

LAING O'ROURKE

EXPLORE MANUFACTURING SUSTAINABILITY PERFORMANCE REPORT

2021



THE POWER
OF EXPERIENCE

LAINGOROURKE.COM

INTRODUCTION

As a business we adapted to the challenges encountered by the COVID 19 pandemic and subsequently expanded to cope with increased demand from the market. During this period the benefits of our modern methods of construction have become more apparent to both public and private sector clients, our business model has been instrumental to our ability to maintain production delivery through the crisis. As well as boosting productivity, it is the means to creating a sector that is digitally skilled, more diverse and, as a result, more innovative. 2021 has been the factories busiest year since the facility opened in 2009 with our production output increasing by 46% on prior year.

In 2021 our parent company Laing O'Rourke released their Group Sustainability Strategy which committed us to becoming net zero company before 2050. Our journey to becoming net zero accelerated through the year as continual investment was pumped into research and development (R&D) to help drive innovation. Last year also saw the launch of the 'Decarbonising manufactured concrete' project which involves a comprehensive study into carbon reduction at our Centre of Excellence for Modern Construction and is being co-funded through a grant, awarded by the UK's Industrial Energy Transformation Fund (IETF). We also became a member with MPA British Precast which has proved further insights into the wider industry, gaining access to sustainability reporting tools and has allowed our team to become involved in several key committees.

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 products for our clients.

Climate change is a global emergency and we recognise that the time for serious action is now and as an industry we understand that sustainability is the biggest challenge we currently face.

We pride ourselves in being a responsible business and acting transparently about what these are, measuring them accurately and then acting to minimise them. Results of these actions are further detailed throughout the report.

Effective management of safety, health, environment, quality, energy, carbon reduction, and responsible sourcing is of key importance to the sustained success of our business. Our long-term success depends on sustainable business practices and 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

CENTRE OF EXCELLENCE FOR MODERN CONSTRUCTION
GENERAL MANAGER



NET ZERO COMMITMENTS

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 products for our clients.

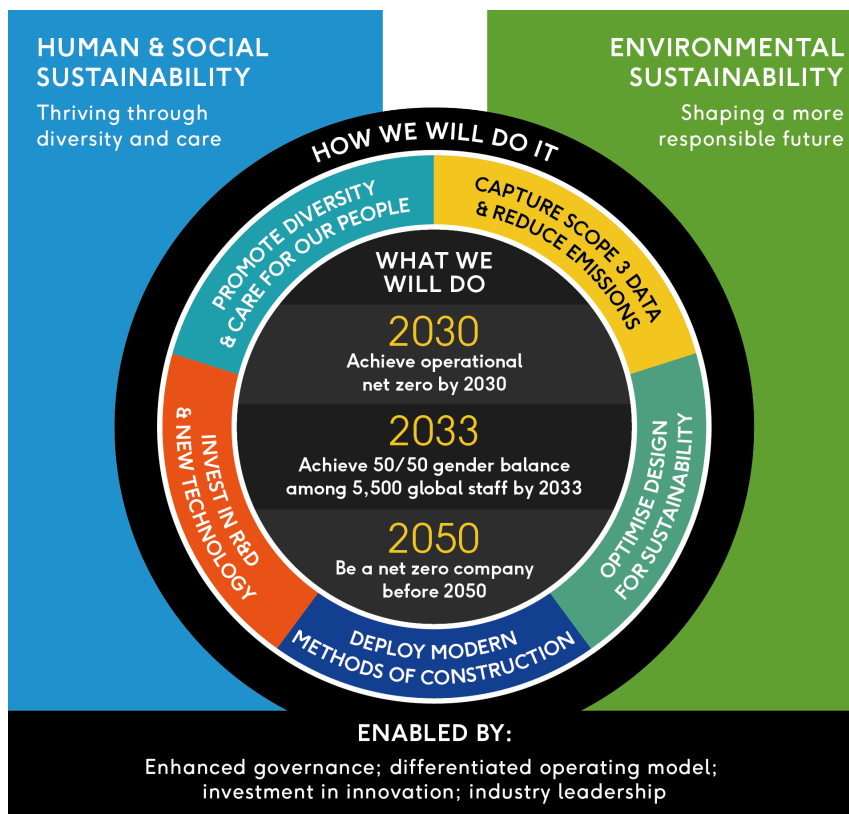
Climate change is a global emergency and we recognise that the time for serious action is now and as an industry we understand that sustainability is the biggest challenge we currently face.

We pride ourselves in being a responsible business and acting transparently about what these are, measuring them accurately and then acting to minimise them. Results of these actions are further detailed throughout the report.

Effective management of safety, health, environment, quality, energy, carbon reduction, and responsible sourcing is of key importance to the sustained success of our business. Our long-term success depends on sustainable business practices and 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 products.

In working towards our commitments further deliverables have been developed for the wider business and Explore Manufacturing to drive continual improvement these include but are not limited to:

- Business carbon abatement projects
- Waste reduction targets
- Development of Environmental Product Declarations
- Supplier engagement
- Data capture
- Understanding Scope 3 emissions and;
- Social impact strategy



DECARBONISATION PROJECT

Explore Manufacturing known as Centre of Excellence for Modern Construction (CEMC) secured a grant from the UK Government to support a project looking at how we can decarbonise concrete components manufactured at the facility.

The grant, awarded by the UK's Industrial Energy Transformation Fund (IETF), will co-fund the work with a consortium of experts from Laing O'Rourke, the University of Cambridge and the University of Sheffield's Advanced Manufacturing Research Centre (AMRC).

The IETF, which is managed by the Department for Business, Energy and Industrial Strategy (BEIS), is designed to help businesses cut their energy usage and carbon emissions by investing in energy efficiency and low carbon technologies.

The 'Decarbonising manufactured concrete' project involves a comprehensive study into carbon reduction at CEMC.

The project team will investigate every facet of the production process, from the use of low carbon concrete, steel and aggregate materials and technologies, to the systems used to create formwork and cure products.

The outcomes of the project and proposed recommendations for the facility are planned to be released in Spring 2022.



AUDITING, CERTIFICATION & MANAGEMENT SYSTEMS

- ISO9001, ISO14001 and ISO5001 annual audits completed
- Gained Chartered Status under the MPA British Precast Sustainability Charter
- BES6001 Responsible Sourcing – Pass
- CARES and UKCA certified
- Commenced the development of Environmental Product Declarations

ENERGY & CARBON

- kWh/production output (t) reduced by 25% from 2020
- Renewable Energy Guarantees of Origin (REGO) certified for electricity
- Electric vehicle charging points installed
- Feasibility study undertaken for transitioning our plant from diesel to Hydrotreated Vegetable Oil (HVO)
- Innovate UK decarbonising precast concrete manufacturing study commenced

NATURAL RESOURCES

- Abstracted water usage litre/production output (t) reduced by 20% from 2020
- Look to further interrogate our data to understand how water is being used in all processes
- Zero convictions for air and water emissions
- Rebar used within our products has 98% recycled content

CIRCULAR ECONOMY

- 99.28% of non-hazardous waste was diverted from landfill
- Total waste produced kg/production output (t) reduced by 15% from 2020
- Utilising materials between business units to avoid sending materials offsite as waste

COMMUNITY ENGAGEMENT

- 80% of our workforce live within 30 miles of the facility
- Community open day undertaken November 2021
- Supplier engagement day undertaken October 2021
- 87% of our aggregate materials delivered to site in 2021 was sourced within 40 miles of the facility

TRANSPORT

- Work with Explore Transport to maximise delivery capacity and utilise return journeys
- Work with projects to provide the service of returning transportation materials to the facility for reuse for future use

¹*2021 Data third party verified by CM Environmental March 2022

ENVIRONMENTAL RESPONSIBILITY

ELECTRICITY

The electricity purchased for the facility is Renewable Energy Guarantees of Origin (REGO) certified, confirming that all our electricity is from 100% renewable energy which results in zero carbon emissions for our electricity usage.

ELECTRIC VEHICLE CHARGING POINTS

In 2021 a number of electric vehicle charging points were installed at the facility, these were installed to accommodate the business moving staff vehicles from diesel to electric/hybrid vehicles.

HYDROTREATED VEGETABLE OIL (HVO)

On our journey to reducing emissions a working group has been set up in the business to understand how the facility can transition from red diesel to Hydrotreated Vegetable Oil (HVO). Full transition is planned for early 2022. Whilst HVO is considered an important stepping stone to a net zero carbon position, the ultimate goal is to eliminate all internal combustion engines and opt for electrical 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.

ENVIRONMENTAL PRODUCT DECLARATIONS

To fully understand the full life cycle impacts our products the business has started to draft Environmental Product Declarations (EPDs) through One Click LCA tool available through MPA British Precast. The EPDs will provide us with an accurate assessment of the impacts and benchmark the products current performance. These assessments will give us a clear benchmark and understanding in where we need to make improvements. Benchmarking our products will push the business to strive to continually improve the performance of our products. The target is for the EPDs to be published in 2022. Generic EPDs are proposed to be developed for the following products:

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



ACCREDITED SYSTEMS

In managing the environmental aspects and impacts of our business we're ISO14001 and ISO50001 accredited. In operating these systems it allows us to fully understand our impacts on natural resources. We undertake regular reviews on our manufacturing activities, water and energy usage and waste generated through the manufacturing processes.

We have implemented a number of energy and waste actions plans to help drive continual improvement and increase our environmental performance, we hope to see the results of these plans in 2022.



RESPONSIBLE SOURCING

In 2021 we were BES6001 certified, which ensures we're actively managing the impacts of our supply chain and our own performance. In 2021 85% of our supply chain were ISO14001, ISO9001 and ISO45001/OHS18001 certified.

In limiting our impacts as a business we strive to support the local community and where feasible source materials as close as possible to the facility. In 2021 87% of the raw materials used in our products were sourced within a 40 mile radius of our site.



HEALTH AND SAFETY

We constantly strive to make safety our highest value. We can only truly achieve this through a new approach that puts our people first.



Rethinking safety through

INCLUSION + WELLBEING

As we seek to transform the industry and the way we go to work, we're committed to rethinking safety to always place it as our highest value and seek to continuously improve; not just in our words, or policies, or systems – but in all our actions, the way we behave and how we treat each other.

Our inclusion and wellbeing approach will ensure safety is a physical and psychological. It promotes a culture where everyone is included no matter what role they play. Everyone has a voice at every stage of the facility process. Everyone will be empowered to speak up and call out any process or behaviour which doesn't feel right. The programme sets a standard for safety and leadership through three core areas of focus:



ENGINEERED SAFETY

Engineered Safety is about **engineering out risk and engineering in health** at every stage of the project lifecycle. This is achieved through working closely with our design consultants and employing a **modern methods of construction** approach.



DELIVERY EXCELLENCE

Delivery Excellence ensures a robust implementation of our **leading standards** and **H&S management system**, where we will champion consistent engagement with our workforce. This is underpinned by clear lines of **operational accountability and competence**.



HUMAN PERFORMANCE

Human Performance is how we enable our people. We will create a working environment that **supports people's holistic health**, enabling them to sustain high performance by managing their **personal energy and capacity levels**.

ENGINEERED SAFETY

Utilising our new Design Partner Frameworks and maximising Modern Methods of Construction, we will work with designers, clients, and suppliers to 'engineer out risk' and 'engineer in health' at every stage of a project/product's lifecycle.

DELIVERY EXCELLENCE

During delivery, we will ensure that there is strong safety leadership through clear lines of operational accountability and competence. This will include robust implementation of our leading standards and our Safety Management System (SMS). We will focus on people using their strengths, skills, knowledge, and Laing O'Rourke's power of experience to improve all elements of physical and mental wellbeing. Through clear leadership we will understand risks, verify controls, embed learning, and share successes.

HUMAN PERFORMANCE

We will invest in advanced concepts around holistic wellbeing and our people's ability to thrive. In so doing, we will provide them with a supportive and psychologically enriching work environment that allows them to perform consistently at their best.

SAFETY AS OUR HIGHEST VALUE



ENERGY PULSE

The past 2 years have been extremely difficult during and following the COVID-19 pandemic for our staff. We recognise that it has been an intense time on both home and work fronts.

In recognition of this the business offered Energy Pulse sessions which helped staff understand how to create more energy when you needed, how to renew energy and how to recover from periods of high performance or demand. The workshops provided staff with tools and techniques to understand how to get the best of themselves at work and at home.



As business we plan to roll out more sessions to the whole workforce in 2022.

Energy and Capacity Management

Helping you bring more energy to both work and home

When we're at our best we bring energy to what we're doing and those around us.

BUT

- We are living and working in a time where demand is high and there is no off button.
- We're designed to move between energy spend and energy recovery and we sacrifice the recovery part too often.
- We are taking a new approach to work that is focused on making it more workable by managing everyone's personal energy and capacity.

Mental
FOCUS

Emotional
QUALITY

Physical
QUANTITY

Purpose
MEANING

COMMUNITY ENGAGEMENT

Having battled a global pandemic the past couple of years it has been increasingly difficult for us to participate in a number of events within the community. However, we have been able to continually engage with the North Nottinghamshire Skills and Employment Board meetings.

In November 2021 the facility hosted an Open Day to the local community. This gave people the opportunity to see what we do behind closed doors and enquire about potential employment positions with the facility and wider group. As well as a tour of the facility the event also hosted a number of rooms to give people an insight into other functions that feed into the manufacturing processes, these included sustainability and design.

The event was a great success with approximately 60 people attending, positive feedback was received from a number of the attendees.

We look forward to hosting future events in 2022 and we have already received requests from local schools to host more engagement activities.

In December 2021 prior to the Christmas shutdown we hosted several events within the facility, one event included a Christmas raffle which raised money for Mind Nottinghamshire.



KEY PERFORMANCE INDICATORS³

Objective	KPI (2020 baseline)	2020 (Baseline)	2021	Industry target	Business target
Responsible resourcing	Company to achieve at least a 'Very Good' through BES6001 responsible sourcing certification	Pass	Pass	N/A	Very Good
	% of alternative cementitious materials to be at least 30%	33.73%	39.35%	25% (target)	>30%
Energy reduction	Reducing overall energy intensity in production by 25% by 2024	128.05	96.8 / 24.41% reduction	54.89 (2019)	96.04 (kWh/tonne) / 25%
Carbon reduction	Reducing CO2 emissions for production (kgCO2/tonne) by 25% by 2024	7.61	8.45 / 11.10% increase	11.43 (2019)	5.70 / 25%
	Generate at least three generic Environmental Product Declarations for the facility	0	0	N/A	3
Waste reduction	Reduction of factory waste by 75% (kg/tonne) by 2024	165.02	143.14 / 14% reduction	50.20 (2019)	40.05 / 75%
	99% of waste to be diverted from landfill	99.95%	99.25% / 0.7% increase	87.4% (2019)	99%
Water reduction	Reduction of water consumption by 90% by 2024	1166	936.39 / 20% reduction	134.84 (2019)	116.6 / 90%
Community engagement ⁴	Facility open days to hold at least 1 a year	0	1	N/A	1
	Host at least 3 work experience/ student placements in the year	0	1	N/A	3
Health & Safety	Reduction of lost time injury rate (LTIFR)	1.06	1.2	4	-
Biodiversity	Biodiversity Action Plan to be developed for the site by 2024	0	0	1	1

^{3,4} *2021 Data third party verified by CM Environmental March 2022

Laing O'Rourke has developed an innovative carbon calculator that can decarbonise project bids by up to 19%.

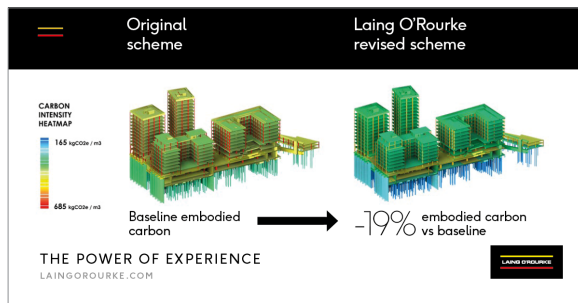
The tool can quickly analyse levels of embodied carbon in digital designs, enabling its technical team to reduce the carbon content of projects.

Embodied carbon content of the sub and super-structure elements of a typical building project can account for more than half of the upfront embodied carbon.

The material database for the tool has been developed using information provided from the Inventory of Carbon and Energy (ICE) database and continues to grow as the business adds Environmental Product Declaration (EPD) data from its supply chain partners.

The detailed analysis is building on the benefits of Laing O'Rourke's offsite-manufacturing capability and operating model which includes products from Explore Manufacturing.

In understanding the footprint of our products and how it contributes to overall building performance, it drives the business to seek more sustainable solutions in reducing the embodied carbon of our products.



Enabling the Circular Economy within the Built Environment

Aim

A key design driver of the product based structural solutions, has been to significantly reduce product embodied carbon and place greater focus on the consideration of the whole life impact of materials. An important aspect has been to enable end-of-life disassembly and reuse, thereby enabling circular economy principles within the built environment.



Photo 1: Innovative products being manufactured at Explore Manufacturing

Designed for Future Disassembly and Reuse

Design

With precast concrete components manufactured Explore Manufacturing, high quality and enhanced tolerances are achieved. To enable future disassembly and reuse, structural design life periods have been increased to 120 years, and innovative bolted steel connections are employed. This enables component jointing without the need for traditional structural concrete toppings, with only grouted joints between precast components.

Manufacturing

Within the manufactured products, we are investigating embedded tagging technologies that consider the principles of material passports. This creates a link for

future traceability of manufacturing and supply data, including size, place of manufacture, concrete data and test results, load, capacity and radiant cooling details.



Photo 2: M-Frame delivered at Explore Manufacturing P88 Demonstrator

Assembly and Disassembly

The solutions employ innovative bolted steel connections designed to allow future disassembly, that is efficient and safe. Without structural toppings, traditional demolition is significantly reduced, leaving only the component slab joints which are filled with minimum strength grouts to enable either easy saw-cutting or hydro-demolition without damaging adjacent precast components; this builds upon trials investigating the demolition of precast grouted joints.

Reuse

Utilising fully or partially dismantled and refurbished products, the goal is to create an industry market in renovation and re-use of the precast components, directly applying the principles of the circular economy to the built environment. A product-based approach to construction drives standardised products, and so future market availability will enable relatively simple reuse.

SUMMARY

In our ambition to achieve net zero, it requires innovative thinking and constant development to overcome the challenges associated with minimising concrete cement content while maintaining high quality control.

It is generally well accepted that the embodied carbon emitted from the production of the raw materials themselves is the greatest challenge for any construction product. In benchmarking the performance our products it gives us greater clarity on where we need to make improvements in product performance.

Our R&D team consistently look to challenge industry standards in trialling new mixes and designs to reduce the embodied carbon of our products.

However it's not only the R&D team that can deliver solutions in reducing our impacts. Explore Manufacturing's sustainability journey is on a mission to interrogate all aspects of the business processes from design, through to procurement and into production to ensure we meet our net zero targets.





THE POWER
OF EXPERIENCE

LAINGOROURKE.COM