

LAING O'ROURKE

EXPLORE MANUFACTURING SUSTAINABILITY PERFORMANCE REPORT

2022



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INTRODUCTION

As a business, our ambition is to be a leader in sustainability and become a net zero operational facility by 2030.

Our journey to becoming a net zero business accelerated through the year as the 'Decarbonising manufactured concrete' project, which involved a comprehensive study into carbon reduction at our Centre of Excellence for Modern Construction (co-funded through a grant, awarded by the UK's Industrial Energy Transformation Fund (IETF)), was completed in August 2022. The results of the study have further supported the business in focusing on the right areas of operations and materials to achieve decarbonisation. Specific working groups have been established focusing on key work streams to ensure critical implementation. Those groups are already making great headway.

There have been some key highlights through the year that have supported our sustainability agenda. These have included:

- Delivery of low carbon concrete trials
- Roll out of hydro-treated vegetable oil (HVO) in our plant and equipment
- Success of the Family Fun Day
- Wider business engagement in the community including school visits, work experience placements and volunteering
- Investment in leadership training and engagement
- Biodiversity Action Plan established for the site

As a business we are committed to the protection and enhancement of the environment through implementation and continual improvement of our processes and products. We proactively minimise environmental impacts, including minimising direct and embodied carbon emissions, and providing energy-efficient / low-carbon products¹ for our clients.

Effective management of the environment, energy, carbon reduction, responsible sourcing and interactions with our communities is of key importance to the sustained success of our business. Our long-term success depends on sustainable business practices, including the investment in our people and our facility to adapt to new challenges. The Explore Manufacturing team has given its full backing to ensure that our net zero targets are achieved to support both our clients and our own internal targets.

JAMES LANGLEY
EXPLORE MANUFACTURING
GENERAL MANAGER



¹Our definition of low carbon concrete is aligned with that of ConcreteZero. That means it must meet with the Institution of Civil Engineers' (ICE) Grade A, or better

OUR OPERATIONS

Explore Manufacturing leads the construction industry in driving greater levels of design standardisation and quality by producing components via our Centre of Excellence for Modern Construction (CEMC) for building and infrastructure projects throughout the UK. The investment in CEMC, which opened in 2009, has united the power of our experience and knowledge of construction with state-of-the-art processes and technology, providing our clients and contractors with leaner, smarter and more cost-efficient options for the built environment.



Our £200M CEMC facility is located in North Nottinghamshire. It is Europe's most advanced concrete products manufacturing facility and employs over 400 people, who work closely with digital engineers and project teams to design and precision manufacture a range of components for use in major building and infrastructure projects. These include twin walls, floor slabs, pillars, high quality facades and our new digital modular bridges to span roads and railways.

In supporting the wider industry in a more sustainable future and acknowledging our expertise in offsite manufacturing, we are determined to be a catalyst for transformation in our industry. We know that we cannot do this in isolation and strongly believe in collaboration with our supply chain and industry partners.

Decarbonising materials is one of the biggest ways we'll reduce embodied carbon in the built environment in the long-term. Our overall business strategy provides a unique facility for low carbon concrete research and it's an area we've been firmly focused on over the past year.

As part of the Laing O'Rourke business we became a founding member of Concrete Zero in July 2022, with a commitment for at least 30% of our concrete to be low carbon² by 2025, 50% low carbon by 2030 and net zero concrete by 2050. Our programme has accelerated beyond this first target, and over 40% of our concrete was low carbon last year.

Our business is a member of MPA Precast. We're annually audited and commit to their Sustainability Charter. We are a partner of the Supply Chain Sustainability School and participate in their Offsite Construction working group.

In 2022 we also supported and contributed to their "Delivering Social Value through Offsite Construction Report".

We pride ourselves in being a responsible business and acting transparently when reporting our impacts and actions. Results of these are further detailed throughout the report.



² Our definition of low carbon concrete is aligned with that of ConcreteZero. That means it must meet with the Institution of Civil Engineers' (ICE) Grade A, or better

SCOPE 1 & 2

As a business we are committed to decarbonising our own operations by 2030. In working towards this goal, we have already implemented a number of initiatives.

ELECTRICITY

The electricity purchased for the facility is Renewable Energy Guarantees of Origin (REGO) certified, confirming that all our electricity is sourced from 100% renewable sources, which results in zero carbon emissions for our electricity usage. In 2022 we have saved 781 tonnes of CO₂e using REGO purchased electricity. As a business we actively support investment in UK renewable generation by only using electricity from renewable sources.



ENERGY USE

In 2022 the facility reduced kWh/production output (t) by 25% compared to 2020 baseline. In looking to further reduce our energy usage at the facility, we intend to extend the amount and depth of data being captured from the submetering systems already installed across the site.

A number of energy action plans are in place to reduce energy consumption across plant and equipment. In 2022 we successfully installed variable speed controls to the compressors that supply the automatic welding machine (AWM), robot and blast booth. This change allowed the compressors to run at 65% capacity, rather than 100%, and still deliver the same output. This improvement is expected to save 510,000kWh per annum.

HYDROTREATED VEGETABLE OIL

In early 2022 the business made a commitment to switch from diesel to Hydrotreated Vegetable Oil (HVO). Whilst HVO is considered an important stepping stone to a net zero carbon position, the ultimate goal is to eliminate all internal combustion engines from our facility and use electrical/ other power source alternatives to reach our group ambitious targets.

HVO differs from gas oil, diesel and petrol as it isn't derived from crude oil, the main cause of greenhouse gases, including carbon dioxide. HVO is made through the hydrotreatment of pre-existing bio-waste products such as used cooking oil, waste plant and organic matter. In switching to HVO over the past year we have saved 16 tonnes of CO₂e.

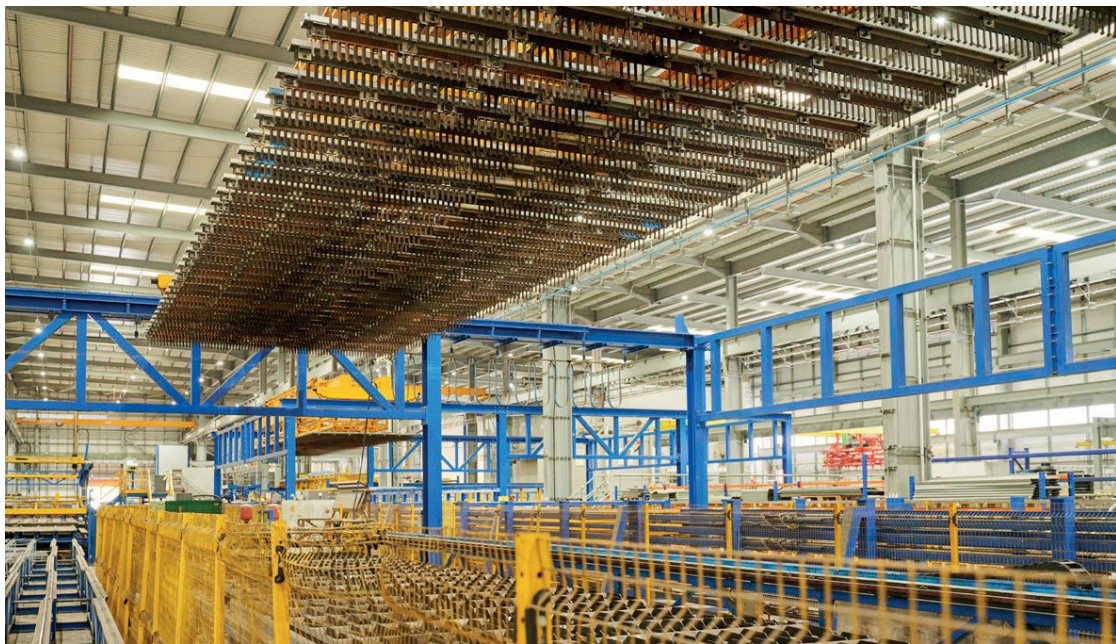
The HVO fuel that we use is certified by the International Sustainability & Carbon Certification (ISCC). ISCC certification supports full traceability of the supply chain to ensure the HVO fuel that we use does not contribute to negative indirect land use change (ILUC), such as deforestation.

Currently all of the HVO fuel that we procure derives from waste (as defined by the Renewable Energy Directive (RED II) and waste framework directive (2008/98/EC)). We are conscious that we need to monitor this as the market evolves and have therefore chosen a supplier certified by the Zemo Partnership, who provides certified feedstock traceability for all imported HVO on a quarterly basis. This provides us with confidence that the HVO we procure will never be associated with land clearance activities. As HVO demand increases across our operations we'll continue to monitor its sourcing.



PLANT OPERATIONS

Our plant decarbonisation plan has been developed, which looks to switch all plant from diesel/HVO to renewable sources. This transition will require significant investment and take several years to roll out. We hope to see the start of this roll out in 2023.



NATURAL RESOURCES

All water supplied to the facility is through a permitted abstraction licence from a borehole. Within the last year our abstracted water usage litre/production output (t) has increased by 82% versus 2021 usage, and 46% versus 2020 usage. A significant amount of work has been undertaken to understand the increase. Leaks have been found and repaired, new meters have been installed, and localised submetering has been installed across the facility to provide a more detailed view, with the aim to reduce overall abstraction. Further work and investigation will continue into 2023, with water usage having been identified as a key priority for the business.

With the aim to conserve natural resources, where possible we try to procure either recycled materials or by-product materials that can be utilised in our production operations. Reinforcement used within our products contains 98% recycled content. We have also increased the use of alternative cementitious materials from 39.35% in 2021 to 43% in 2022.



CIRCULAR ECONOMY

Total waste produced kg/production output (t) reduced by 4.9% from 2020, but increased by 10.1% from 2021 figures. As part of our decarbonisation commitment, a significant amount of work has been undertaken to understand waste on site. A working group has been set up to track waste generation against specific production processes. Load cells have been installed on specific production lines to ensure waste is accurately measured at source, with an overall aim to bring about a waste reduction for the facility.

99.82% of waste was diverted from landfill, which is 0.57% improvement from 2021.

Specific waste contractors have been appointed to manage specific waste streams throughout the year. Early in 2022 the facility appointed a waste contractor that collects, washes, and returns to the facility to replace all oily rags used for wiping down and cleaning production areas. This process reduces single use of rags, which are then disposed as hazardous waste. The cloths used in our manufacturing process can now be washed and reused up to 50 times.

To maintain our high health, safety and quality standards, the business made a significant investment to purchase new Personal Protective Equipment (PPE) for all staff. This was implemented in October 2022 to replace the existing workwear. To limit the impacts of waste from replacing the old PPE, a specialist waste contractor was identified. The appointed contractor was a specialist in textile shredding, clothing destruction and textile recycling with a pledge to send zero textile waste to landfill. As a group, Laing O'Rourke anticipated the old

PPE would equate to around 4.5 tonnes of recycled material, equivalent to saving 24,750kg of CO2e, and 4,500,000 litres of water. This recycling process for textile waste generated on site has remained in place for continued management of PPE waste.

Our operations generate a significant amount of hand protection waste. In 2022 we undertook a trial with a supplier to find a more sustainable solution. The aim of the trial was to ensure the product met the following criteria:

- Adhere to all health and safety requirements
- Maintain high quality
- Provide better cut and chemical protection
- Better durability
- Reduce waste

The results of the trial were a success with 100% approval from all wearers. Other results concluded that the standard glove range would on average be used for 2-3 days. The proposed new glove range achieved 10 days of use working in dry environments. These results were replicated in wet, oily and chemical environments with slightly different timeframes. An annual forecast found that by swapping to the new range, we would achieve a reduction of 30,684 pairs, equivalent to an annual saving of 67.29%, which as a result would reduce the amount of hand protection going to waste.

Since the success of the trial, the facility plans to launch the new gloves in a phased approach over the course of 2023.

ENVIRONMENTAL PRODUCT DECLARATIONS

To understand the full life cycle impacts of our products the business has started to develop Environmental Product Declarations (EPDs). EPD software was purchased in 2022 to enable delivery. The EPDs will provide us with an accurate assessment of the impacts of our products, which will give us a clear benchmark and understanding of where we need to make improvements. This will push the business to strive to continually improve product performance. The target is for the EPDs to be published in 2023. Generic EPDs are due to be developed for the following products:

- Columns/beams
- Lattice
- Twin wall
- Brick Façade
- Modular bridges
- Precast concrete façade



BIODIVERSITY

Since its original launch in April 2021, the business sustainability strategy has expanded to further integrate biodiversity and to positively contribute to the environments in which we operate.

Explore Manufacturing is situated on a 215-acre site with only 30 acres developed to date. Prior to Laing O'Rourke purchasing the site, it was formerly home to a coal mine, limestone quarry and brickworks and was a heavily contaminated brownfield site. When development works commenced for Explore Manufacturing, huge remediation works were undertaken prior to construction starting.

Since operations commenced, the estate has flourished and nature had started to take over areas that haven't been developed. To further understand the fauna and flora that is inhabiting our site, a biodiversity baseline assessment was completed in summer 2022 by a specialist ecological consultancy, East Midlands Ecology Consultant Ltd (EMEC). The assessment identified species that were already present within or near the site. A further biodiversity action plan was also developed, identifying opportunities to further enhance our estate. Over the next few years we intend to implement some of the recommendations to increase our biodiversity, and we'll look to re-survey in 2024 to determine whether the improvements have been a success.

In 2022 we also had the opportunity to home 10 beehives and planted wildflower seed around the hives. Installing the beehives created a real buzz around the facility, generating a significant amount of interest and engagement from employees. At the family fun day held in July we were able to sell the honey and donate the proceeds to charity.

Throughout the year we also worked with Nottinghamshire Wildlife Trust. In October 2022, 20 staff from the facility took part in a Wild Work Day at Idle Valley Nature Reserve. The day started with a guided walk which included an introduction to the work carried out at the reserve, noting key habitats, rewinding work and the species that are of special conservation importance. The team then participated in some essential winter tasks, including scrub clearance around the boardwalk on the reserve.

Following the success of the Wild Work Day and the opportunities the Trust offers, we plan to become a business partner with Nottinghamshire Wildlife Trust in early 2023.



COMPLIANCE

Carefully managing the environmental aspects and impacts of our business is important, and we are ISO14001 and ISO50001 accredited. Operating these systems allows us to fully understand our impacts on natural resources. We undertake regular reviews of our manufacturing activities, water and energy usage, and waste generated through the manufacturing processes.

There have been zero convictions for air and water emissions for 2022 for the facility.

We have implemented several energy, waste and production-specific environmental action plans to help drive continual improvement and increase our environmental performance. This has enabled further engagement with the production teams and helped to identify key sustainability opportunities that are understood and identified by the relevant expert for each area.

In 2022 we achieved BES6001 'Very Good' certification, which was an improvement from the 'Pass' achieved in previous years. Our BES6001 certification demonstrates that we're actively managing the impacts of our supply chain and our own performance.

In 2022 99.97% of the materials provided for our concrete mixes were supplied by companies certified to ISO14001, ISO9001 and ISO45001/OHS18001. 91.59% of materials provided for our concrete mixes were supplied by companies certified to BES6001.



In limiting our impacts as a business, we strive to support the local community and, where feasible, source materials from our local area. In 2022, 89.4% of the raw materials used in our products were sourced from within a 40-mile radius of our site.






Explore Manufacturing is delighted to have renewed its commitment to the MPA Precast Sustainability Charter and to have recertified as Charter Member in 2022. Our efforts to continually improve our sustainability performance has been reflected in our score, which has moved up from 87% in 2021 to 97% in 2022.



SOCIAL VALUE

As a family-owned business, we have always sought to ensure our work delivers a lasting benefit, connecting people and communities.

In 2022 the business launched its Social Value strategy, which includes 5 pillars:

THEMES	 Inclusive employment	 Thriving local economies	 Healthy communities	 Inspiring future generations	 Environmental net gain
PRIORITY OUTCOMES	Offer equal opportunities	Maximise local supply chain spend	Improve wellbeing of our people	Inspire and attract future talent	Achieve net zero carbon by 2050
	Upskill a diverse construction workforce	Develop diverse and resilient supply chains	Contribute to thriving local communities	Embed STEM within the national curriculum	Enhance community green spaces
2030 TARGETS	Enrich the lives of 2 million people				
	Create £2bn of social impact				

Our social value strategy provides a framework to ensure our work delivers a lasting benefit for the communities we serve. It allows our teams to adapt and focus on what clients and communities need. This could be more skills and employment opportunities, prioritising local supply chain partners, inspiring the next generation when it comes to careers in construction, improving community health and wellbeing or protecting the planet and nature.

Explore Manufacturing is part of the wider Laing O'Rourke Group and contributes to its strategic goal of enriching the lives of 2 million people and creating £2bn of social impact by 2030.

We work in partnership with social value specialists, Thrive, to record and monitor progress towards our social value targets. The Thrive platform enables us to report the progress we're making at a detailed level across all projects, and pinpoint opportunities for us to do more.

Thrive helps us to keep on track, challenging us to ensure we're delivering appropriately across all of the pillars and in partnership with communities. By attributing a financial metric to social impact, we're better placed to quantify its value.

During and in the aftermath of the pandemic, it was challenging to get social value initiatives off the ground. However, in 2022 we made great headway in connecting with local schools, universities, charities and our community.

Over the course of the year, we undertook 230 volunteering hours, which included helping improve our local nature reserve, holding stands at school and university career days, visiting schools and universities to delivering talks on STEM, modern methods of construction and sustainability, and supporting schools and university students in mock interviews.





In July 2022 the facility hosted a Family Fun Day for all employees' friends and family. This gave people the opportunity to see what we do behind closed doors. Several fun activities were arranged for adults and children with the aim of raising money for chosen charities.

Over the course of the year the facility has raised £6766 for various charities through several events, including:

- Family Fun Day
- Ukrainian Appeal
- Red Nose Day
- Charity Football Event
- Cake sales

Explore Manufacturing is proud to have supported the Supply Chain Sustainability School's 'Delivering Social Value Through Offsite Construction' report. The report, developed alongside Akertof and the University of Salford, described the social value benefits of offsite methods and explained how to optimise these benefits, providing guidance on social value measurement and reporting.

Explore Manufacturing's contribution formed part of the 'Supporting the growth of responsible and regional businesses' theme. Within this, we highlighted how our facility is continuing to provide a sustainable source of employment in the local area, since opening in 2009. 90% of our workforce live within 30 miles of the facility, and 74% live within 15 miles. We're proud to take an active role in supporting our local economy.



KEY PERFORMANCE INDICATORS

OBJECTIVE	KPI (2020 BASELINE)	2020	2021 ³	2022 ⁴	INDUSTRY TARGET	2024 BUSINESS TARGET
Responsible resourcing	Company to achieve at least a 'Very Good' through BES6001 responsible sourcing certification	Pass	Pass	Very Good	N/A	Very Good
	% of alternative cementitious materials to be at least 30%	33.73%	39.35%	43%	25% (target)	N/A
Energy reduction	Reducing overall energy intensity in production by 25% (kwh/production output (t))	128.05	96.8	97.07	54.89 (2019)	96.04
Carbon reduction	Reducing CO2 emissions for production (kgCO2/production output (t)) by 25%	7.61	8.45	5.51	11.43 (2019)	5.70
	Generate at least three generic Environmental Product Declarations for the facility	0	0	0	N/A	3
Waste reduction	Reduction of factory waste by 75% (kg/production output (t))	165.02	143.14	157.08	50.20 (2019)	41.25
	99% of waste to be diverted from landfill	99.95%	99.25%	99.82%	87.4% (2019)	99%
Water reduction	Reduction of water consumption by 90% (litres/production output (t))	1166	936.39	1705	134.84 (2019)	116.6
Community engagement ²	Facility open days to hold at least 1 a year	0	1	1	N/A	1
	Host at least 3 work experience/student placements in the year	0	1	11	N/A	3
Biodiversity	Biodiversity Action Plan to be developed for the site	0	0	1	1	1

KEY	2022 Progress Definition
	Not on track to meet 2024 target
	Not met but on track to meet 2024 target
	Achieved 2024 target

³ 2021 Data third party verified by CM Environmental March 2022

⁴ 2022 Data third party verified by CM Environmental March 2023

DECARBONISING PRECAST CONCRETE MANUFACTURING (DPCM)

Explore Manufacturing secured a grant from Innovate UK in 2021 to look at how to decarbonise concrete components manufactured at the facility and our operations. Awarded by the UK's Industrial Energy Transformation Fund (IETF), the grant allowed a consortium of experts from Laing O'Rourke, the University of Cambridge and the University of Sheffield's Advanced Manufacturing Research Centre (AMRC) to undertake initial research into the performance of the facility and simulate the changes that could be made to adapt to manufacturing low embodied carbon concrete product. The work has been programmed into three phases, these include: Research Phase, Implementation Phase and Operational Phase.

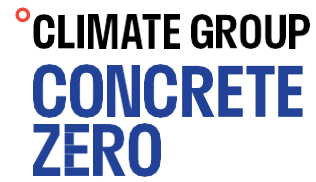
The research phase was completed in August 2022. This work involved reviewing past data to understand the true carbon footprint of Explore Manufacturing's product and facility, while also identifying key areas of opportunity for decarbonisation. As part of the research, the cement and steel used within our products were identified as carbon hotspots, requiring further investigation and a plan to continue to limit impacts.

In September 2022 the implementation phase of the project commenced. This work involves the establishment of four working groups, including members from across the business with specific expertise. The groups have been set the task of limiting the impacts identified during the research phase. Each working group is focused on specific issues, including: data collection, process optimisation, materials technology and product design. Each group sets quarterly objectives and deliverables to monitor, reporting how operational carbon can be reduced. The groups have already made great headway in trialing and developing their plans, and we hope to see the outcome of these in 2023.



CONCRETE ZERO

In July 2022 Laing O'Rourke was confirmed as one of the 17 founding members of the new ConcreteZero initiative, launched by the international not-for-profit Climate Group, in partnership with World GBC and WBCSD.



Further strengthening our commitment to deliver the ambitious global sustainability targets we announced last year, we have joined the pledge to reach 100% net zero concrete by 2050.

The public pledge also includes ambitious short-term commitments to use 30% low emission concrete by 2025 and 50% by 2030.

As a key provider of concrete products to the Laing O'Rourke business, and other clients who signed up to the commitment, Explore Manufacturing plays an integral part in meeting these targets.

As members of the initiative, we are breaking down barriers by establishing a baseline commitment to measure and report on the carbon emissions associated with the concrete we use. This data will enable the industry to define what low emission and net zero concrete is, bringing clarity and enabling collective action.

LOW CARBON PRODUCTS

In focusing on cement and reinforcement, a number of actions have already been introduced and implemented. Our procurement team is engaged with key suppliers (notably concrete, steel and aggregate) to identify opportunities to reduce our scope 3 emissions. For example, we have trialled a cement-free low carbon concrete (CEMFREE), which despite long curing times may provide a low carbon concrete suitable for filling bridge abutment voids. We have also trialled products containing higher proportions of GGBS (Ground Granulated Blast-furnace Slag) to ensure they still meet performance standards, and these have been successful.

We are investigating the use of reduced-carbon Electric Arc Furnace Steel and standardising low carbon concrete mixes. The business has worked closely with colleagues from the wider Laing O'Rourke business, including Expanded, Technical and Procurement, along with some of our supply chain partners, to test and refine different concrete mixes and products with lower volumes of cement – the most carbon intensive element of concrete.

The business has trialled the use of basalt fibre reinforced polymer (BFRP) in two structural systems as part of its Decarbonising Precast Concrete Manufacturing project.

Megaplink (below) is a one-way spanning precast concrete slab. Two units were produced, reinforced with BFRP meshes, using geopolymer concrete and AACM concrete. The use of BFRP saved 67% of the reinforcement's embodied carbon, and 22% across the overall unit.

Meanwhile, the Arup Vault prototype is a lightweight compression shell-based reinforced-concrete floor system, including a perimeter tension beam ring. Two tie-beam units were manufactured using geopolymer concrete and BFRP cages. The use of BFRP saved an estimated 72% of the reinforcement's embodied carbon, and 45% overall.



SUMMARY

Our ambition to become an operational net zero business by 2030 requires innovative thinking, constant development and investment to overcome the challenges associated with minimising both operational and embodied carbon.

In understanding our true impacts we appreciate that reliable and sophisticated infrastructure needs to be implemented in order to collect accurate data. Good quality data is vital to establish a baseline and monitor progress towards our targets. Over the past year we have made huge headway to improve the collection, quality and analysis of our performance data, which has enabled us to make targeted improvements.

Our R&D team consistently looks to challenge industry standards, trialling new material mixes and designs to reduce the embodied carbon of our products. Our operations team continues to identify key areas of opportunity to reduce our operational impacts.

Explore Manufacturing is on a mission to interrogate all aspects of its business processes from design, through to procurement and into production to ensure we meet our net zero targets.





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