategy

Identification of risks and opportunities

In late 2020, our Executive Committee, our Group Director EHS&S, and the CEO conducted a comprehensive materiality assessment to establish our ESG priorities up to 2030. We obtained feedback from our Board and surveyed over 160 senior business leaders to determine what ESG means to our organisation. Additionally, we gathered input from internal and external stakeholders and assessed our business performance. Based on this materiality information we identified our sustainability impacts on the environment and society as well as the risks and opportunities that were material to our business and set ambitious goals for the future. During 2023, scenario analysis was conducted on the identified material risks to better understand our business strategy and resilience. Having considered the all sector and sector specific risks and opportunities in Tables A1.1 and A1.2 in the TCFD guidance, the information in the table below summarises our material risks[7] and opportunities across the appropriate time horizons.[8]

Our products contribute to environmental sustainability by significantly improving the energy efficiency of our customers' operations. We provide products that enable solar and wind energy, as well as those that support efficient high-temperature processes such as ceramic and glass manufacturing, and industrial gas turbines.

Strategic execution priorities

1. Big positive difference
2. Delight the customer
3. Innovate to grow[9]

As part of our ongoing assessment of material risks and opportunities the previous year's disclosures have been reviewed to determine if they would continue to have a material impact on the Group.

Following this review and considering legislation timelines and requirements it was deemed that obligations for enhanced emissions reporting did not cause a material impact on the Group as any increased costs would be modest.

New product development was previously disclosed in isolation however this has now been included within the overall opportunity of expanding within our faster growing markets.

Availability of raw materials was previously included within this section. It is considered to be an operational risk due to certain single-point suppliers, and is therefore included within the Risk Management section on page 58.

Changing customer behaviours leading to reduced demand for our core markets is no longer considered to be material. The flexibility and adaptability of our product portfolio enables us to support the requirements of our customers net zero transitions, giving strong resilience against any such changes in core market demand.

Scenarios chosen

Transition scenarios were chosen to explore different potential approaches that governments and the international community could take when setting carbon prices, and how this could impact the Group in different regions. These were taken from World Energy Outlook 2022 – published by the International Energy Agency. The Net Zero Emissions (NZE) scenario was chosen to understand the effect on the business of rapid implementation, and the Announced Pledges Scenario (APS) was chosen to explore the current trajectory. Likelihood scores were assessed based on anticipated speed of adoption of these measures across the international community. In undertaking this analysis we have assumed future growth in line with our financial framework.

Physical scenarios were chosen to explore best (<2°C) , medium (2–4°C) and worst case (4°C) impacts from physical climate change at individual sites. These were modelled using different Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathways (RCPs).
For the physical risks, the likelihood of reaching each global temperature rise was considered. For example, it was considered to be almost certain that the world will experience a temperature rise of 1.5°C, whereas it is less likely that 4°C would be reached. This likelihood was then combined with the likelihood of an incident occurring at one of our sites to give a final result.

Table 2 – Summary of our material risks and opportunities

Risk/ opportunity & time horizon	How it impacts Morgan Advanced Materials	Link to our strategy/ associated opportunity	Scenario likelihood/ Impact	Comments and response	Related metrics and targets
Transition risks & opportunities					
Reliance on natural gas Medium to long term 1. Impact of rising wholesale costs and GHG pricing instruments. 2. New manufacturing technology to reduce natural gas use and lower carbon output. 3. Damage to reputation.	Natural gas is widely used across the Group especially in our high-temperature furnaces. 1. Continued reliance on natural gas increases the Group's financial exposure with increasing wholesale costs. 2. Transitioning to lower carbon manufacturing processes requires investment. In many cases, the technology is not yet available to enable either electrification or other low carbon fuels (such as green hydrogen). 3. The reputational impact from being a carbon intensive business may deter potential employees and third parties that want to work with the Company.	1, 2 and 3 Reducing the carbon footprint of key products will support our customers with their net zero ambitions. Investing in new and existing manufacturing processes to drive efficiency improvements will help mitigate financial exposure.	1.5°C[10] Likelihood 3 Impact 3 (medium term) <2°C[11] Likelihood 4 Impact 3 (medium term)	For reliance on natural gas the financial impact of GHG taxes was modelled, however rising wholesale prices has not been modelled as we have considered this within our strategic and financial planning which mitigates any significant risk. Our reputational damage has not been assessed. The results show an increasing likelihood and impact from reliance on natural gas across both scenarios. GHG pricing instruments will likely begin to come into force closer to 2030. Based on current guidance the majority of our sites produce CO_2 emissions at a level lower than the thresholds. In response, we will continue to leverage our core capability in materials science. A key part of our Transition Plan before 2030 is our investment in R&D for key product families to establish their decarbonisation pathway. The cross-GBU furnace working group is working to establish efficiency improvement and decarbonisation opportunities. As an example, we are signatories of the Ceramics UK Towards Net Zero initiative and are part of their Hydrogen research project. Our products help our customers to save energy. The impact from high fuel prices in recent years has been passed on to our customers and we would expect to pass on carbon costs in the same way, enabling our customers to choose the most carbon-efficient technology. Our pledge to increasingly source carbon-free energy demonstrates our commitment to decarbonisation.	Commitment to reduce scope 1 and 2 emissions by 50% by 2030 from a 2015 baseline. Commitment to source 80% carbon-free energy by 2025.
Growth in our faster growing markets Short-medium term	Increasing demand for semiconductors, healthcare, clean energy and clean transportation solutions to support the global net zero transition offers growth opportunity for the Group.	1, 2 and 3 These markets align well with both our purpose and strategy. Our products support the global transition to a more sustainable future.	Forecast 7–12% growth per year, through the cycle. These segments contribute 21% of total sales.	Increasing decarbonisation drivers will increase demand for our products. We are investing in capacity to better serve these growing markets and have dedicated market specialists to ensure we address their needs. In these markets, we have newer products with high levels of differentiation and we continue to invest in R&D to develop products which meet the needs of tomorrow.	Revenue and % growth in our faster growing markets. Investment in R&D.

7. Climate-related materiality impacts are aligned with our broader risk assessment criteria, which is defined using EBITA impact as follows:
   – 1 – Negligible financial impact (£0–£0.1 million) – The lowest level are those risks where the Company can absorb the financial impact, and the reputational impact is relatively non-existent or negligible.
   – 2 – Low financial impact (£0.1–£1 million), with a potential to be known by the public via regulatory notices.
   – 3 – Moderate financial impact (£1–£5 million), with the potential to be known by the public or to damage our Company reputation.
   – 4 – High financial impact (£5–£10 million), with the potential to impact customer confidence.
   – 5 – Significant financial impact (£10–£20 million) and/or reputational damage.
   – 6 – Critical financial impact (>£20 million) and/or reputational damage.
   Likelihood assessments are aligned with our broader risk assessment criteria, and reflects the likelihood of the scenario and incident occurrence, where the risk probability is defined as follows:
   – 1 – Rare 0–5%
   – 2 – Low 5–10%
   – 3 – Moderate 15–25%
   – 4 – High 25–50%
   – 5 – Significant 50–75%
   – 6 – Inevitable >75%.
8. Climate-related risks and opportunities could impact the Group strategy over the short, medium and long term. These are aligned with our broader risk assessment criteria and are defined as follows:
   – Short term (0–3 years). Detailed financial plans are developed, incorporating the strategic spending requirements to decarbonise our business and realise growth opportunities.
   – Medium term (3–10 years). Aligns with our 2030 ESG targets. Each GBU develops transition plans within this time horizon to realise these targets.
   – Long term (10–25 years). Aligns with our 2050 ESG ambitions. In this time horizon we expect to see a significant shift in technologies to allow us to decarbonise our business but realise that significant uncertainties exist and must be considered when developing long-term transition plans.
9. For more detail on our execution priorities see page 19.
10. Net Zero Emissions (NZE) scenario from World Energy Outlook 2022 – International Energy Agency.
11. Announces Pledges Scenario (APS) from World Energy Outlook 2022 – International Energy Agency.

Task Force on Climate-Related Financial Disclosures (TCFD) reporting continued

Risk/ opportunity & time horizon	How it impacts Morgan Advanced Materials	Link to our strategy/ associated opportunity	Scenario likelihood/ Impact	Comments and response	Related metrics and targets
Physical risks & opportunities					
Heat stress Medium term	Heat stress at our manufacturing facilities could negatively affect our staff, plant and materials.	1 The health and safety of our employees is our top priority. Supporting them delivers on our big positive difference strategic priority.	<2°C[12] Likelihood 3 2–4°C[13] Likelihood 4 >4°C[14] Likelihood 3	Extreme heat events become more likely and impactful in the worst-case scenario. Mitigations such as the strategic provision of air-conditioned rest rooms for workers, which are already widely available across our sites, are relatively straightforward to implement to protect employee health whilst minimising GHG growth. Our global manufacturing footprint and diversified supply chain means products could be temporarily manufactured at other facilities in the event of business disruption. During periods of high heat that have already occurred at some manufacturing locations, we have been able to shift manufacturing to cooler times of day. The potential impacts from heat stress are considered as part of our ongoing manufacturing strategy.	We are now monitoring heat stress incidents through our H&S reporting system. A 0.10 LTA rate. Top quartile engagement score.
Water stress Medium term	Water is used in the manufacture of our materials. Drought events where process water is limited could impact our sites.	3 Innovating to reduce the process water used in our manufacturing processes reduces both the cost of the water and the energy required to dry the product.	<2°C[7] Likelihood 3 Impact 1 2–4°C[8] Likelihood 4 Impact 1 >4°C[9] Likelihood 3 Impact 2	Drought events increase in duration in the worst-case scenario. Drought events of greater than one month were considered in our modelling. As a key part of our Transition Plan before 2030 we are investing in R&D for key product families to reduce water use and share best practice in water conservation. The water stress at a location is evaluated as part of our ongoing manufacturing strategy. The three sites affected in the <2C scenario already have mitigation plans to reduce consumption. In Aurangabad, India we have introduced a water harvesting system, in Kizad, UAE a new recirculating water tower was installed. In Gujarat, India we are evaluating the installation of a recirculating cooling tower. By reducing our consumption in these locations we mitigate the possibility of being forced to reduce operations.	30% reduction in water withdrawal by 2030 from a 2015 baseline. 30% reduction in water withdrawal at water-stressed sites by 2030 from a 2015 baseline.
Sea level rise Medium to long term	Some of our factories are in low-lying locations. Although sea level rise in isolation is not predicted to affect these locations, when combined with high tide and storm surges, flood events could damage our plants and interrupt supply of product to customers.	2 Our global manufacturing footprint means products could be manufactured at other facilities, supporting our customers through any interruptions.	<2°C[15] Likelihood 3 Impact 3 2–4°C Likelihood 4 Impact 3 >4°C Likelihood 3 Impact 3	The impact from seal level rise on our facilities was found to be moderate with flood damage and potential protection or relocation costs the key impact. We undertook an analysis of our exposure to sea level rise in 2022. Of our 70 manufacturing locations, four were identified as having >1% annual risk of flooding before 2050. This is a long-term risk and it is being actively considered as part of the ongoing review of our physical portfolio. One of the identified high-risk sites from the last report (Dalian, China), closed in the course of 2023.	Ongoing monitoring, metrics not developed.

12. RCP 4.5 – IPCC.
13. RCP 4.5 (High) – IPCC.
14. RCP 8.5 – IPCC.
15. Climate central coastal risk screening tool – based on IPCC RCPs.

Impact of risks and opportunities on the business strategy

The first transition risk explored was the Company's reliance on natural gas in the manufacturing process. Although only one of our sites is currently exposed to an emissions trading scheme, there is risk in the future that more of our operations will be exposed to carbon pricing instruments as well as the rising wholesale cost of natural gas. Assuming annual growth in emissions linked to business growth, both the 1.5°C and <2°C scenarios predicted a similar impact in 2030, but increasingly diverged in 2040 and 2050, with higher impact in the 2°C scenario. The impact shows the potential costs to the Company of not being proactive in planning for decarbonisation and enacting our decarbonisation roadmap.

Our customers, exposure to carbon pricing mechanisms could also be an opportunity. Our products help our customers to become more efficient, by reducing losses in their manufacturing operations or in the operation of their product. For example, our thermal management solutions are supporting our customers to maximise throughput efficiency and minimise their carbon footprints.

We have significant transition opportunity in our faster growing market segments of semiconductors, healthcare, clean energy and clean transportation. A number of projections have been compiled using external sources and internal analysis which show a through-cycle CAGR of 7–12% in the next three to five years. Given the relatively short time horizon we have not run scenario analysis on these growth rates.

Heat stress and water stress scenario analysis examined potential changes in peak temperatures and drought months at 25 of our largest sites. Sea level rise risk was assessed for sites with >1% chance of flooding before 2050. Impact scorings were based on potential temporary interruptions to manufacturing operations. Changing physical risks are being actively considered as part of the ongoing review of our physical portfolio.

Business resilience

The resilience of the Group to these climate risks has been assessed. Our global footprint, strong market positions and diverse portfolio is our strength. Our customer base is widely spread. We largely make products where we sell them with localised supply chains. In the event of a local shock, manufacturing of product could be transferred to other sites within the GBU.

Our scenario analysis around our natural gas reliance allows us to plan for changes in operating costs and balance our global manufacturing strategy. Our financial performance over recent years has demonstrated our resilience, growing profitably every year. Even during the shock of the global pandemic in 2020 we maintained operating margins above 10%.

Transition Plan

The risks and opportunities considered by the Board have directly informed the Group's strategy to deliver on our 2030 goals and 2050 aspirations. These form the foundation of our net zero roadmap, as set out below, to ensure we achieve our targets.

Preparing for the future

The Company's short-term planning (0–3 years) focuses on climate change-related actions towards process efficiency, improving net-water consumption, and changing electricity providers to carbon-free sources to achieve our 2025 target of 80% carbon-free electricity:

- **Conversion of lower temperature furnaces to electricity**. Building on the development work to convert low temperature processes, minimising exposure to carbon taxation
- **Development of a scope 3 emissions strategy and targets**. In 2023 we further refined our scope 3 screening exercise in line with SBTi guidance. In 2024 we will commence work on our scope 3 inventory, starting with the most material categories. From this we will develop strategies to reduce emissions across the categories which are key to the Group
- **Life cycle assessment on our key products**. To better support our customers in their decarbonisation journeys, we will conduct life cycle assessment on our key products, making carbon footprints available, but also identifying opportunities to reduce their impact
- **Engineering solutions to increase efficiency and water recycling**. In particular, leveraging our furnace working group to ensure our existing assets are performing
- **Inclusion of a shadow carbon price in Capex business cases**. This will drive visibility of the potential environmental costs of business decisions
- **Investing in early stage R&D projects for carbon-free furnaces**. Acknowledging that the solutions are not yet deployable in many cases, we will work with academia, industry groups and suppliers to develop solutions
- **Investing to grow capacity in key markets**. We will invest in equipment to support the fast growth in the semiconductor, clean energy and clean transportation markets, embedding and improving our market position.

Scaling up

The Company's medium-term planning (3–10 years) delivers more permanent solutions to achieve our 2030 ESG goals:

- **Installation of pilot carbon-free furnaces**. Higher temperature processes require more technology development, and the installation of pilot furnaces for the different furnace types will support this
- **Further conversion of lower temperature furnaces to electricity**. Converting further low temperature furnaces to electricity
- **Working with our value chain to reduce scope 3 emissions**. Deploying our strategy to reduce our scope 3 footprint in key categories to achieve our target of 15% reduction by 2030.

Investment in key technologies

The Company's long-term approach (10–25 years) considers the achievement of long-term goals and implementing the solutions needed to decarbonise our business. Climate change-related long-term planning includes decisions on the future of power generation and supply, advancements in low carbon technology and larger investments in waste heat recovery and carbon capture:

- **Further conversion of lower temperature furnaces to electricity**. Converting remaining low temperature furnaces that can be converted to electricity
- **Conversion of higher temperature furnaces to electricity**. Where technologically possible, converting higher temperature furnaces to electricity

Task Force on Climate-Related Financial Disclosures (TCFD) reporting continued

- **Working with our value chain to further reduce our scope 3 emissions**. Building on our progress, we will continue to work with our value chain to decarbonise
- **Conversion of remaining furnaces to carbon-free alternatives**. Electrification may not be possible or viable in all cases, so parallel R&D paths will develop and deploy alternative solutions.

Risk management

The Board recognises the need to understand and assess climate-related risk and the inherent uncertainty therein. Risk management and internal control are fundamental to achieving the Group aim of delivering long-term sustainable growth in shareholder value.

Principal and emerging risks are identified both 'top-down' by the Board and the Executive Committee and 'bottom-up' through the Group's global business units. Senior executives including the CEO and Executive Committee are responsible for the management of the Group's principal risks, including climate-related risk. Further details on the Company's procedures for identifying, assessing and managing risk can be found on page 54, in the Risk Management section of our Annual Report.

Our Environment, Health, Safety & Sustainability Senior Leadership Team (EHS&S SLT) meets monthly to oversee management of our most significant environmental and climate risks. This group is chaired by our Group Director EHS&S.

The senior management teams for the different GBUs are responsible for developing risk mitigation and management strategies for the risks they identified for their individual businesses. Each risk is assessed by using the indicators of relevance and their associated impact as part of their annual strategic planning. Impact on revenue, litigation outcomes, sites disrupted and applicable fines are all quantifiable indicators that could affect each sites, risk classification.

Climate change and environmental remediation are recorded as two principal risks on the Group risk register. Climate change covers transition and physical term risks listed on pages 47 to 48 in the Strategy section of this report. Environmental remediation covers the risk of environmental incidents and risks to remediation activities underway in parts of the Group. These are assessed in the same way as all of the other principal risks. Climate risk is also considered as a component of other principal risks.

During 2023, the Board reviewed the preparedness of the Company to the principal risks with a significant potential impact at Group level every six months. Additionally, the Audit Committee carried out a focused risk review of each GBU. These reviews included an analysis of the principal risks, and the controls, monitoring and assurance processes established to mitigate those risks to acceptable levels. The overall risk from climate change was assessed to have a high severity rating.

Metrics and targets

We are pleased that our 2030 targets have been scrutinised and validated by the Science Based Targets initiative (SBTi) as being aligned with the well below 2°C trajectory. Our commitments are as follows:

- Morgan Advanced Materials commits to reduce absolute scope 1 and 2 GHG emissions 50% by 2030 from a 2015 base year[16]
- Morgan Advanced Materials also commits to increase active annual sourcing of carbon-free electricity from 0% in 2015 to 80% in 2025 and 100% by 2030
- Morgan Advanced Materials further commits to reduce absolute scope 3 GHG emissions 15% by 2030 from a 2019 base year.

We engaged ERM CVS to obtain limited assurance in relation to selected information and data in this Report. The Assurance Report can be found on our website[17]. Morgan Advanced Materials outlines its organisational boundary on an operational control basis, and our scope 1 and 2 emissions are reported on this basis.

The Company has reviewed the cross-industry climate-related metrics Table A2.1 from the TCFD guidance and has developed metrics for GHG emissions. Although ESG targets are part of the Executive Management Team's LTIP (see pages 104 to 130), we do not intend to develop metrics in this area.

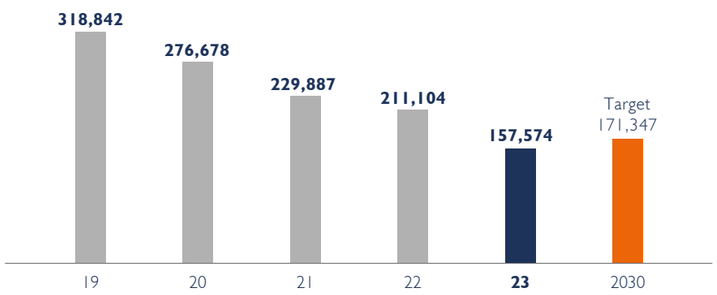
Scope 1 and 2

We monitor our scope 1 and 2 emissions to understand our natural gas consumption, and potential exposure to carbon pricing mechanisms. It also allows us to understand and track how mitigating actions such as increasing efficiency and new technologies are impacting and reducing our exposure.

Scope 1 and 2 emissions reduction performance

Morgan Advanced Materials has reduced its scope 1 and 2 emissions by 54% from a 2015 baseline. This has been achieved through the increased procurement of carbon-free energy and driving energy efficiency within our operations. Our manufacturing sites account for 99% of our scope 1 and 2 emissions so improving the efficiency of these in the short term is key to reducing our scope 1 CO_2e emissions. Although we have surpassed the target for 2030 continued focus on efficiencies and technology advancements is needed to maintain this. In the medium term our furnace working group will evaluate and pilot alternative fuel furnace technology in line with our Transition Plan.

CO_2e scope 1 and 2 emissions (metric tonnes)



16. The target boundary includes biogenic land-related emissions and removals from bioenergy feedstocks.
17. The assurance statement is available on our website: morganadvancedmaterials.com/en-gb/being-responsible/sustainability-responsibility-report/

Carbon-free energy procurement target

We monitor our carbon-free energy procurement as it is part of our strategy to reach our 2030 scope 1 and 2 reduction target. This in turn mitigates our exposure to carbon pricing mechanisms.

As part of our commitment to the SBTi, one of our validated targets is to increase our sourcing of renewable and carbon-free electricity from 1% in 2019 to 80% by December 2025, and we commit towards sourcing 100% renewable and carbon-free electricity by 2030.

Table 3 – carbon-free energy progress

Metric	2019	2020	2021	2022	2023	2025 Target
Carbon-free energy procurement as a % of total electricity procured	1%	6%	33%	49%	72%	80%

Our strategy is based on reducing our scope 2 emissions through the purchase of carbon-free electricity.[20] In 2023 we procured 72% of our electricity from green or carbon-free sources. We continue to evaluate the procurement options for renewable energy on a regional basis, including options for on-site generation. During the course of 2023, three additional solar PV systems were commissioned at our sites, with further plans for investment. In total in 2023 we generated 1.5 GWh renewable electricity on-site, an increase from 1.2 GWh in 2022.

Scope 3

We recognise assessment of our value-chain emissions is an important part of our long-term sustainability strategy. In 2022, we completed a scope 3 screening exercise[21] across all relevant categories as part of our SBTi submission. The figures for 2023 and our 2019 baseline[22] are shown below.

The screening exercise uses both spend-based and volume-based methods to estimate emissions in each of the categories. In the future we intend to review the emissions factors used for the existing data and to transition away from spend-based factors in the most material categories.

Table 4 – Scope 3 emissions screening results

Morgan Advanced Materials scope 3 GHG emissions results (tCO_2e)		**2023**	2022	2021	2020	2019
Category 1	Purchased goods and services	**410,641**	474,257	439,775	394,744	444,705
Category 2	Capital goods	**100,351**	75,768	49,794	42,816	76,684
Category 3	Fuel and energy related activities	**31,567**	30,497	52,118	61,163	70,647
Category 4	Upstream Transport	**46,613**	71,143	58,777	48,935	65,109
Category 5	Waste generated in operations	**9,597**	12,344	11,889	11,210	15,968
Category 6	Business travel	**13,903**	9,360	5,509	3,953	20,036
Category 7	Employee commuting	**12,750**	12,750	12,750	12,750	12,750
Category 8	Upstream leased assets	**–**	–	–	–	–
Category 9	Downstream transport	**22,705**	18,780	18,052	15,912	17,228
Category 10	Processing of sold products	**26,995**	30,361	28,116	28,477	30,340
Category 11	Use of sold products	**53,146**	49,843	43,389	39,837	43,205
Category 12	End of life of sold products	**81,107**	57,050	58,062	53,725	56,427
Category 13	Downstream leased assets	**–**	–	–	–	–
Category 14	Franchises	**–**	–	–	–	–
Category 15	Investments	**–**	–	–	–	–
	Total scope 3 GHG emissions (tCO_2e)	**809,375**	**842,153**	**778,231**	**713,522**	**853,099**
	Total scope 1 and 2 GHG emissions (tCO_2e)	**157,574**	211,104	229,887	276,678	318,842
	Total GHG emissions (tCO_2e)	**966,949**	**1,053,257**	**1,008,118**	**990,200**	**1,171,941**

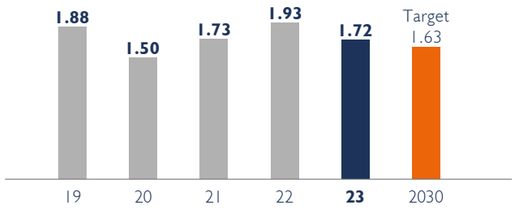
20. Carbon-free electricity includes renewable and nuclear sources.
21. Scope 3 values were estimated using volume-based data where available and spend-based where not. Emission factors used are from the GHG evaluator tool with the exceptions of categories 10, 11 and 12 which were estimated using life cycle assessment insights for key products.
22. Our 2019 results have been updated from figures published in the 2022 TCFD disclosure following an improvement in the upstream and downstream transport calculation to introduce estimates for supplier and customer transport not procured by Morgan Advanced Materials.

Task Force on Climate-Related Financial Disclosures (TCFD) reporting continued

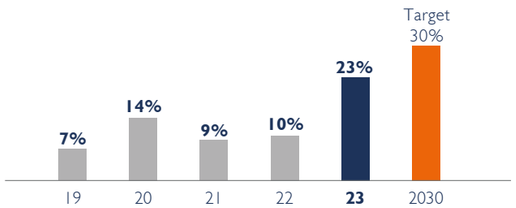
Total water withdrawal and withdrawal in water-stressed regions

Our aspiration is to use water sustainably across our business. Our 2030 target is to reduce our overall water withdrawal by 30% and reduce our water withdrawal in high-stress areas by 30% (from a 2015 baseline).[23] In line with the most recent data, we have updated our water-stressed definition to include China[24] and our 2015 baseline has been restated. We monitor our water withdrawal in water stressed regions to ensure that we are taking action at those sites to minimise water consumption. This mitigates against the risk of business interruptions in case of a drought event. We have reduced our total water withdrawal by 26%, and by 23% in water-stressed areas compared to this baseline. In 2023, due to the cumulative effect of a number of water saving investments, and an impactful water leak in 2022, our total water withdrawal had decreased by 11% compared to the prior year. Withdrawal in water-stressed areas is also improved, due to the impact of water reduction projects.

Total water withdrawal (million m^3)



Water withdrawal in water-stressed areas* (% reduction from 2015 baseline)



* Water-stressed areas include Spain, Italy, Turkey, Mexico, India, United Arab Emirates, Argentina, Australia and the state of California, USA. Using the most recent WRI data, 2023 and prior years have been restated to include China. See page 38 for details.

Our Stourport facility in the UK has made strategic investments in water recirculation systems, particularly this one in the materials manufacturing section. In 2023 alone, their efforts have reduced site water consumption by a commendable 43%, demonstrating their commitment to minimising their environmental footprint while maximising operational effectiveness.

Revenue in faster growing markets and R&D spend

Growth in our faster growing markets of semiconductors, healthcare, clean energy and clean transportation is a transition opportunity for the Group. In 2023 we recognised sales of £237.3 million in these sectors, increasing from £217.7 million in 2022. We monitor our revenue in faster growing markets to ensure we are accessing the climate related opportunities in these markets. In addition, in 2023 we invested £32.9 million in R&D, increasing from £31.6 million in 2022. R&D investment is key to mitigating the technology transition risk, as we move away from fossil fuel powered furnaces.

Heat stress monitoring, Lost time accident rate and employee engagement

We are now monitoring heat stress incidents through our H&S reporting system. This allows us to understand the impact that heat stress is having on our employees, and allows us to take action to reduce their exposure. In 2023 we saw one LTA attributable to heat stress and a further six incidents where the employee was able to return to work. In 2023 we improved our LTA rate to 0.19[25] as we continue to work towards our 2030 goal of a LTA rate of 0.10. In 2023 we achieved an engagement score of 54%.[26]

23. Water withdrawal includes water drawn from the Company's owned sources, local authority and commercial sources.
24. Morgan Advanced Materials identifies water-stressed sites using the 'Aqueduct Projected Water Stress Country Rankings' (https://www.wri.org/data/aqueduct-projected-water-stress-country-rankings). We determine our water-stressed sites by referring to the list of countries categorised into high (40–80% | score 3–4) and extremely high (>80% | score 4–5) water stress levels. We utilise the 2030 business-as-usual scenario for industrial water usage to classify sites in water-stressed areas. Previous reports used the 2020 database. For 2023 reporting, we have used the 2022 database and have restated historical figures accordingly. Additionally, our sites in the State of California, USA are included in our water stress figures, due to the water stress issues in the state of California. Countries classified as water-stressed are Australia, China, India, Italy, Mexico, Spain, Turkey, UAE and USA – California.
25. See page 40.
26. See page 39.

Streamlined energy and carbon report

This report summarises our energy usage, associated emissions, energy efficiency actions and energy performance under the government policy Streamlined Energy and Carbon Reporting (SECR). This is implemented by the Companies (Directors' Report) and Limited Liability Partnerships (Energy and Carbon Report) Regulations 2018. Also, it summarises in the appendix, the methodologies utilised for all calculations related to the elements reported under energy and carbon.

Morgan Advanced Materials PLC is a UK incorporated business and is also a main-market listed company. Under SECR legislation we are mandated to include energy consumption, emissions, intensity metrics and all energy efficiency improvements implemented in our most recent financial year, for our UK operations. An operational boundary has been applied for the purposes of the reporting.

Specific examples of actions taken within the year to reduce energy consumption include:

- Investment in on-site solar energy. Our site in Swansea completed the installation of a 278kW solar array, bringing their installed capacity to over 500kW, with other installations completed at our Kailong, China plants
- Replacement of a gas furnace with an electric furnace at our Kempten site in Germany
- Use of thermographic analysis to improve the efficiency of furnaces in Kizad, UAE
- Installation of transparent roof panels to improve the quality of light at our facility in Chile.

Table 5 – Scope 1 and 2 Emissions and Streamlined Energy and Carbon Reporting

1 January – 31 December 2023	Units	2023	2022	2021	2020	2015
Scope 1 energy consumption	MWh	**574,531**	636,583	648,833	592,325	
UK	MWh	**38,316**	37,988	37,358	36,277	
Global excluding UK	MWh	**536,215**	598,595	611,475	556,048	
Scope 1 GHG emissions[27]	tCO_2e	**110,563**	121,989	122,817	116,552	205,570
UK	tCO_2e	**7,374**	5,657	6,880	6,686	
Global excluding UK	tCO_2e	**103,189**	116,332	115,937	109,866	
Scope 2 energy Consumption	MWh	**395,366**	423,955	417,835	387,177	
UK	MWh	**14,198**	15,205	15,083	15,673	
Global excluding UK	MWh	**381,168**	408,750	402,752	371,504	
Scope 2 GHG emissions (market-based)[28]	tCO_2e	**47,011**	89,115	107,070	160,126	137,124
UK	tCO_2e	**0**	0	0	3,657	
Global excluding UK	tCO_2e	**47,011**	89,115	107,070	156,469	
GHG intensity	tCO_2e/£m	**141**	190	242	304	391
UK	tCO_2e/£m	**169**	106	179	276	
Global excluding UK	tCO_2e/£m	**140**	194	245	305	
Biogenic CO_2 emissions[29]	tCO_2e	**719**	978	877	501	1,368

Methodology

This report (including the scope 1 and 2 consumption and CO_2e emissions data) have been developed and calculated using the GHG Protocol – A Corporate Accounting and Reporting Standard (World Business Council for Sustainable Development and World Resources Institute, 2004); Greenhouse Gas Protocol – Scope 2 Guidance (World Resources Institute, 2015); Environmental Reporting Guidelines: Including Streamlined Energy and Carbon Reporting Guidance (HM Government, 2019).

Scope 1 calculations use the UK Government GHG Conversion Factors for Company Reporting (2023 version). Scope 2 location-based calculations use emission factors from the IEA 2023 publication, Scope 2 market-based calculations follow the GHG Protocol emission factor hierarchy and apply supplier-specific factors and residual factors, where available. All consumption data was complete for the reporting period.

We are committed to a sustainable future and our approach to sustainability continues to evolve as we bring into scope more and more elements related to our operations, processes and products.

Our products are benefiting the environment by making the operations of our customers significantly more energy efficient, and over the last five years we have made steady reductions to our own CO_2e emissions and water consumption.

27. Total scope 1 emissions were calculated from the addition of emissions from fuels, refrigerants and other process emissions. Biogenic CO_2e emissions are calculated and reported separately in Table 3. Process emissions disclosed (4,617 tCO_2e, or circa 4% of scope 1 emissions in 2023) are calculated using internally derived calculations. Scope 1 emissions for 2020 to 2022 have been restated from prior years to include process emissions. The scope 1 figure excludes mobile emissions which were estimated to be circa 200 tCO_2e in 2023 but could not be evidenced for assurance purposes.
28. The scope 2 emissions figure was calculated using the market-based methodology. The location-based figure for the same period is 155,957 tCO_2e.
29. Biogenic emissions result from the combustion of biological materials. These are considered carbon neutral and therefore reported separately. Emissions were calculated using the UK Government GHG Conversions Factors for Company Reporting (2023 version).