
2022 Sustainability Report

Foreword

Our purpose is to use advanced materials to make the world more sustainable and to improve the quality of life. We deliver on that purpose through the products that we make, and how we make them.

Our products help our customers to be more efficient – to use less energy in their manufacturing process or in their product, and to generate less CO₂. We are working hard to decarbonise our own operations also – to produce our products more efficiently and to reduce our own CO₂ emissions.

- We have continued to migrate to carbon-free electricity across the Group with 49% of our power carbon free by the end of the year. We are continuing to improve the efficiency of our gas fired kilns and have started to evaluate electrically fired options for some kiln types. During the year we reduced our absolute scope 1 and 2 CO_{2e} emissions by 8.2%.
- Our overall water usage increased by 11.6% during the year driven by volume increases, changes in mix to more water-intensive products and processes and some significant water leaks. A number of process and infrastructure improvements were completed during the year and we expect to see this reflected in our water usage in 2023. Our water usage in stressed areas decreased by 0.7%, showing the impact of improvement projects in our plants in high water stress areas.
- Our LTA rate was 0.28 (2021: 0.22), a worsening of our accident performance, in part reflecting a larger number of new employees in the business as we ramped volumes up. We are not satisfied with this and we are working hard to improve. We have abroad programme of work underway across the Group to improve our safety position and performance. During the year we deployed our 'thinkSAFE' training in all of our plants. We increased the robustness of plant-level activities including start of shift briefings, safety tours, near miss identification and reporting and 5S (Sort, Straighten, Shine, Standardise and Sustain) and we put greater focus on cross-group learnings through safety shares and quarterly focus topics. Safety is our top priority and continues to receive a high level of focus throughout the organisation.



Pete Raby
CEO

We are proud of the contribution Morgan is making to creating a more sustainable world.

Our path to 2030

In March 2021, we set stretching targets to improve our performance and become a more sustainable business. As a result, we are investing in our manufacturing processes and technology to reduce the environmental impact of our business.

We are also investing in new materials and process technologies to improve the performance of our products, and to deliver greater environmental and safety benefits to our customers.

ESG commitments

PROTECT THE ENVIRONMENT



6 CLEAN WATER AND SANITATION


12 RESPONSIBLE CONSUMPTION AND PRODUCTION


13 CLIMATE ACTION


Our aspiration

- A CO₂e net zero business by 2050¹
- Use water sustainably across our business

¹ Excludes indirect emissions generated by our supply chain, distribution network and employee travel

Our 2030 goals²

- 30% reduction in water use in high and extremely high stress areas
- 30% reduction in total water usage
- 50% reduction in direct CO₂e emissions (scope 1 & scope 2)

² Reduction targets shown are compared to a 2015 baseline

PROVIDE A SAFE, FAIR AND INCLUSIVE WORKPLACE



3 GOOD HEALTH AND WELL-BEING


5 GENDER EQUALITY


8 DECENT WORK AND ECONOMIC GROWTH


Our aspiration

- Zero harm to our employees
- A workforce reflective of the communities in which we operate
- A welcoming and inclusive environment where employees can grow and thrive

Our 2030 goals

- 0.10 lost time accident rate (per 100,000 hours worked)
- 40% of our leadership population will be female
- Top quartile engagement score



Progress against our goals

Key environmental, social and governance (ESG) measures

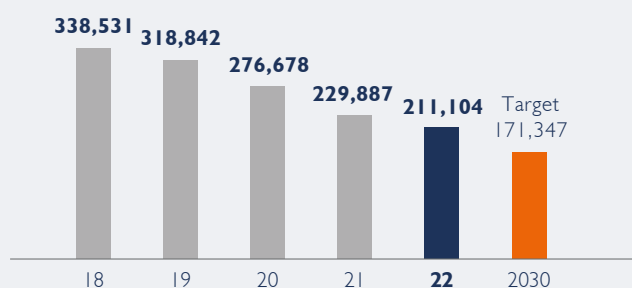
CO₂e scope 1 and 2 emissions (metric tonnes)

Alignment to strategy

1 2 3

Why do we measure this KPI?

Our sustainability agenda includes actions to reduce greenhouse gas (GHG) emissions and combat climate change. In March 2021, we announced a commitment to reduce absolute GHG emissions (scope 1 and 2) by 50% (against 2015 levels) by 2030.



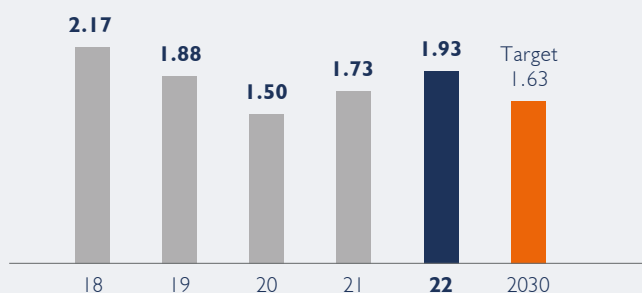
Overall water withdrawal (million m³)

Alignment to strategy

1 2 3

Why do we measure this KPI?

By 2030, we will reduce our total withdrawal of water by 30% (against our 2015 baseline), and we are implementing water sustainability projects globally to achieve this goal.



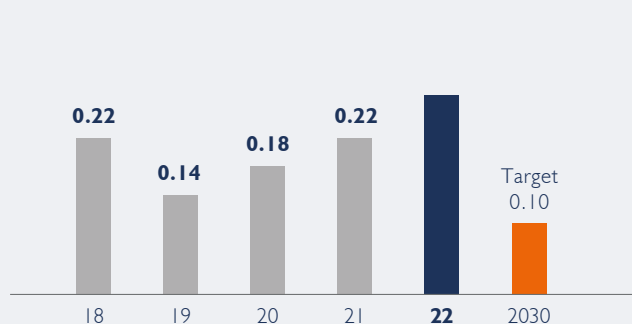
Lost-time accident (LTA) rate*

Alignment to strategy

1 2 3

Why do we measure this KPI?

We are working towards our aspiration of zero harm to all our employees. We are committed to conducting all our activities in a manner that builds a caring safety culture and develops a world-class safety system that supports this effort.



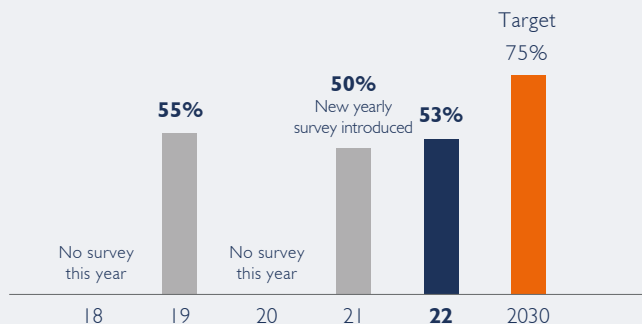
Employee engagement rate

Alignment to strategy

1 2 3

Why do we measure this KPI?

We measure the engagement of our people through an all-employee engagement survey called 'Your Voice'. As a result of the survey we build a tailored engagement plan to tackle the key issues across our sites, businesses and the Group.



* A lost-time accident (LTA) is defined as an accident or work-related illness which results in one or more days of lost time. Calculated as total number of lost-time accidents in the year, multiplied by 100,000 hours worked, divided by total number of hours worked.

Progress against our goals continued

Water withdrawal in stressed areas*

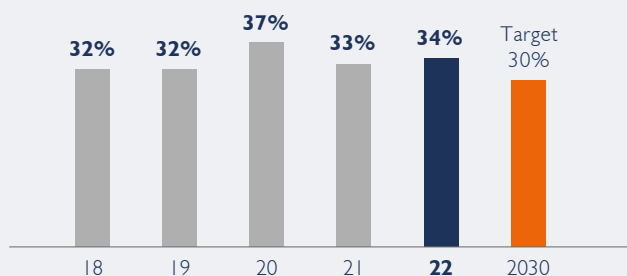
(% reduction from 2015 baseline)

Alignment to strategy

1 2 3

Why do we measure this KPI?

We recognise that in some instances our water demands are in areas of increasing water stress. Approximately 21% of our manufacturing operations are in these water stress areas. Our goal is to maintain a 30% reduction despite year-on-year business growth. By improving our water use in these areas, we will positively impact the local communities in which we operate.



* Water stressed areas include Spain, Italy, Turkey, Mexico, India, United Arab Emirates, Argentina, Australia, and the state of California, USA.

2021 and prior years have been restated to include the manufacturing site at Casalpusterleno, Italy.

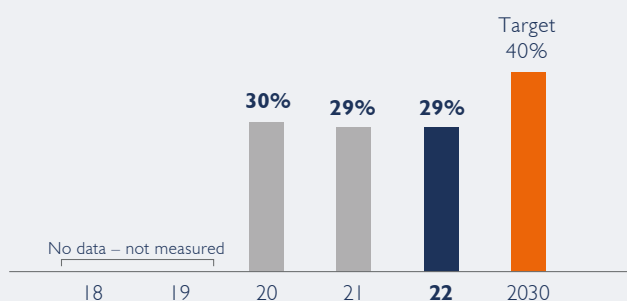
Female representation in leadership*

Alignment to strategy

1 2 3

Why do we measure this KPI?

A greater gender diversity just makes sense – it is good for Morgan and good for employees. We are continuing to take action to achieve a more balanced proportion of women in senior positions.



* Includes Executive w/o CEO/CFO plus 2nd to 4th tier.



Alignment to strategy

To deliver our strategy and to achieve our ESG goals we align our efforts to our three execution priorities.

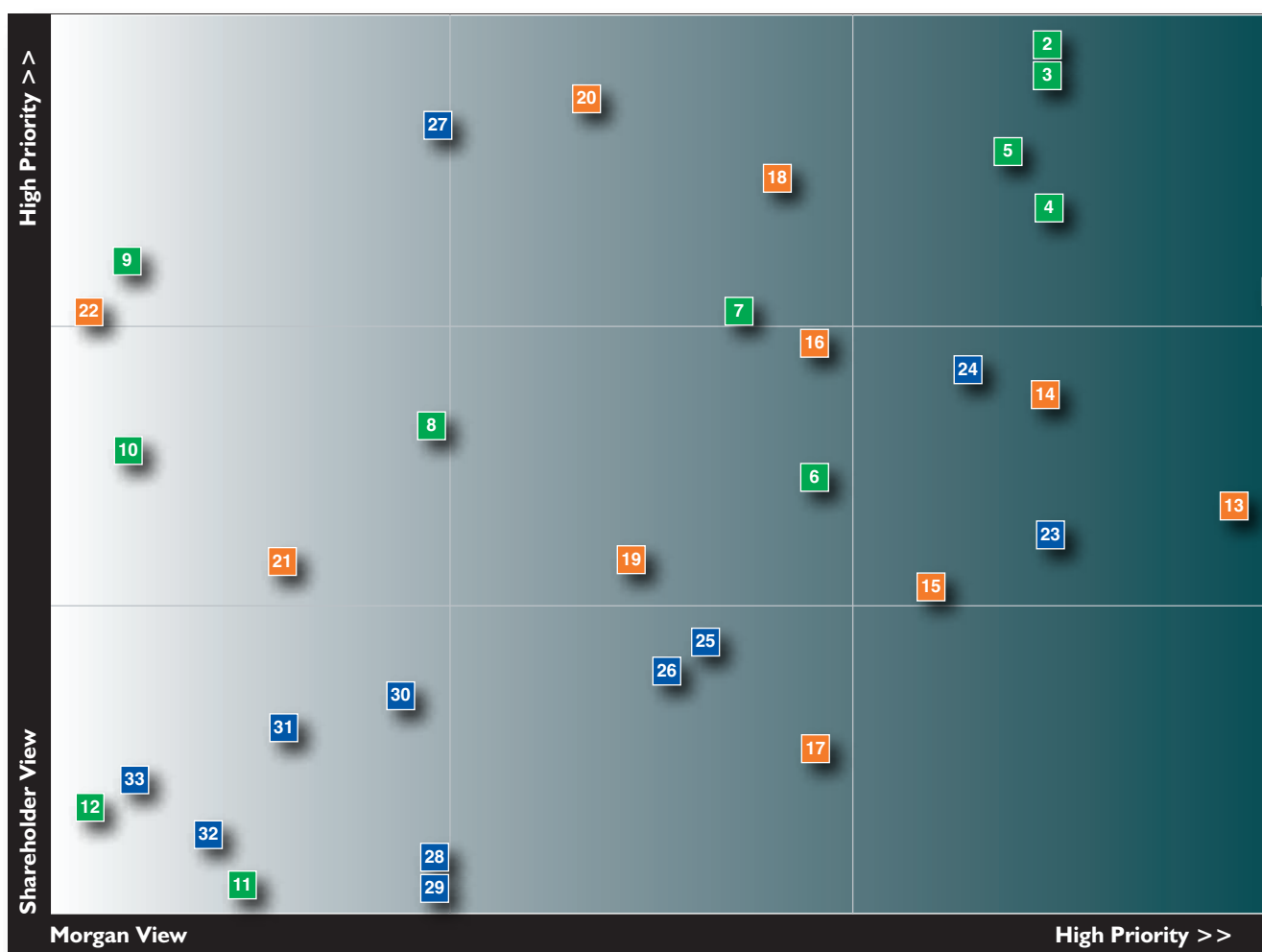
- 1 Big positive difference
- 2 Delight the customer
- 3 Innovate to grow

For further details please refer to the Morgan Advanced Materials 2022 Annual Report.

Materiality assessment and matrix

In 2022 the materiality assessment was used as part of our climate risk and opportunity analysis. It informs our strategic response and resilience as described in our TCFD Report.

In 2021 we refined our previous materiality assessment from 2020, to identify the ESG topics that impact our business and that are of interest to our external stakeholders. We utilised a third-party platform, as part of the assessment, to obtain input from 160 of our senior leaders and combined this with publicly available external data. This data included insights from investors, information from direct competitors, data from the engineering sector, and from global industrial sources. These findings are reflected in the materiality matrix below. This refreshed materiality assessment represents a snapshot in time aligned with our 2021 reporting boundaries. We share our perspectives on these important issues throughout this report.



Potential impact according to Morgan's Senior Leaders and Executive Team

Environment

- 1 Water & wastewater management
- 2 GHG emissions
- 3 Climate change risks & management
- 4 Transition to renewables & alternative energies
- 5 Energy management
- 6 Sourcing efficiency & management
- 7 Waste & hazardous waste management
- 8 Product design & lifecycle management
- 9 Air emissions
- 10 Natural capital
- 11 Management of local impacts
- 12 Ecological impacts

Social

- 13 Workforce management
- 14 Employee diversity & inclusion
- 15 Community relations
- 16 Human rights
- 17 Labor practices
- 18 Employee Health & Safety
- 19 Physical & sociopolitical risks
- 20 Public health risks
- 21 Access & affordability
- 22 Customer privacy & data security

Governance

- 23 Governance structures & mechanisms
- 24 Ethical corporate behaviour
- 25 Business model resilience
- 26 Transparency
- 27 Product & service safety & quality
- 28 Competitive behaviour
- 29 Selling practices & product labelling
- 30 Innovation & technology
- 31 Customer practices
- 32 Responsible consumption & production
- 33 Management of legal & regulatory environment

Environment

At Morgan we are committed to a sustainable future. Our aim is to ensure that our products and manufacturing processes are designed, built and managed in a way that enhances their value to society and our environment.

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 CO₂e emissions and water consumption.

Energy

Our sustainability strategy includes actions to reduce greenhouse gas (GHG) emissions and combat climate change. As public concern grows, more customers are asking about our GHG emissions as part of the manufacturing process. The increasing demand for low-carbon products and processes, and the need to consider the effects of climate change in general, have had an impact on our long-term strategy.

Morgan's GHG emissions are predominantly generated by the combustion of fossil fuels at various stages of our manufacturing processes. We are pleased to report that our absolute GHG emissions for scope 1 and 2 are down by 8.2% compared to end of year 2021. This correlates to a 38% reduction compared to our 2015 baseline.

Our progress in 2022

Scope 1 and 2 CO₂e emissions reduced by 8.2% in 2022 (compared with 2021).

Driven by improvements in:

- Green energy procurement: transition to renewable and other carbon free energy sources
- Efficiency & process optimisation actions: changes to processes (e.g., kiln firing profiles) and equipment operating protocols e.g., equipment shutdowns and idling machines
- Capital projects: replacement of inefficient assets, transition from gas to electric fuel types, and improvement in control systems

We have a broad-based improvement programme underway covering energy procurement, process improvements and behavioural changes in our plants. In 2022, we improved our energy intensity, price adjusted, by around 2% and continued the transition to carbon free energy for a number of our sites. Around half of our electricity now comes from green or carbon free sources.

Ranipet Decarbonisation

In 2022, our Thermal Ceramics site in Ranipet, India invested significantly in electric ovens to replace the fossil fuel powered ones at site. Best practice sharing revealed that electric continuous ovens used in other parts of the Group were performing more efficiently.

The team sourced and installed a replacement that uses electricity rather than fuel oil, and uses 40% less energy per kilogram of product manufactured (0.41 to 0.25 kWh/kg).

In addition a new electrical batch oven was designed and installed, replacing a fossil fuel powered oven. This uses 28% less energy per kilogram of product manufactured. Based on this success, four more electrical driers were horizontally deployed. This now means that all ovens and furnaces in Ranipet (which makes fibre and converted fibre products) are powered by electricity and therefore protected from the transition risk of carbon taxation.

Ranipet already had a solar array on site, generating 100,000kWh of green energy annually (around 1% of the site consumption). During 2022, a much larger 4MWp system was installed, which will generate approximately 5.6 million kWh of green energy annually, supporting 50% of the site's annual consumption.

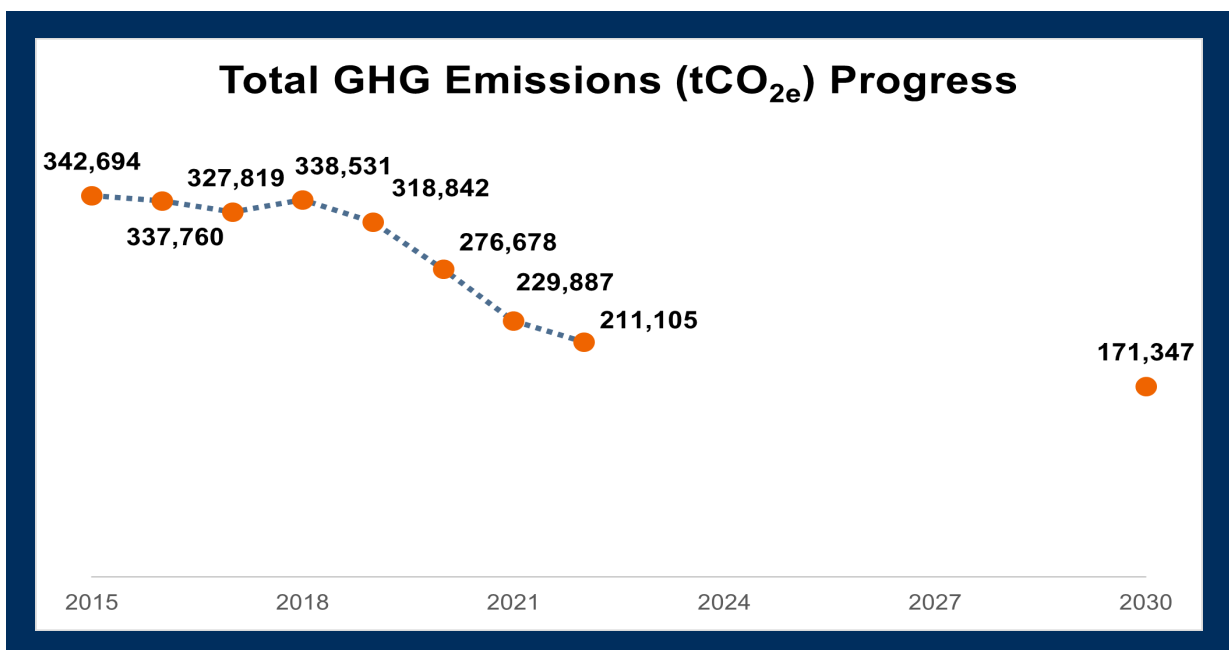
These projects combined are expected to reduce the overall CO₂e of the site by nearly 50%. The remaining emissions are 97% scope 2 – which is driven by the high grid factor in India and would be addressed with further procurement of green energy. The remaining scope 1 emissions are mainly fuels used for back-up generators.

These successful projects demonstrate a pathway to net zero and are replicable at other Morgan sites globally. They serve as templates for other sites as we electrify our lower temperature thermal processes in line with our decarbonisation roadmap.

Energy continued

Energy performance in 2022

- Total GHG emissions (tCO₂e) were 211,104 tonnes; 8% decrease over 2021 levels and 38% decrease over 2015 values.
- Scope 1 GHG emissions (tCO₂e) from stationary fuel combustion were 117,473 tonnes and scope 1 GHG emissions (tCO₂e) from process emissions were 4,516 tonnes. For 2022, total scope 1 GHG emissions (tCO₂e) accounted was 121,889 tonnes, which is a 1% decrease over 2021 values and 41% decrease over 2015 values
- Market-based scope 2 GHG emissions (tCO₂e) were 89,115 tonnes, which is a 17% decrease over 2021 values and 35% decrease over 2015 values.
- Achieved a "B" management score for Climate Change from CDP recognising we are taking coordinated action on climate issues.



Scope 1 includes "direct emissions," which come from sources owned or controlled by the company, e.g. the stationary combustion fuel sources at each site to generate heat or energy. Total scope 1 GHG emissions include process emissions disclosure based on refrigerant and process materials usage within operations. For 2022, process emissions were 4,516 tonnes out of 121,889 tonnes of total Scope 1 GHG emissions (tCO₂e). Note, process emissions disclosed in 2022 rely on historical kgCO₂e emission factors for process material used that could not be evidenced for assurance purposes. Currently, the scope 1 excludes unquantified process emission sources, minor fuel sources and fuel used within Morgan owned vehicles. From 2023, we plan to integrate all fuel sources including mobile combustion sources which are part of our operations (e.g. Morgan owned vehicles) and add granularity towards process emissions management.

Scope 2 encompasses "indirect emissions" (the result of company activities occurring at sources owned or controlled by another company) associated with the production of purchased electricity. Scope 2 emissions physically occur at the facility where electricity is generated. For the Morgan Group scope 2 GHG emissions reported using market-based GHG emission methodology. In terms of a few limitations towards scope 2 market-based calculations, we encountered a few challenges*. Our location-based scope 2 GHG emissions were calculated as 161,235 tCO₂e. We aim to undertake a detailed GHG inventory exercise in 2023, in case any deviations observed as per the GHG protocol calculation methodology, we plan to restate the GHG emissions in our 2023 reporting cycle.

* In terms of calculation of market-based GHG emissions we observed a delayed purchase of green energy credits towards the German sites, due to change in market prices; hence during calculation assurance we didn't have all 100% green credits. Going forward we will ensure all the Morgan group locations have necessary certification obtained before the sustainability reporting disclosure deadline. Also, we noticed a grid mix calculation approach for our Kizad site in the UAE towards green energy allocations, and we couldn't obtain appropriate proofs from the local agency towards the green energy allocation before reporting disclosure period. We will ensure the right green energy allocation will be done for the site level calculations, in accordance with the GHG protocol. While undertaking the GHG Inventory exercise in 2023, we aim to review and update our current GHG emissions calculation methodology in accordance with the GHG protocol and other disclosure standards. Based on these outcomes, if required we will restate our GHG emissions and green energy consumption in 2023.

Energy continued

Energy Procurement

In 2022, we have focused on driving our sustainability agenda further into our organisation. We understand that engaging with and inspiring our people to create local initiatives will better enable us to reach our goals. We are proud of the contribution the Morgan Group is making and the contribution of our people to creating a more sustainable world. For us, sustainability is fundamental to our purpose and our strategy.

The total energy consumption (fuel and electricity) for Morgan was 1,058 GWh for 2022, which is 1% lower than 2021 (1,067 GWh). In 2022, we reached the milestone of 49% green (renewable and carbon free) electricity¹. We plan to increase this further in the coming years, with a target of 65% renewable or carbon free electricity by the end of 2025.

	Units	2022	2021	2020	2019	2018
Total Energy (fuel + electricity) ²	GWh	1,058	1,067	994	1,134	1,180
Standard Grid Electricity	GWh	217	278	366	430	455
Green – Renewable & Carbon Free Electricity	GWh	205	140	22	5	5
% Green – Renewable & Carbon Free Electricity in total electricity consumption	%	49	33	6	1	1

1. For Morgan Advanced Materials, Green Electricity (kWh) is calculated based on the addition of renewable electricity consumption (purchased or generated) and carbon free electricity consumption (nuclear power source). The purchased renewable electricity includes direct renewable energy from the grid, renewable energy certificates (RECs), energy credits, etc. and in terms of renewable energy generation; we use electricity from in-house solar plant installations.
2. Note, total energy sources exclude a few minor fuel usage and fuel usage within the Morgan owned vehicles.

Scope 3 emissions

Morgan Advanced Materials acknowledges the importance of assessing our value-chain emissions in achieving our long-term sustainability objectives. We plan to collaborate with our key stakeholders and top-tier suppliers to reduce indirect emissions, which is our initial move towards minimising the impact of our product lifecycle.

Regarding GHG reporting, Morgan defines its organisational boundary on an operational control basis, and we report our scope 1 and 2 emissions on this basis. This implies that we account for 100% of such emissions resulting from operations over which Morgan or one of its subsidiaries has operational control. Generally, the term scope 3 refers to indirect GHG emissions originating from activities in our value chain, such as upstream emissions linked to raw materials, downstream emissions generated from the products we sell, and emissions from transportation activities upstream and downstream. The scope 3 standard further classifies these emissions into fifteen distinct categories.

In 2022, we utilized the GHG scope 3 evaluator tool to perform a scope 3 screening exercise across all categories. Our scope 3 emissions in 2021 were approximately 700,000 tCO₂e. The breakdown across various categories from 2019 to 2021 can be found in the table on the next page.

Our objective is to complete a comprehensive scope 3 inventory exercise and create data collection schemes with specific targets in 2023.

Oven Modernisation

In our St Mary's plant, we are undertaking a phased project to upgrade 18 ovens in the impregnation department. The new ovens are at least 30% more efficient due to the improved insulation packages, with the added safety benefit of having lower external shell temperatures. The increased uptime and lower maintenance costs add to the efficiency savings.



Energy continued

Morgan Group Scope 3 Screening GHG Emissions Results (tCO₂e)

		2019	% 2019	2020	% 2020	2021	% 2021
Category 1	Purchased goods and services	444,705	58%	394,744	62%	439,775	63%
Category 2	Capital goods	76,684	10%	42,816	7%	49,794	7%
Category 3	Fuel & Energy related activities	70,647	9%	61,163	10%	52,118	7%
Category 4	Upstream transport	26,143	3%	19,935	3%	23,949	3%
Category 5	Waste generated in operations	15,968	2%	11,210	2%	11,889	2%
Category 6	Business travel	20,036	3%	3,953	1%	5,509	1%
Category 7	Employee commuting	12,750	2%	12,750	2%	12,750	2%
Category 8	Upstream leased assets	Not considered relevant					
Category 9	Downstream transport	5,885	1%	4,379	1%	5,259	1%
Category 10	Processing of sold products	Not yet assessed					
Category 11	Use of sold products	40,000	5%	35,000	5%	37,500	5%
Category 12	End of life of sold products	56,427	7%	53,725	8%	58,062	8%
Category 13	Downstream leased assets	Not considered relevant					

The Group Director EHS&S chairs our procurement committee, which is instrumental in compiling the inventory and creating our scope 3 mapping. As anticipated, the screening process has revealed that most of our scope 3 emissions fall within category 1, which is purchased goods and services.

In 2022, a cross-functional committee was established, comprising members from EHS&S, procurement, ethics, and compliance, to design an ESG questionnaire that was distributed to our top suppliers to obtain their feedback and gauge their progress in ESG. This committee also collaborates with our top-tier suppliers to ensure compliance with our Supplier Code of Conduct and track their sustainability commitments. In 2023, we intend to offer ESG training to our top-tier suppliers to ensure they understand our objectives and how we can collaborate to achieve them. Completion rates for training will be monitored and reviewed with each supplier individually.

	2019	2020	2021
Total Scope 3 GHG Emissions (tCO ₂ e)	769,245	639,675	696,605
% of total GHG emissions	71%	70%	75%
Total Scope 1 GHG Emissions (tCO ₂ e)	137,578	116,552	122,817
% of total GHG emissions	13%	13%	13%
Total Scope 2 GHG Emissions (tCO ₂ e)	181,264	160,126	107,070
% of total GHG emissions	17%	17%	12%
Total GHG Emissions (tCO ₂ e)	1,088,087	916,353	926,492

As part of our SBTi submission, our scope 3 target is to reduce absolute emissions of tCO₂e by 15% by December 2030 from a 2019 base year.



Energy continued

Our decarbonisation roadmap

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

Preparing for the Future

Morgan's short-term planning (0-3 years) focuses on climate change-related actions towards process efficiency, improving net-water consumption, and changing power providers and/or power sources to renewable/carbon free energy to achieve our 2025 target of 65% 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 will complete a scope 3 inventory as part of our SBTi commitment. From this we will develop strategies to reduce these across the categories which are key to Morgan
- **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 & water recycling.** 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

Morgan's medium-term planning (3-10 years) delivers more permanent solutions to achieve our 2030 ESG goals.

- **Installation of strategic pilot carbon free furnaces.** Higher temperature processes require more development, the installation of pilot furnaces for the different furnace types will support this.
- **Further conversion of lower temperature furnaces to electricity.** Finishing the remaining low temperature furnaces that can be converted 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.

Investment in key technologies

Morgan'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.

- **Conversion of higher temperature furnaces to electricity.** Where technologically possible, converting higher temperature furnaces to electricity.
- **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.

Furnace Working Group

In 2021, we formed a cross-GBU furnace working group. This group compiled a centralised database of all the furnaces across Morgan, sharing information on furnace construction, fuel and performance in 2022. This has resulted in a searchable database which served as the basis for our transition scenario analysis on the effect of carbon taxation on our business, and more latterly as the starting point for our decarbonisation roadmap.

Of the 721 furnaces evaluated, more than half (62%, 447 furnaces) are already fuelled by electricity, so these will decarbonise in line with our carbon-free energy procurement strategy by 2030.

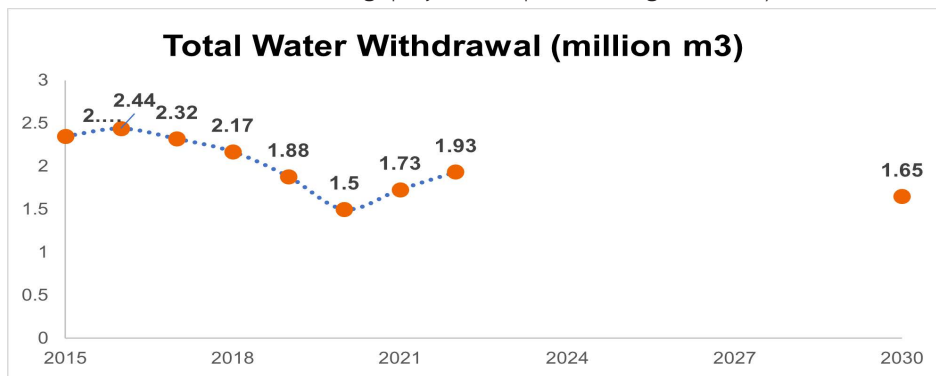
Of the remaining 264 furnaces, 195 have identified, currently available carbon free alternative technologies that could be implemented. A further 38 could likely be transitioned with significant development work, leaving only 31 without a currently available carbon-free alternative technology.

Water

Water is a precious resource and we're committed to using water effectively in our production processes and across our sites. Water scarcity is an increasing challenge in many parts of the world. As the world tackles climate change, our bio-energy demands will exacerbate water demand, meaning many will face water scarcity due to both physical shortages and scarcity in access. We use water in a number of our manufacturing processes, and we recognise that in some instances our water demands are in areas of increasing water stress. By improving our water usage we will positively impact the local communities in which we operate, and therefore society more generally.

Water is used both for production operations and sanitary purposes in our facilities. Our aim is to utilise water sustainably throughout our business. By 2030, we intend to reduce our overall water consumption by 30% and decrease water usage in high-stress areas by 30% (compared to a 2015 baseline).

Compared to our baseline, we have successfully decreased our total water withdrawal by 17%, and by 34% in water-stressed areas. However, due to the resumption of normal activity levels following the COVID-19 pandemic, our total water withdrawal increased in 2021. In 2022, we experienced an increase in water withdrawal due to heightened production demand and an isolated incident at one of our sites, resulting in a significant water leak. This occurrence contributed to an additional 112,000 m³ of water withdrawal. Excluding this incident, our annual withdrawal would have improved by an additional 5% over 2015 levels. We expect to observe a decrease in the total water withdrawal number in 2023 as the water savings projects completed during the 2022 year show full effect.



1. Water withdrawal on-site, within the calendar year, includes water sourced from mains/local authority/government/public supply, water extracted from a Morgan owned well/ borehole and water received from rainwater harvesting.
2. Calculated on constant-currency revenue basis, updated to reflect clarifications and changes in reporting methodology to ensure year-on-year consistency.
3. Water discharge includes water releases outside site boundary to river, pond, lake, unpaved/natural sewer, sea, land, etc. and includes water releases to local regulated sewer/drain, government pipeline, tanker etc
4. Net Water Consumption is calculated by the difference between water withdrawn and water discharged. This includes water consumption towards manufacturing processes, irrigation and sanitary use.

Total Morgan Group	2015	2020	2021	2022
Water Withdrawal (million m3) ¹	2.34	1.50	1.73	1.93
% Reduction from 2015	-	-36%	-26%	-17%
Water Withdrawal Intensity (m3/£m) ²	-	1,646	1,821	1,739
Water Discharge (million m3) ³	1.26	0.92	1.21	1.28
Net Water Consumption (million m3) ⁴	1.08	0.57	0.51	0.65
Net Water Consumption Intensity (m3/£m) ²	-	609	514	587

Aurangabad Water Harvesting

Our site in Aurangabad, India sits in a water stressed area. To reduce the water use of the site, in 2022, a 500 m³ water harvesting system was built and commissioned to capture and store rainwater during the monsoon season. The system is expected to reduce the water consumption of the site by 6,750 m³, about 23% of the site's total water use

The facility was inaugurated by Pete Raby, CEO, Morgan Advanced Materials, and Aniruddha Karve, Managing Director Molten Metal Systems on 10 November 2022.

Water continued

2022 progress and performance

- Total water withdrawal is 1.93 million m³; which is a 12% increase over 2021 levels and 18% decrease over 2015. The negative trend towards water withdrawal is due to increase in production demand and a few major water leak incidents across the business.
- Water withdrawal intensity is measured at 1,739 m³/£m GBP, compared to 1,821 m³/£m GBP of 2021
- Total water withdrawal in high water-stressed areas is 1% lower than 2021 and 34% decrease over 2015.
- Achieved a “B” management score for Water Security from CDP, recognising we are taking coordinated action on water issues.

Water stressed areas

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. For 2021 and 2022 water stressed areas identification, we used country rankings based on 2020 database of 'Aqueduct Projected Water Stress Country Rankings'. For 2022 the list of water-stressed sites included Spain, Italy, Turkey, Mexico, India, UAE, Argentina, and Australia. Additionally, the Morgan sites in the State of California (USA) are included in Morgan's water stress figures, based on water stress issues within the California state.

Based on the 2022 published database from 'Aqueduct Projected Water Stress Country Rankings' the Morgan sites will be revised for the 2023 ESG reporting cycle. The revised water stress areas include Spain, Italy, Turkey, Mexico, India, UAE, China, Australia, CA-USA. This change will be reflected in the 2023 ESG reporting cycle (Jan-Dec 2023) and we will restate our water stress numbers accordingly.

We concentrate more on water-stressed area sites within Morgan to identify areas for water saving, CAPEX allocation, and water withdrawal reduction targets.

Water Stressed Sites	2015	2020	2021	2022
Water Withdrawal in water stressed areas (m ³)	237,277	150,509	158,727	157,597
% w.r.t. Total Morgan Group Water withdrawal	10%	10%	9%	8%
% Reduction from 2015	-	-37%	-33%	-34%
Water Discharge in water stressed areas (m ³)	66,715	31,937	41,852	28,370
% w.r.t. Total Morgan Group	5%	3%	3%	2%
Net Water Consumption water stressed areas (m ³)	170,562	118,572	116,875	129,227

What's next?

Morgan Advanced Materials is committed to investing in CAPEX projects aimed at achieving water savings across our global sites. These water-saving initiatives will include various methods, such as rainwater harvesting and wastewater recycling. In addition, we have started a programme to detect and reduce water leaks at our production sites, as part of our efforts to address the water losses identified in 2022.

Waste and recycling

Every year, we aim to decrease waste intensity by 5% and increase recycling efforts by the same percentage compared to the previous year. We achieve this through Kaizen and 6S (Sort, Set in order, Shine, Standardise, Sustain and Safety) activities, which focus on eliminating waste, improving quality, increasing efficiency, reducing idle time, and minimising unnecessary activities.

In 2022, we improved waste generation at several sites by enhancing waste segregation and streamlining waste by category. This enabled each site to better understand its waste streams and identify opportunities for improvement. Our year-on-year progress in each category are shown in the following tables.

	Unit	2022	2021	2020	2019	2018
Total Waste Generated	(metric tons)	47,879	39,918	35,660	48,676	46,605
Waste Generation Intensity	(metric tons/£m)	43	42	39	46	45

	Unit	2022	2021	2020	2019	2018
Total Waste Recycled	(metric tons)	25,406	21,547	18,214	27,833	25,943
% Recycling of total waste	%	53	54	51	57	56

All the EHS&S KPIs were calculated with reference to Morgan's EHS&S Basis of Reporting (BoR) and EHS definitions documents. These documents are available for review upon request.

Biodiversity

Investors and funding agencies now recognise biodiversity loss as a significant risk, and are beginning to request that organisations monitor, report, and mitigate their biodiversity risks. As a result, the manufacturing sector is aligning itself to understand its impact on biodiversity and is taking measures to mitigate the impact.

Biodiversity at Morgan

Morgan Advanced Materials values the protection of biological diversity as a means of preserving natural resources and flora and fauna survival. We understand the interdependence of our raw material usage, freshwater consumption, and waste generation on the natural ecosystem. Our 2030 ESG objectives are consistent with the Sustainable Development Goals (SDGs), particularly SDG 6 (Clean Water & Sanitation), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action). Our EHS&S policy and our corporate sustainability goals, such as those related to product manufacturing, circular economy, water management, material consumption, GHG reduction, and climate protection, are aimed at mitigating the risks to biodiversity.

Biodiversity strategy

Our focus moving forward will centre on three key areas of impact: responsible production at our manufacturing sites, the effects of our products on the ecosystem, and our supply chain. As part of our ESG strategy, we intend to conduct assessments to determine the impact on ecosystems and dependencies within Morgan's manufacturing value chain. Additionally, we will initiate a study to identify activities occurring in both protected areas and high biodiversity value areas outside of protected areas. This will enable us to understand and mitigate potential biodiversity risks.

Augusta Environmental Control System

Our Augusta facility, located in Georgia, USA, has installed a new environmental control system that aims to greatly decrease the emissions of sulphur dioxide and particulate matter generated by our on-site processes. These emissions can have an adverse effect on the local flora and fauna.

Our project team worked closely with the local authorities to ensure the successful implementation of this large-scale installation, with a goal of reducing sulphur dioxide emissions by 50%.

The project was a resounding success, achieving a remarkable 90% reduction in emissions. This accomplishment is a testament to Morgan's unwavering dedication to improving air quality and biodiversity in the communities surrounding our facilities.

Safety

The safety strategies we have put in place are guided by our Environmental, Health, Safety and Sustainability (EHSS) Policy, and are aimed at achieving zero accidents and injuries at our facilities. Our EHSS policy, is endorsed by our CEO and applies to all Morgan employees globally and forms the basis of our approach. These strategies include:

- Improving our safety culture by implementing the thinkSAFE programme
- Ensuring competence in all health and safety matters through training and education at all levels of the organisation
- Proactively eliminating and controlling health risks within the workplace to prevent employees being made ill or their health condition made worse by their work
- Establishing minimum safety standards for all Morgan assets and activities which and where appropriate exceed legislation wherever we operate in the world.

By 2030, we aim to accomplish the following objectives:

- First, we aspire to prevent any occurrence of injuries or illnesses by promoting a culture of care. Our approach involves designing equipment and processes that eliminate or control potential risks. In situations where engineering solutions are not feasible, we continually assess and implement standards to safeguard people from hazards.
- Second, we prioritise the elimination of risks that could result in serious injury. We aim to eradicate all cases of employee and contractor injuries and occupational illnesses not only at work but encourage the same best practices at home.

To achieve our ambitious safety objective of zero accidents and injuries, the involvement of every individual affiliated with Morgan - employees, contractors, and visitors - is crucial. Our employees play a pivotal role in influencing health and safety processes and protocols by providing valuable input through various channels, such as safety teams and committees, site communication meetings, pre-shift meetings, and training sessions. Morgan proactively identifies and mitigates hazards through a corrective/preventive action process. Our approach to health and safety employs several tools, such as machine-specific risk assessments, 'TAKE 5' assessments, root-cause incident investigations, permit to work processes, and Don't Walk By Hazard (DWB) and Good Practice Reporting.

2022 H&S performance

	Unit	2022	2021	2020	2019	2018
Fatalities	Number	0	0	0	0	0
Lost Time Accidents (LTAs) ¹	Number	53	37	29	27	42
Lost Time Accidents Rate (LTA rate) ²	Number	0.28	0.22	0.18	0.14	0.22

1. A lost time accident (LTA) is defined as an accident or work-related illness which results in one or more days of lost time.

2. LTA rate Calculated as total number of lost-time accidents in the year, multiplied by 100,000 hours worked, divided by total number of hours worked. For Lost Time Accident (LTA) rate calculation, the total resource working hours are derived from addition of employee working hours and agent/contract worker waged hours. We acknowledge a few limitations in terms of the standard methodology for total resource working hours calculation/reporting; however, we are currently in-process to finalise standard calculation/reporting methodology and policy at the Morgan group level.

While Morgan has maintained a long-standing commitment to safety, we acknowledge that there is still progress to be made as we strive to meet our 2030 targets. In 2022, we achieved a lost time accident rate¹ of 0.28, an improvement of 38% against our 2015 baseline of 0.45. Throughout the year we focused on increasing the use of our Don't Walk By (DWB) Hazard identification and Good Practice reporting platform, resulting in over 30,000 submissions and a corrective action closure rate of 95%. We also focused on our thinkSAFE commitments by rolling out a 10-hr workshop to all levels of the organisation and reinforced these commitments through on-going quarterly cultural training sessions. In collaboration with our global business unit EHS senior leaders and our Group EHSS team we developed a detailed strategy and plan for 2023 to include a strong focus on our 'TAKE 5' commitment.

We obtained insights of how our people feel about Morgan and completed a 'Your Voice' survey in 2022. The Health and Safety category within the survey scored the highest across the organisation where workplace safety, security and environment are considered important at Morgan, and if an employee identified a safety issue, they know their manager will act on it. This shows encouraging progress towards the caring culture we aspire to achieve.

Safety continued

Our efforts to achieve zero harm by enhancing safety rely heavily on data. By analysing historical and current data, as well as key performance indicators, our safety teams gain valuable insights into performance and trends, which help them take prompt action. To this end, in 2022, we made a significant investment in a new EHS management system software platform, and we have been working with the vendor to develop the safety-specific modules which will be rolled out in 2023. Moving forward, we will use the data insights from this new tool to focus on serious injury incidents, with a cross-business review of learnings to facilitate global action deployment. We plan to include safety dashboards and expand our database usage to monitor corrective action efforts. Besides injury numbers, the data we gather will enable us to track other critical information, such as the frequency of significant near-misses and employee absences due to injury, providing us with a real-time safety snapshot. By collecting and analysing monthly data, local leadership can observe any changes in risk levels and take prompt action to mitigate them before incidents occur. Based on the data, we will frequently review and update our metrics. We will utilise incident reporting to generate insights through data mining, statistical analysis, corrective action tracking, and other methods to reinforce Morgan's safety standards. We have already taken several leading indicator measures and plan to implement further initiatives in that direction.

ThinkSAFE workshops

At Morgan, our goal is 'zero harm', and as an organisation we work towards this goal with the use of our behavioural safety programme - thinkSAFE. The thinkSAFE programme consists of five key areas:

- We care for our colleagues, contractors and customers and we consider the impact of our decisions on them
- We must be trained for the work that we do, and we always follow the safety rules
- We 'TAKE 5' for safety before starting a task and STOP when there is danger
- We Don't Walk By hazards or unsafe behaviours, and we report the safety problems we identify
- We challenge positively when someone is in danger and we respect the person who challenges us

We provide thinkSAFE workshops for our employees, facilitated by our thinkSAFE ambassadors, who are trained employees from various departments, not just those in EHS. Through these workshops, attendees gain knowledge about the principles of the thinkSAFE Commitments and how to apply them in their everyday work and personal lives. To date, over 9,000 individuals, constituting 95% of our workforce, have participated in the workshops. The sessions are conducted over multiple meetings at our facilities and typically take 8-10 hours to complete. The thinkSAFE programme has significantly contributed to the development of a positive safety culture within Morgan, and it will continue to do so as we evolve the programme over time. The thinkSAFE workshops are not one-way presentations, but interactive discussions among cross-functional groups, where ideas and insights are shared, and improvements are implemented across all our sites.

Quarterly topics

The thinkSAFE programme is part of the way we work at Morgan. Employees attend thinkSAFE workshops and take what they have learned into their workplaces. However, we do not rely entirely on this training to embed a positive safety culture. There are many tools, within the programme, such as quarterly topics that we use to further develop and support our safety culture. Quarterly topics are provided in the format of PowerPoint presentations developed by the Group EHS&S team, provided with facilitator notes and videos. Quarterly topics have at times focused on the Commitments, for example 'TAKE 5', Don't Walk-By and Challenging Positively.

We provide the presentations in 16 languages, which are delivered by supervisors, thinkSAFE ambassadors, or other key personnel at our sites. The quarterly topics enable us to concentrate on a specific thinkSAFE Commitments in more detail, and they encourage us to prioritise safety through sustaining the conversation. These sessions are intended to stimulate discussion, foster communication, and gain a better understanding of the challenges faced by our teams. We are consistently reinforcing and actively discussing the thinkSAFE programme.

What next?

- Implementing 'EHS360', a stand-alone cloud based multi-module EHSS Management System to improve dynamic data, analysis and consolidate reporting platforms
- Making ergonomic improvements at several sites across the organisation
- Continuing our monthly and quarterly EHS&S topics
- Continuing our thinkSAFE workshops
- Refreshing our 'TAKE 5' pre-work assessment programme.

People

Having people who bring a diverse range of talents and perspectives, and who feel engaged in their role, is of paramount importance to our long-term success. Our employees have been instrumental in making Morgan Advanced Materials the company it is today. They are key to driving the brand forward and ensuring it remains relevant in the future. We work to attract, develop and retain the right people and ensure they are in the right roles.

We aim to be a caring organisation where everyone feels valued and appreciated. We use our 'Leadership Behaviours' and the Morgan Code to guide the actions we take. This helps us to achieve our strategic aim of delivering performance and value creation for our stakeholders.

In 2022, we launched three employee resource groups (ERG) to serve as a visible sign of our commitment to a diverse and inclusive workplace. The three ERGs are:

- Women@Morgan
- Military@Morgan
- PRISM – Pride, Respect, Inclusion and Support at Morgan, supporting our LGBTQ+ community and their allies

We held a number of inclusive events and supported chapters of our ERGs to get together on sites. We also took steps to address the feedback received from our previous global employee engagement survey, and improved our score to 53% (2021 50%).

To support the development of our people we relaunched our early careers programme, with an increased focus on diversity; 45% of the cohort were female. Following the launch of Women@Morgan, we held virtual and in-person events marking important dates such as World Menopause Day and opening direct lines of communication to leadership. A key area of development in supporting our women has been driving acceptance on open communication around gender issues. Our recent employee engagement survey told us that:

- Women are more engaged than men (57% v 52%) at Morgan
- Work life balance is better for women than men in Morgan (69% v 62%)
- 85% of women feel valued at Morgan, versus 81% for men

We are continuing our efforts to improve equality and transparency across the business. The UK Government requires gender pay gap reporting for companies with more than 250 employees and you can read our full report on our website.

What's next?

In 2023 we are supporting our hiring managers through our new licence to recruit programme. This initiative brings inclusiveness and diversity training to hiring managers, supports the implementation of more diverse hiring panels and supports the development of more inclusive language in our job adverts.

We are developing a global Respect@Work policy and introducing childcare and eldercare concierge services in some of our biggest geographies to support those in our workforce with caring commitments. We are also using the positive and negative feedback from our 'Your Voice' survey, to tackle the issues that our people have identified and care about the most.

We are focusing on the recruitment of our direct labour force. Our entry-level employees are the future leaders and managers of tomorrow and getting the gender balance right at this level will support greater diversity at the mid and senior levels of our organisation.

Governance

EHS360 Management System: global environment, health, safety & sustainability platform

During 2022, Morgan undertook an extensive review of specialist EHS&S software providers to identify suitable systems to improve data capture, accuracy and enhance standardisation of processes. A longer-term contract was signed with SAI360 at the end of 2022.

Over the course of 2023, the EHS360 Management System will be brought online globally, which will replace multiple existing systems and create formal EHS&S systems and tools in other areas. This includes Proactive Hazard Observation Reporting and EHS Positive Recognition, Incidents, Action Tracking, Audit, Inspections, Risk & Hazard Management (including Permit to Work), Training and Competence Tracking, and robust Environment and Sustainability KPI data capture.

Product lifecycle assessment

In 2022, Morgan undertook a pilot study in cradle-to-gate Life Cycle Assessment of our products. Four sites took part in the pilot which examined how the programme could work across different business units, across different product groups and the support required to roll it out more broadly across the business.

The study gave us insight into our upstream impacts, from both the raw materials that we purchase and the transport used to bring them to our manufacturing facilities, but also other fuel-related emissions, waste and water consumption. Internally it allowed us to compare the footprint of the same products produced at different sites, and to understand which parts of the processes were contributing to these differences.

The programme will be expanded in 2023 and we will complete EPDs and product carbon footprints on key products to better support our customers with their sustainability ambitions. Life Cycle Assessment software and training will also be rolled out in 2023 at our Carbon Centre of Excellence, to support the development of future sustainable materials platforms. This will allow us to work with our key stakeholders to reduce both direct and indirect emissions, minimising the complete lifecycle impacts of our products. Gaining insight into the full lifecycle impact of our products will help us to embed circular economy principles into our product design.

Sustainable sourcing

A large contributor to the overall life cycle impact of our products is the raw materials that we buy. Chaired by the Director EHS&S, the procurement committee will play a key role in compiling the inventory and developing our scope 3 mapping. A cross functional committee comprised of representatives from EHS&S, procurement, and ethics and compliance; the committee works with our top tier suppliers to ensure alignment with our Supplier Code of Conduct, and to map and track our suppliers progress on their environmental commitments. In 2023, we plan to send out a supplier ESG training pack to our top tier suppliers to ensure they align with our ambition. Completion rates will be monitored and discussed with the individual suppliers.

Our products and how they are helping to reduce carbon emissions

Through their life, our products typically save 10s or 100s of times the CO₂ emitted in manufacture. We estimate that around 60% of our products make a positive contribution, making the world more sustainable and improving the quality of life.

We make ceramic cores that are used to cast turbine blades for aero engines and industrial gas turbines. Our customers come to us for their most demanding applications, for example when they need to hold very fine features on small components. And these demanding applications arise as the next generation engines run hotter to be more efficient. Our cores enable those engine technologies.

We produce some of the leading brush grades for wind turbines, offering longer lifetimes than our competitors. In addition to enabling wind technology, we also drive lower maintenance activity, and costs, for the wind farm operators, further reducing the CO₂ footprint.

In the electrified rail market, we produce a range of collector strips and carbon shoes to connect the train to the power cable or rail. In the metro market in China, we have developed a wide range of high performance material grades to perform in the very varied climatic conditions across China. Our products directly enable electrified rail, and offer superior lifetimes, further reducing CO₂ emissions.

Governance continued

Task Force on Climate-related Financial Disclosures (TCFD)

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 Task Force on Climate-related Financial Disclosures (TCFD). Our full TCFD disclosure can be found on our website.

Climate change is a complex challenge to navigate, requiring the development of new methodologies and strategies, and developing new ways of thinking about the risks and opportunities to our business. We have built on our previous statement and improved in the following ways:

1. Our Net Zero Roadmap
Within the disclosure, we have shared our Net Zero roadmap which outlines our strategy towards Carbon Neutrality in 2050.
2. Scenario Analysis
In 2022 Morgan undertook a physical and a transitional scenario analysis pilot. As a large energy consumer, a potential risk to Morgan is exposure to carbon taxation. In response to the results from the scenario analysis, we have developed a kiln strategy and incorporated this into our Net Zero roadmap.
3. Further embedding of targets
Greenhouse gas emissions targets are now part of our Long-Term Incentive Plan (LTIP)

Climate change is one of the greatest challenges facing society. We believe it is important to all our stakeholders to report our approach in a transparent and robust way. The Task Force on Climate-related Financial Disclosures (TCFD) has developed a disclosure framework to help companies improve and increase the understanding of their reporting of climate-related financial information. We are pleased to be reporting in line with the recommendations for a second year and building on this disclosure in years to come.

The Science Based Targets initiative (SBTi)

SBTi defines and promotes best practices in emissions reductions and net-zero targets in line with climate science. It provides target setting methods and guidance to companies to set science-based targets in line with the latest climate science. Currently Morgan Advanced Materials' near-term GHG reduction targets are being validated in alignment with the 'well below 2 degree Celsius' (WB2C) methodology.



ESG Performance

ESG Performance against the United Nations Sustainable Development Goals and Global Reporting Initiative (GRI) Framework.

GREENHOUSE GAS (GHG) EMISSIONS	Unit	2022	2021	2020	GRI	SDG
Total CO ₂ e emissions (Scopes 1 + 2) ¹	MTCO ₂ e	211,104	229,887	276,678	305-1/305-5	12; 13
Direct CO ₂ e emissions (scope 1) ²	MTCO ₂ e	121,989	122,817	116,552	305-1	12; 13
Process emissions (part of Scope 1 GHG emissions) ³	MTCO ₂ e	4,516	4,070	4,600	305-1/305-5	12; 13
Total Indirect GHG emissions (purchases of electricity) (scope 2)						
Market Based ⁴	MTCO ₂ e	89,115	107,070	160,126	305-2	12; 13
GHG Intensity ⁵	MTCO ₂ e/ £m	190	242	304	NA	NA

- Total GHG emissions scope 1 and scope 2 only. Biogenic emissions are treated as carbon neutral and reported separately.
- Total scope 1 GHG emissions were calculated from the addition of emissions from fuels, refrigerants and other process emissions. Carbon emission factors are used to convert energy used in our operations to emissions of CO₂e. Carbon emission factors for fuels are provided by the International Energy Agency (IEA). We report our emissions with reference to the latest Greenhouse Gas Protocol Corporate Accounting and Reporting Standard. The data excludes emissions from Company-owned vehicles. For 2022, total scope 1 GHG emissions (tCO₂e) accounted was 121,889 tonnes, out of which 117,473 tonnes were derived from stationary fuel combustion sources and remaining 4,516 tonnes from process emissions.
- Process emissions disclosed (4,516 tonnes) in 2022 rely on historical calculations that could not be evidenced for assurance purposes.
- Scope 2 encompasses "indirect emissions" (the result of company activities occurring at sources owned or controlled by another company) associated with the production of purchased electricity. Scope 2 emissions physically occur at the facility where electricity is generated. For the Morgan scope 2 GHG emissions reported using market based GHG emission factors. Value for scope 2 GHG location-based only emissions are 161,235 tonnes.
- For manufacturing, we have selected an intensity ratio based on sales (on a constant currency basis). This aligns with our longstanding reporting of manufacturing performance. Emissions from the combustion of biogenic fuels (such as biomass and coffee husks) within our operations are reported separately from other scope 1 and 2 emissions, as recommended by the GHG Protocol, and are excluded from our intensity ratio calculation. The data also excludes scope 3 emissions and emissions from Company-owned and leased vehicles.

ENERGY	Unit	2022	2021	2020	GRI	SDG
Total energy consumption of entire Morgan Group	GWh	1,060	1,067	979	302-1	7; 12
Standard electricity consumption	GWh	217	278	366	302-1	7; 12
Green electricity (renewable and carbon free) consumption via electricity generated/purchased	GWh	205	140	22	302-1	7; 12
Share of green electricity (renewable and carbon free) in total electricity consumption	%	49%	33%	6%	302-1	7; 12
Utilities consumption (steam, hot water, etc.)	GWh	1	2	2	302-1	7; 12
Fuel used - Natural gas/Fuel oil/LPG/Propane	GWh	634	647	589	302-1	7; 12
Renewable energy consumption/total energy consumption	%	19%	13%	2%	302-3	7; 12

WASTE / Circular Economy	Unit	2022	2021	2020	GRI	SDG
Quantity of Total waste generated	MT	47,879	39,918	35,660	306-3	9; 12; 13
Quantity of Total waste reused or recycled (Hazardous + Non-Hazardous)	MT	25,406	21,547	18,214	306-4	9; 12; 13
Waste intensity ¹	MT/£m	43	42	39.2	NA	NA
Recycling rate	%	53%	54%	51%	NA	NA

- Calculated on constant-currency revenue basis, updated to reflect clarifications and changes in reporting methodology to ensure year-on-year consistency.

ESG Performance continued

WATER	Unit	2022	2021	2020	GRI	SDG
Total water withdrawal ¹	Million m ³	1.93	1.73	1.50	303-3	6; 12
Municipal/Government sources water withdrawal	Million m ³	1.32	0.99	0.91	303-3	6; 12
Ground water withdrawal (Water from Morgan Sources, borewell/GW well)	Million m ³	0.61	0.74	0.59	303-3	6; 12
Total water discharge ²	Million m ³	1.28	1.21	0.93	303-4	6; 12
Percentage of water discharged of total water withdrawal	%	66%	70%	62%	303-4	6; 12
Total Net Water Consumption ³	Million m ³	0.65	0.52	0.57	303-4	6; 12
Percentage of water consumed (Net Water Consumption) of total water withdrawal	%	34%	30%	38%	303-5	6; 12
Quantity of water used via Rainwater Harvesting Systems (water from other sources)	m ³	2,610	838	0	303-5	6; 12
Water withdrawal from high water stress areas ⁴	Million m ³	0.158	0.159	0.151	303-3	6; 12
Water discharge on sites with high water stress areas	Million m ³	0.029	0.042	0.032	303-4	6; 12
Water Intensity (withdrawal) ⁵	m ³ /£000	1.74	1.82	1.65	NA	NA

1. Water withdrawal on-site, within the calendar year, includes water sourced from mains/local authority/government/public supply, water extracted from a Morgan owned well/ borehole and water received from rainwater harvesting.
2. Water discharge includes water releases outside site boundary to river, pond, lake, unpaved/natural sewer, sea, land, etc. and includes water releases to local regulated sewer/drain, government pipeline, tanker etc
3. Net Water Consumption is calculated by the difference between water withdrawn and water discharged. This includes water consumption towards manufacturing processes, irrigation and sanitary use.
4. Water stressed areas include countries Spain, Italy, Turkey, Mexico, India, The United Arab Emirates, Argentina, Australia and the state of California, USA. These water stressed areas were identified based on 2020 country rankings database of 'Aqueduct Projected Water Stress Country Rankings'. (<https://www.wri.org/data/aqueduct-projected-water-stress-country-rankings>).
5. Calculated on constant-currency revenue basis, updated to reflect clarifications and changes in reporting methodology to ensure year-on-year consistency.

HEALTH & SAFETY	Unit	2022	2021	2020	GRI	SDG
Severity rate ¹	Number	21.5	31.1	29.8	403-10	3; 8
Number of Fatalities as a result of work-related injury;	Number	0	0	0	403-9	3; 8
Lost Time Accidents ²	Number	53	37	29	403-9	3; 8
Lost Time Accidents Rate ³	Number	0.28	0.22	0.18	403-9	3; 8
Number of Health & Safety certified sites at the actual scope (OHSAS 18001 / ILO OSH 2001 / ISO 45001)	Number	14	14	14	403-8	3; 8
Percentage of employees covered by an occupational health and safety management system %	100%	100%	100%	403-8	3; 8	
Percentage of temporary workers covered by an occupational health and safety management system	%	100%	100%	100%	403-8	3; 8

1. The severity rate is calculated by number of days lost divided by the number of lost time accidents.
2. A lost time accident (LTA) is defined as a work-related accident that results in one or more days of lost time.
3. LTA rate calculated as total number of lost-time accidents in the year, multiplied by 100,000 hours worked, divided by total number of hours worked.

ESG Performance continued

Employment	Unit	2022	2021	2020	GRI	SDG
Total headcount	Number	9,481	8,671	8,109	2-7	8
Morgan employees	Number	8,551	7,803	7,423	2-7	8
Agency workers	Number	930	868	686	2-7	8
Gender diversity	Unit	2022	2021	2020	GRI	SDG
Percentage of women in the total headcount:	%	34%	31%	27%	405-1	5; 8; 10
Percentage of women in senior management/ leadership roles (Board)	%	43%	43%	43%	405-1	5; 8; 10
Percentage of women in senior management/ leadership roles (executive committee)	%	30%	40%	33%	405-1	5; 8; 10
Percentage of women in senior leaders	%	26%	31%	27%	405-1	5; 8; 10
Percentage of women in all leaders (includes executive w/o CEO/CFO plus 2nd to 4th tier)	%	29%	29%	30%	405-1	5; 8; 10



ESG disclosures

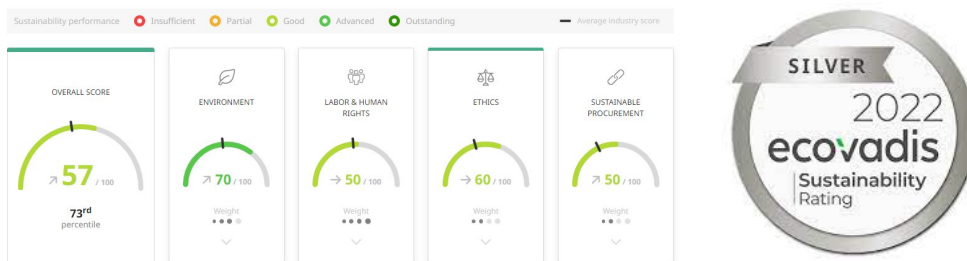
MSCI

An MSCI ESG Rating is designed to measure a company's resilience to long-term, industry material ESG risks. MSCI use a rules-based methodology to identify industry leaders and laggards according to their exposure to ESG risks, and how well they manage those risks relative to peers. The ESG Ratings range from Leader (AAA) to Laggard (CCC). As a result of our efforts to date, we have been awarded the AAA rating consecutively in 2022 and 2021.



EcoVadis

EcoVadis has become the world's largest provider of business sustainability ratings where their global network includes more than 100,000+ companies. Their sustainability assessment methodology is based on international sustainability standards (i.e. GRI, the UN Global Compact, ISO 26000) and includes an evaluation of how well a company has integrated the principles of sustainability/CSR into their business and management system.



EcoVadis's scorecard illustrates performance across 21 indicators in four themes, covering: environment, labour and human rights, ethics, and sustainable procurement.

The Morgan Group was awarded a 'Silver' medal in 2022 in recognition of our sustainability improvements.

In the past three years, we have demonstrated a significant progress across all four themes. In 2022, Morgan scored above the industry average across all four themes.

Carbon Disclosure Project - (CDP)

We continue to participate in climate change disclosures through CDP. In 2022 we scored a 'B', placing us at the management level. Our climate change score in 2020 was 'C' and in 2021 we received a 'B'. We have reported our carbon impact to CDP since 2010, with a strong focus on scope 1 and 2 emissions. We have begun implementing various initiatives to reduce our carbon impact, including implementing best practice where appropriate.

Our 2022 CDP Water Security submission, available at www.cdp.net, contains extensive disclosures on our water risks, opportunities, impacts and mitigating actions. We scored a 'B' (2021 'B'), placing us at the management level. CDP places companies at the 'management level' in recognition of their actions to reduce water use. The score also demonstrates that we have taken steps to assess water related risks to our business and implemented actions to mitigate those risks.

	2022	2021	2020
CDP Climate Change Score	B	B	C
CDP Water Security Score	B	B	No Scoring*

*For Morgan Group CDP water security submission started from 2021



Our policies

WE ARE COMMITTED TO A SUSTAINABLE FUTURE.

Our aim is to ensure that our products and manufacturing processes are designed, built and managed in a way that enhances their value to society and our environment.

Read our policies and practices on our website to learn how our ESG approach is governed.

- EHS Policy
- The Morgan Code
- Supplier Code of Conduct
- Conflict Minerals Policy
- UK Corporate Governance Code
- Tax Strategy
- Board and Committee Structure
- Board Committees and Terms of Reference
- Monitoring and Assurance
- Policies and Control Practices
- Board Inclusion and Diversity Policy
- Modern Slavery Statement
- Gender Pay Gap Report
- Human Rights Policy



Independent Limited Assurance Statement to Morgan

ERM Certification and Verification Services Limited (“ERM CVS”) was engaged by Morgan Advanced Materials plc (“Morgan”) to provide limited assurance in relation to the selected information set out below and presented in its 2022 Sustainability Report (the “Report”).

Engagement summary	
Scope of our assurance engagement	<p>Whether the 2022 data for the following selected disclosures are fairly presented in the Report, in all material respects, in accordance with the reporting criteria:</p> <ul style="list-style-type: none"> ▪ Total Scope 1 GHG emissions [tCO₂e] ▪ Total Scope 2 GHG emissions (location-based method) [tCO₂e] ▪ Total Scope 2 GHG emissions (market-based method) [tCO₂e] ▪ Energy use [GWh] ▪ Total net water consumption [m³] ▪ Total waste generated [metric tonnes] ▪ Waste recycled [metric tonnes] ▪ Water withdrawn in water stressed area [m³] ▪ Net water consumption in water stressed area [m³] <p>Our assurance engagement does not extend to information in respect of earlier periods or to any other information included in the Report.</p>
Reporting period	2022 (1st January 2022 - 31st December 2022)
Reporting criteria	<ul style="list-style-type: none"> ▪ WBCSD/WRI Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004, as updated January 2015) ▪ Morgan’s own internal reporting criteria and definitions (for water and waste)
Assurance standard and level of assurance	<p>We performed a limited assurance engagement, in accordance with the International Standard on Assurance Engagements ISAE 3000 (Revised) ‘Assurance Engagements other than Audits or Reviews of Historical Financial Information’ issued by the International Auditing and Standards Board.</p> <p>The procedures performed in a limited assurance engagement vary in nature and timing, and are less in extent than for a reasonable assurance engagement and consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.</p>
Respective responsibilities	<p>Morgan is responsible for preparing the Report and for the collection and presentation of the information within it, and for the designing, implementing and maintaining of internal controls relevant to the preparation and presentation of the selected performance data.</p> <p>ERM CVS’ responsibility is to provide conclusions to Morgan on the agreed scope based on our engagement terms with Morgan, the assurance activities performed and exercising our professional judgement. We accept no responsibility, and deny any liability, to any party other than Morgan for the conclusions we have reached.</p>

Basis of Qualified Conclusion

Due to incomplete GHG emissions inventory (process and mobile) and unavailability of information to support Morgan's chosen process related emission factors, we were unable to reach a conclusion on the completeness and accuracy over the following 2022 data and information:

- Total Scope 1 GHG emissions [tCO₂e]
- Scope 1 GHG emissions from Process emissions [tCO₂e]

Qualified Conclusion

Based on our activities, with the exception of the matters described in the 'Basis of Qualified Conclusion' section above, nothing else has come to our attention to indicate that the 2022 data and information for the disclosures for:

- Scope 1 GHG emissions from stationary fuel consumption [tCO₂e]
- Total Scope 2 GHG emissions (location-based method) [tCO₂e]
- Total Scope 2 GHG emissions (market-based method) [tCO₂e]
- Energy use [GWh]
- Total net water consumption [m³]
- Total waste generated [metric tonnes]
- Waste recycled [metric tonnes]
- Water withdrawn in water stressed area [m³]
- Net water consumption in water stressed area [m³]

are not fairly presented in the Report, in all material respects, in accordance with the reporting criteria.

Emphasis of Matter

We draw attention to Morgan's explanatory notes on Page 8 explaining the limitations in their calculations for Scope 2 GHG emissions (market-based method), these should be taken into account by users of the information. This does not affect our conclusion.

Our assurance activities

Considering the level of assurance and our assessment of the risk of material misstatement of the performance data, a multi-disciplinary team of sustainability and assurance specialists performed a range of procedures that included, but was not restricted to, the following:

- Assessing the appropriateness of the reporting criteria for the selected performance data.
- Interviews with management representatives responsible for managing the selected issues.
- Interviews with relevant staff to understand and evaluate the relevant management systems and processes (including internal review and control processes) used for collecting and reporting the selected disclosures.
- In-person visits at sites Fostoria (USA) and Stourport (UK), and virtual visit at site Haldenwanger (Germany) to review local reporting processes and consistency of reported annual data with selected underlying source data for each indicator.
- An analytical review of the year-end data submitted by all locations included in the consolidated group data for the selected disclosures which included testing the completeness and mathematical accuracy of conversions and calculations, and consolidation in line with the stated reporting boundary.
- Confirming conversion and emission factors and assumptions used.
- Reviewing the presentation of information relevant to the scope of our work in the Report to ensure consistency with our findings.

The limitations of our engagement

The reliability of the assured information is subject to inherent uncertainties, given the available methods for determining, calculating, or estimating the underlying information. It is important to understand our assurance conclusions in this context.

Force Majeure – Cyber attack

During our assurance engagement, Morgan was subject to a companywide cyber security attack. As a result, we were required to deviate from our original assurance program in relation to testing of site level evidence.

While we believe these changes do not affect our Qualified Conclusion above, we draw attention to the possibility that if we were to complete the site level testing as originally planned, we may have identified errors and omissions in the assured information that we did not discover through the alternative assurance program.

Our independence, integrity and quality control

ERM CVS is an independent certification and verification body accredited by UKAS to ISO 17021:2015. Accordingly, we maintain a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements. Our quality management system is at least as demanding as the relevant sections of ISQM-1 and ISQM-2 (2022).

ERM CVS applies a Code of Conduct and related policies to ensure that its employees maintain integrity, objectivity, professional competence and high ethical standards in their work. Our processes are designed and implemented to ensure that the work we undertake is objective, impartial and free from bias and conflict of interest. Our certified management system covers independence and ethical requirements that are at least as demanding as the relevant sections of Parts A & B of the IESBA Code relating to assurance engagements.

The team that has undertaken this assurance engagement has extensive experience in conducting assurance on environmental, social, ethical and health and safety information, systems and processes, and provides no consultancy related services to Morgan in any respect.



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