



# XAAR

**Xaar plc**  
Annual Report and  
Financial Statements 2021



# Our vision

## **A world where you can print anything you can imagine.**

# 2021 at a glance

## Building for the future

Our customers seek to work with partners who can help them get their products to market efficiently and effectively and who can support them throughout the product lifetime.

Our strategy is to provide an integrated solution for our customers and to work collaboratively with them so that they get to market more quickly whilst delivering innovative and robust products. This strategy will ultimately ensure we sell more printheads.

 [Read more on page 11](#)

## ImagineX

Our ImagineX printhead platform is already delivering unique product capabilities such as printing at up to 100 metres per minute.

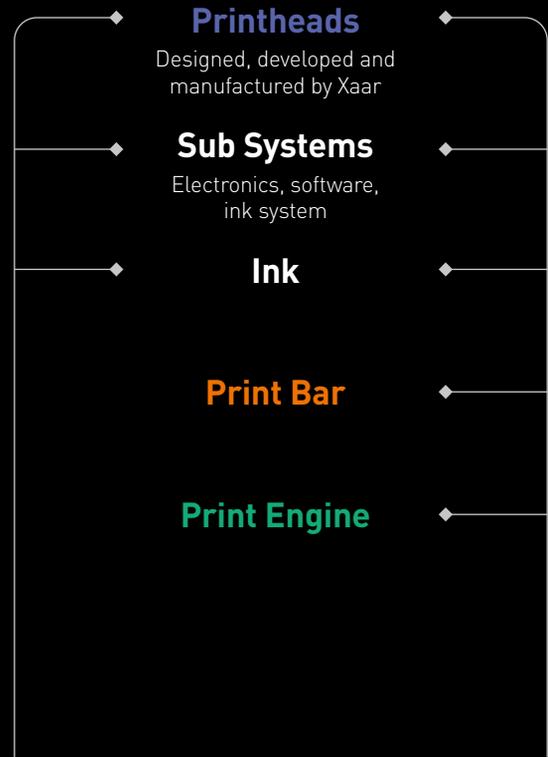
### 2021 product launch: Xaar Nitrox



- + Print fast**  
Operating up to 48kHz, combined with drop-in plug and print capability, for getting up and running at speed in minutes
- + Print perfect**  
Unbeatable uniformity with TF Technology and AcuChp for printing perfectly the first time and every time
- + Print almost anything**  
The widest application window and ability to handle broadest range of fluids

 [Read more about the ImagineX platform on page 2](#)

# XAAR



OEMs



UDIs

## Integrated solutions

 [Read more about our strategy for delivering more integrated inkjet solutions on page 11](#)

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## Business responsibility

Our three main areas of focus during 2021 have been: sustainability, employee engagement and charity support.

### Sustainability

Our Sustainability Roadmap centres on four areas, each of which has a goal:

- + Environment
- + People
- + Innovation
- + Community

 [Read more on page 28](#)

### Employee engagement

Our success depends on the capability and engagement of our people, which has included a focus during 2021 on embedding our values deeper into the Xaar culture.

 [Read more about employee engagement on page 3](#)

### Charity support

We continued our support of local charities via a collaboration with Break charity's Cows About Cambridge Event.

 [Read more about our charity support on page 3](#)

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## New opportunities

During the course of 2021 we have seen a broadening of the range of applications using Xaar technology and a number of our OEMs launched new machines based on Xaar technology.

OEM products launched included an industrial grade print engine in China and an entry level 3D printer in Europe. We also collaborated with materials science company, Meta Additive, recently acquired by Desktop Metal, who have used our technology to push the boundaries of binder jetting technology.

 [Read more about our new opportunities on page 3](#)



## Driven by our mission

We help companies and industries be more colourful, creative and productive through our world-class technology and printheads.

### Overview

We are a world leader in the development of digital inkjet technology. We design and manufacture printheads which we sell globally to Original Equipment Manufacturers (OEMs) and User Developer Integrators (UDIs).

Our technology drives the conversion of analogue printing and manufacturing methods to digital inkjet, which is more efficient, more economical and more productive than the traditional methods it replaces.

We also develop print systems for product decoration and 3D printing which use our inkjet technology, and our digital imaging business, FFEI, provides high performance digital imaging technology for two main applications – inkjet printing and digital pathology.

We put innovation and collaboration at the core of our global partnerships, helping our customers to unleash the true power of our technologies and open up a world of opportunities for their business, today and into the future.



#### Our culture

We champion a values-led culture so each member of our team is empowered to do their very best, creating a working environment that people love to be in and where we can all achieve our ambitions.

▶ Watch our new video demonstrating how these values are part of our day-to-day lives.

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## Building for the future

**We place customers at the heart of our strategy. It is only when our customers are successful that Xaar is successful and our aim is to be the partner of choice, enabling our customers to respond quickly and efficiently to changing market needs with robust and reliable products that are powered by Xaar technology.**

Our strategy is to provide integrated solutions, allowing our customers to access not only Xaar's leading printhead technology but also the ink supply and electronic control systems required to ensure sustained and reliable performance from a wide range of fluids that deliver market leading print quality every time.

Our ImagineX printhead platform delivers unique capabilities: 720 dpi print resolution, Ultra High Viscosity and High Laydown Technology printing at speeds of up to 100 metres per minute.



We launched two new printheads from this platform during 2021 and have an ongoing roadmap of product developments to enable our customers to address a broader range of applications.

The acquisition of print systems and printbar specialist FFEI in 2021 widens our product range for our OEM and UDI (User Developer Integrators) customers with a broader product range including Xaar Versatex print engines for adding effects and embellishments digitally.

At the heart of our **new ink strategy** is a close collaboration with leading fluid companies to fully optimise the fluid for the best print performance, not just in the printhead testing lab, but also throughout the machine development programme, through to user integration and beyond. UDI customers can also buy their fluids direct from Xaar, giving them a single point of contact for both the printhead and the fluids, saving them time and simplifying the development process.

**Our new Ink Supply System roadmap** will ensure we can deliver products that help customers evaluate and adopt our technology whilst also reducing their time-to-market. We offer a number of inkjet supply systems under the Xaar brand, and have further added to our capability with the acquisition of Megnajet in March 2022. One of the market leaders, Megnajet designs and manufactures industrial ink management and supply systems for digital inkjet.

These easily integrated products are among the most compact ink management and supply systems on the market today, with options of fast and reliable routes to market when developing industrial inkjet printers.

The acquisition of Megnajet is part of Xaar's growth strategy which focuses on offering our customers, particularly UDIs, a more integrated inkjet solution, which will attract a broader range of opportunities for us.

In turn, UDI customers will be able to reduce their development timescales and shorten their time to market. This acquisition also enables Megnajet to focus on growth through new developments and shared expertise.

Whilst enabling a broader range of products under the Xaar brand, Megnajet will also continue to offer products to a wide customer base (sectors), under the Megnajet label.

In addition, our datapath roadmap has been developed to provide a rich portfolio of datapath products to enable our customers to build their own systems more easily which take advantage of the full potential of our ImagineX platform.

### EPS progress

In 2021 we achieved +9% growth in sales. In addition, we changed the leadership of EPS and strengthened our teams in Finance, Human Resources, and EH&S Management, as well as re-organising the sales team into two distinct groups.

 [Find out more on page 22](#)

### FFEI progress

Since acquisition in July, the alignment with Xaar has progressed well. In addition, FFEI has developed its roadmap of integrated inkjet systems for Xaar to sell to its UDI customers, with the first product launch in March 2022. On the life sciences side of the business FFEI has continued to develop its product portfolio and now has a pipeline of next generation scanning technologies. Some technologies are very close to market readiness, others require further development. FFEI is now looking for new partners to reap the rewards of these next generation scanning systems.

 [Find out more on page 23](#)

## New opportunities

### During the course of 2021 we have seen a broadening of the range of applications using Xaar technology.

- Chinese OEM, King Tau, a pioneer in the ceramics and graphics sectors, launched a new industrial-grade print engine, The 'Magic Cube', incorporating Xaar's advanced printhead technologies.
- Beijing National Innovation Institute of Lightweight Ltd. (BNI) and Xaar announced a Joint Laboratory to develop new applications in digital inkjet such as printing glass, electronics, 3D and automotive spray painting.
- The wide operating window and unique technologies within the Xaar 1003 printhead have enabled Meta Additive to use a variety of fluids that had previously been seen as too difficult to jet. With Xaar technology, Meta Additive was able to move beyond the conventional limits of inkjet printing with its binder jetting innovation.
- The Xaar 2002 printhead is successfully addressing the current ceramics trend for printing big slab applications such as dining tables, kitchenware and sanitary ware, where tile viewing distances are much closer. Customers are looking for higher quality tiles with higher resolution and definition, produced by our 720 dpi capability – no other printhead can deliver resolution this high and with this capability we have now set the image quality standard in ceramics.

- In the 3D printing market, dp polar launched its latest machine, the AMpolar® i1 which jets 3D parts at volume on a truly industrial scale. The combination of scalability, productivity and agility of this new machine achieves an output that traditionally would have required multiple conventional 3D machines, and significantly more capital investment.
- Xaar continues to see a growing number of new opportunities within the 3D printing markets. Our technology offers significant advantages and therefore value for managing high viscosity fluids and delivering industrial levels of reliability across a range of additive manufacturing applications and emerging technologies.

EPS ended its year by landing the largest single order in the Company's history which will be manufactured and delivered during 2022. The Company closed 2021 with a strong order book for bespoke systems and a plan for continued strong growth for 2022.

Xaar's recent acquisitions of FFEI and Megnajet enable us to offer our customers, particularly UDIs, a more integrated inkjet solution, which will attract a broader range of opportunities for us from here on in.

 [Read more on page 12](#)

## Business responsibility

### We operate as a socially, culturally and environmentally responsible business.

### Our three main areas of focus during 2021 have been: sustainability, employee engagement and charity support.

#### Sustainability

During 2021 we set up a Sustainability team with members from across the Company to work on a roadmap of projects with defined objectives. The Roadmap centres on four areas, each of which has a goal:

#### 1. Environment

Leading the way in environmental sustainability for the industrial inkjet technology sector.

#### 2. People

To be employer of choice by putting our people, their potential and well-being at the heart of all we do.

#### 3. Innovation

Encouraging more sustainable approaches to design, manufacture, technology and collaboration across the whole product lifecycle.

#### 4. Community

Actively engaging with our communities to provide practical, lasting support that benefits society.

 [The full sustainability strategy and roadmap can be found on pages 29 to 37](#)

#### Employee engagement

We hosted a number of COVID-19 safe lunches for our employees to encourage collaboration and team building, as well as to help new employees meet the wider team. In July we held an employee event to officially open our new Corporate HQ and bespoke R&D lab at the Cambridge Research Park.

We have also been working on embedding our values more into our culture. A cross functional project team developed an easy to remember logo for our values, launched a new values award which runs across the whole Group and developed a new video which we are using for employee engagement, recruitment and induction.

 <https://youtu.be/4rXmXMLEpgg>

 [Read more about our values on page 5](#)

In addition, we have introduced packs for key employee occasions: new starter packs, new baby packs and an anniversary card to mark certain milestones (first year, five, ten, 20, 30 years).

#### Supporting local charities

Our employees nominated two charities and each received a donation of £2,000, with the beneficiaries being the Special Care Baby Unit at Hinchingsbrooke Hospital in Q1 2021 and Wood Green, The Animals Charity in Q4 2020.

Later in the year we fund-raised for Break Charity ([www.break-charity.org/charity/](http://www.break-charity.org/charity/)). As well as sponsoring their Cows about Cambridge Farewell weekend, Xaar employees hosted a stand at the event and raised £150 by selling for a £1 donation colourful miniature cows that we had 3D printed.



*Our focus on customers and a product roadmap that reflects current and potential customer needs has increased the quality and responsiveness of the business, and means we are well placed for further performance improvement.*

# Leading the way with our strong partnerships

**In my first report as Chairman two years ago, I spoke of my confidence in the new leadership team and in our ability to turn the business around after the challenges encountered in 2019. At the end of 2021 and following a period of unprecedented uncertainty surrounding the COVID-19 pandemic, I am pleased to report good progress continues to be made.**

Our fundamental focus has been on Xaar's core competence in design and manufacture of world leading printheads, whilst rebuilding and strengthening all areas of the business to better serve our customers and deliver consistent and reliable business performance.

There has been a realignment of our go-to-market approach with a clear focus on the value chain and our customers, a strengthening of our senior leadership and functional teams, a revitalisation of our brand and corporate identity and, importantly, a focus on the technical and competitive advantages of the Xaar bulk piezo product range.

The introduction of our new ImagineX bulk piezo platform has created a pipeline of new product developments with the first two products, Nitrox and Irix, launched during 2021.

The Board is pleased with the progress that the management team has made in re-energising the business and would also like to thank our teams worldwide for their commitment and adaptability, particularly across our supply chain, during this period of uncertainty.

### Strategic progress

We have continued to embed our strategy across the Group and through our people: a key enabler of the strong performance in 2021. Our focus on customers and a product roadmap that reflects current and potential customer needs has increased the quality and responsiveness of the business, and this means that we are well placed for further performance improvements. We believe a significant opportunity exists in market sectors and applications where Xaar technology provides commercial and technical performance advantages and that is our focus.

During the year, our ability to serve customers was further advanced through the acquisition of FFEI, adding both capability and capacity whilst enabling a more vertically integrated approach to assisting customers with the adoption of digital print technology. In November 2021 we completed the sale of our stake in Xaar 3D to our partner Stratasys, further strengthening our balance sheet whilst retaining a strong commercial partner in the 3D market.

We recently (March 2022) strengthened the business further with the acquisition of Megnajet, a leader in design and manufacture of ink delivery systems. Megnajet adds complementary skills to Xaar's core competence as we build the capability to provide customers with a more complete package of integration tools and accelerate the adoption of Xaar printhead technology. We welcome the Megnajet team to the Group.

### Financial results

In what has proven to be another challenging year for the global economy, the Group has delivered sales growth of 23% and moved back into profit in the second half of the year. Actions have been taken to build management and organisational strength, while cost control and careful cash management demonstrate our clear focus on performance and a return to profit.

The Printhead business has made good progress both commercially and operationally. Sales volumes have grown and a programme to improve efficiency and consistency of operational performance is progressing well. A specific area of focus has been our supply chain and our response to the challenges caused by the pandemic. An early recognition of the potential constraints on supply and logistics enabled us to secure materials to meet expected production requirements, and to proactively adapt product designs to accommodate alternative components.

## Strategic and operational highlights

- + Re-alignment of our go-to-market approach has strengthened customer engagement
- + Strong performance for the Printhead business with consistent wins of new customers and projects and renewed focus on markets where products have a competitive advantage
- + Ongoing delivery of product roadmap with two successful product launches from our ImagineX platform
- + Investment in working capital has allowed Xaar to successfully mitigate supply chain constraints and secure ability to deliver on customer demand
- + Further operational progress made in Engineered Printing Solutions (EPS), delivering strong revenue growth
- + Relocation of Cambridge office during 2021 will result in £0.7 million annualised cost saving
- + Acquisition of Megnajet to provide customers with a more complete package of integration tools
- + Successful integration of FFEI acquisition expanding business capability and vertically integrated product offering
- + Completion of divestment of Xaar 3D investment
- + Launch of Sustainability roadmap with clear strategy to reach 'net zero' by 2030.

These actions have increased business resilience and will help us maintain uninterrupted supply to customers during 2022.

After encountering weaker demand and challenges in EPS, during the first half of the year, the appointment of new leadership and a realignment of strategy led to a much stronger second half of the year with sales 25% higher than in the first half. While performance for the year as a whole was impacted by previously announced non-cash adjustments relating to slow moving and obsolete inventory, there is good momentum in the order book and operational performance is improving in EPS.

We are pleased with the progress made at FFEI. Having only joined the Group in July 2021, integration of the technical teams is largely complete, and performance is in line with our expectations.

Good underlying cash flow and receipts from the sale of our stake in Xaar 3D in November 2021 enabled the Group to close the year with a robust balance sheet. Net cash of £25.1 million provides a platform for further investment and further complementary acquisitions.

The Board has not declared a dividend in 2021 as we believe that prioritising cash for continued investment in the business at this stage of our rebuilding programme will deliver more compelling returns for shareholders in the medium term.

### Environment

As a Board we consider our responsibility to the environment and society in general as an integral part of running a successful business. We are mindful of, and are committed to, the need to be good custodians of our natural resources for future generations. The business has established an ESG Committee with oversight and input from the Board and

has committed to a Sustainability Roadmap including ways in which we will strive to provide solutions and products for our customers that are cleaner and healthier. We are in the process of defining and setting meaningful ESG targets alongside plans of how we will achieve those targets in a specific time frame. Our goal is for the business to be 'Net Zero by 2030'.

### People

For Xaar to be successful we need the energy, commitment and engagement of all our employees. Periods of 'lockdown', remote working and constraints on how people interact have all presented challenges, but I have great admiration for the way in which our people have overcome these challenges and worked tirelessly developing a strong 'can-do' culture.

We entered the year with optimism and a renewed sense of purpose but of course still uncertain as to the wider economic environment and extent of the challenges that would present. Despite this backdrop we have pushed on with the necessary changes to the business and it is to the great credit of the whole team at Xaar, in all businesses and in the many countries around the world where colleagues live and work, that they have adapted, committed to and succeeded in delivering both solid financial results and a platform for continued growth. On behalf of the Board, I thank them and congratulate them on the progress made.

### Summary

The Board is optimistic following our progress this year and is confident in the future prospects of the Group.



**Andrew Herbert**  
Chairman  
29 March 2022

## Our EPIICC values



### Everything with Passion

We care about our technology, our products, our partners and each other.

### Innovative

We always look for new, better solutions.

### Integrity

We deliver on our promises.

### Creative

We push the boundaries of what's possible.

### Collaborative

We work together as a team and with our clients.

### Our values are the driving force of our culture and are at the heart of everything that we do.

We have a cross functional team that has been working on ways to further embed our values throughout the Company, and we have also rolled the values out across all the Group. The team put together a video which demonstrates the part that our values play in our lives, both at work and in our home lives.

 [Read more about our Company culture on page 9](#)



 [Watch our video at https://youtu.be/4rXmXMLEpgg](https://youtu.be/4rXmXMLEpgg)



# WE ARE READY FOR THE FUTURE

# Six reasons to invest

# 1

## Market opportunity

We focus on markets where we have a competitive advantage, where we can offer a number of benefits over incumbent technologies. For example, with Direct-to-Shape printing, Xaar technology offers unique value thanks to the capability of our printheads to print dynamically, in multiple orientations. This is particularly relevant in a number of areas from aerospace to bicycle manufacture.

In addition, Xaar continues to see a growing number of new opportunities within the 3D printing markets. Our technology is unique in its capability for managing high viscosity fluids and at the same time delivering industrial levels of reliability across a range of additive manufacturing applications and emerging technologies.

There are significant opportunities in textile printing, particularly in applications using pigmented inks. Xaar's technology is well suited for the challenges of printing highly pigmented inks, providing several USPs, and when combined with upcoming products from ImagineX, will bring a significant value proposition to that market.

 [See Marketplace on page 10](#)

# 2

## Proven technology and product roadmap with a strong value proposition

We have a product roadmap based on our new generation ImagineX technology platform that will develop our range to offer advantages over the competition and open new markets. Our unique technologies and products are the leading enabler for innovation and creativity, and for driving production efficiencies for many industries.

 [See more on pages 20 and 21](#)

# 3

## Experienced and focused management team

As the only leading independent printhead manufacturer we are able to have a flexible, collaborative approach. Our experienced management team is committed to remaining customer-centric with a focus on Xaar's growth strategy of offering a more vertically integrated solution.

 [See Board biographies on pages 60 and 61](#)

# 4

## A clear strategic vision

We have a customer-centric business model that places the OEM and UDI at the heart of everything we do. We are executing on our plan to become more vertically integrated to drive printhead sales. Our ability to supply electronics, software, ink systems and print engines alongside application support, combined with a disruptive technology, sets us apart from our competition.

 [See Our business model on page 8](#)

# 5

## Roadmap to deliver the opportunities

Our ImagineX printhead platform (launched September 2020) is driving our progress, enabling the business to increase its addressable markets whilst establishing market leading products across all our sectors. ImagineX has already delivered significant enhancements to the current portfolio; these include substantially improved speed and throughput as well as high throw distance and viscosities of over 100cp at jetting temperature. We have already launched two new printheads on this platform (Xaar Nitrox and Xaar Irix). Future product launches include aqueous compatibility, increased robustness to improve the life of the printhead and even higher resolutions. These features are helping to strengthen our position in markets where we are already well represented and will drive improved adoption in several markets where we are currently not, such as Wide Format Graphics, Labels, Packaging and Textiles.

 [See New opportunities on page 3](#)

# 6

## Strong balance sheet position

We have the resources necessary to implement our strategy; a strong balance sheet with no debt and net cash of £25.1 million. This provides the platform for security and a great foundation for future growth.

 [See the Strategy update on page 12](#)

# Our business model

**Xaar's business is focused on inkjet technology, which together with our partners and customers, we have been transforming for over 30 years.**

**Xaar plc is structured into business units: Xaar Printhead, the largest BU, focuses on printhead technology; our other two business units concentrate on product print systems and digital imaging.**

Our printhead business sells our inkjet technology in component form (the printhead, branded Xaar) to OEMs who produce and sell the complete digital printing solution. We also work with User Developer Integrators (UDIs) who are building their own digital system. We work collaboratively with leading fluid manufacturers to fully optimise the fluids beyond a lab setting to ensure optimum print performance in real world applications. We also sell Xaar branded fluids to UDIs (manufactured by our ink partners) which helps to build a long-term relationship with our customers. In addition, we actively partner with hardware and software integrators as well as substrate suppliers to deliver a robust and attractive total solution to our customers.

Our product printing business, EPS, designs and develops complete industrial printing machines which are sold to end users.

Our digital imaging company, FFEI Ltd, manufactures high performance digital imaging solutions – from digital inkjet label presses to digital pathology scanners. Its inkjet products (print engines) use Xaar printheads.

In March 2022 we completed the acquisition of Megnajet, market leader in the design and manufacture of industrial ink management and supply systems for digital inkjet.

We have recently sold our remaining interest in Xaar 3D (which is developing 3D printing machines) to Stratasys.

## Our business model

### Xaar designs



We have R&D facilities in Cambridge, Hemel Hempstead, Stockholm, and Vermont.

We invest a substantial proportion of our revenue in R&D to remain a world leader in inkjet technology (2021: approximately 10%).

We continually add to our Intellectual Property ('IP') portfolio, and currently we have around 340 patents and patent applications.

Our R&D staff totals 86 which is 21% of the total workforce.

### Xaar manufactures



Xaar manufactures its printheads in Huntingdon, UK. Xaar's manufacturing is capital intensive. The Group has invested over £70 million in assets and production facilities in Cambridgeshire, UK since the plant opened in 2007.

EPS, our product printing business, manufactures customised and bespoke printing solutions in Vermont, USA.

FFEI, our digital imaging business, manufactures imaging solutions in Hertfordshire, UK.

Megnajet manufactures ink management and supply systems in Northamptonshire, UK.

### Xaar markets



Xaar offers a wide range of industrial inkjet printheads and print systems which are designed and produced to meet the customer-driven requirements for a range of manufacturing applications.

Primary markets include:

- 3D Printing
- Ceramic Tile Decoration
- Coding & Marking
- Decorative Laminates
- Direct-to-Shape
- Functional Fluid Deposition
- Glass Printing
- Graphics
- Primary Labels
- Packaging
- Product Printing.

### Xaar sells



Xaar's printhead business sells direct to OEMs and UDIs around the world through its global sales team. Xaar's highly skilled application engineers offer technical support to assist OEMs and UDIs in the successful design, build, commissioning, and ongoing maintenance of printing systems. We export over 95% of our printheads to customers around the world, within Europe, Asia and North America regions.

Xaar company EPS also sells product printing equipment, services and consumables. The majority of sales are to US customers.

FFEI sells via three routes to market: as a full system to one OEM, as a ready to integrate print engine via distribution, and as a Xaar branded print engine for our UDI customers.

Megnajet sells its products directly to customers and via Xaar.

## We create value for all our stakeholders

### Customers

OEMs, User Developer Integrators and end users are able to innovate in their manufacturing methods and their products as well as benefit from a shorter distribution chain; they can take products to market more quickly, implement more precise and efficient processes, easily produce short batches, improve productivity, reduce waste and deliver more creativity.

### Shareholders

A key goal at Xaar is to maximise the long-term growth in value delivered to shareholders via sustained, consistent growth in earnings per share. This is delivered through continued investment in R&D and producing a pipeline of new products which deliver a sustained return on capital employed.

### Our employees

Our success depends on the capability and engagement of our people. We want bright and driven people who share our values and passion for developing and manufacturing world leading technology. We are building a culture where our employees are passionate about what they do, and where integrity, innovation, creativity and collaboration are a way of life. We like to build long-term relationships with all our employees by helping them grow and develop – in 2021 we promoted over 70 people – and by making Xaar an interesting place to work as well as a great company to be involved with.

Whilst this year we continued to manage the impact of COVID, we were able to host a number of COVID safe lunches for our employees to encourage collaboration and team building, as well as to help new employees meet the wider team. We also focused on embedding our values more deeply into our culture which has included launching a new values award across the whole Group.

We have also continued with forums where employees have the opportunity to meet and chat with all our Non-Executive Directors along with the Exec Xchange where our employees get to meet members of the senior management team in smaller groups to ask questions and exchange ideas.

### Environment

Digital print methods are inherently more environmentally friendly than the analogue techniques we seek to replace. Our research shows that, compared to analogue alternatives, digital has a huge impact in reducing energy consumption (by up to 55%), water consumption (by up to 60%) and CO<sub>2</sub> emissions (by up to 95%), but also in reducing pollution and waste materials. Xaar is committed to reducing its impact on the environment wherever possible. Our actuator technology consumes less energy than competitor alternatives and our industrial printheads can remain in use for many years. In addition, we use a continuous improvement methodology and we have adopted a manufacturing ethos of 'reduce, reuse and recycle'.

Environmental best practice and our investment in sustainable manufacturing and operational efficiencies remain key areas of business focus. Notable outcomes during 2021 include a move to 100% certified renewable energy tariffs at three of our UK facilities – a switch that will make a valuable contribution to our net zero goals. We completed this move for two remaining facilities in January 2022. One key decarbonisation project that has commenced in 2021 is the installation of EV charging infrastructure. Work on moving to solar energy continues, with other factory level energy efficiency improvements ongoing.

In the second half of 2021 we formed an ESG Committee with governance and accountability to the Board. Reporting to the ESG Committee, the Sustainability team, formed with representatives from across the business, has developed a co-ordinated Sustainability Roadmap that will push Xaar towards its 'Net Zero by 2030' goal. The Roadmap has four key pillars – Environmental, People, Innovation and Community; its purpose is to drive our ESG goals beyond the Energy Reduction scope to a Group wide activity. Once approved at Board level, the Roadmap will provide an essential backbone for much of Xaar's future investment and activity.

Digital printing compared to analogue reduces consumption of up to:

**95%**

CO<sub>2</sub> emissions

**55%**

Energy consumption

**60%**

Water consumption

Source: Xaar.

# Xaar's digital inkjet technologies are transforming print processes in a wide range of markets.

## Industrial markets

### Ceramic Tile Decoration

The majority of the tile decoration market uses digital inkjet technology because, compared to traditional analogue techniques, it is superior in terms of image quality and is lower in cost. In addition, it offers the advantages of flexibility, inventory reduction and larger tile size capability. This is a mature market for Xaar with strong competition. However, with an average useful life of five to six years, several hundred new ceramics printers are required each year for the foreseeable future. Xaar's unrivalled 720 dpi print resolution is starting to attract the attention of tile manufacturers looking to print large slabs for kitchenware (such as table tops).

### Decorative Laminates

Realistic wood finishes or creative design are the key features which sell the board/plank/finished item. The digital quality that can be produced with Xaar printheads matches the quality produced by the analogue process, thereby offering the opportunity for more economic short run work to be undertaken whilst reducing inventories and improving time-to-market.

### Functional Fluid Deposition

Xaar's focus on functional fluid promotes our inkjet technology, which offers an unrivalled method of non-contact, fluid deposition with incredible precision, control and speed. Typically applications are challenging, pushing our technology to and beyond known limits in markets such as Flat Panel Display, Semiconductors, Printed Electronics and Optics.

### 3D Printing

3D Printing is a manufacturing methodology that encompasses a range of processes and applications, with a common theme of building parts up, usually layer-upon-layer. This additive approach ultimately enables manufacturers to eliminate the need for tooling. There are significant advantages, including superior geometric freedom, giving designers much more capability, and a substantial reduction in lead time for products. In addition 3D Printing provides the facility to tailor unique products to consumers, enable de-centralised manufacturing and shrink spare part storage.

### Glass Printing

Architectural glass is increasingly used to complement ceramic tiles in modern commercial design, and is starting to be used in residential projects also. Functional glass, such as car windscreens or glass tops used in induction hob cookers, is predominantly printed using analogue screen techniques, but is increasingly moving to digital to provide production flexibility and inventory reduction. This is an emerging sector for digital inkjet and the Xaar 2002 is the leading printhead for this market due to technology advantages.

## Packaging markets

### Coding & Marking

Coding & Marking is an application which relates to printing product identification codes such as batch numbers, use by dates and barcodes. Xaar's technology is used to print barcodes and logos on outer case/secondary packaging of consumer goods. This is an established and stable business, and competes with alternative technologies including print and apply, and thermal inkjet.

### Primary Labels

Labels are used for many different applications, including product identification, name tags, warning and hazard identification, promotions and as decals for product decoration. There is a large range of substrates and inks in this application which adds complexity to the conversion process. Xaar excels in two areas of label printing: colours (including white) and varnish based finishing effects using Xaar's High Laydown Technology.

### Direct-to-Shape

Direct-to-Shape is the application where bottles and containers have the image printed directly onto their surface without the need for a label. The solution is aimed at reducing unit costs versus the application of a label. This approach can also be used as part of the identity of a brand, and provides differentiation versus other products that use paper or plastic labels. Xaar printheads are the best at printing in a vertical mode (a frequent requirement for these applications), thanks to TF Technology.

## Other markets

### Product Printing

Product Printing covers printing onto all kinds of industrial objects, including consumer and promotional items, packaging, medical, automotive, apparel, appliances, sports equipment and toys. Xaar's printheads are particularly suitable to these applications because the printhead design enables the use of a wide range of fluids as well as configurations options. In addition, Xaar company Engineered Printing Solutions (EPS) is a leader in this sector, providing best-fit custom printing solutions for many different applications, including promotional, packaging, medical, automotive, apparel, appliances, sports equipment and toys.

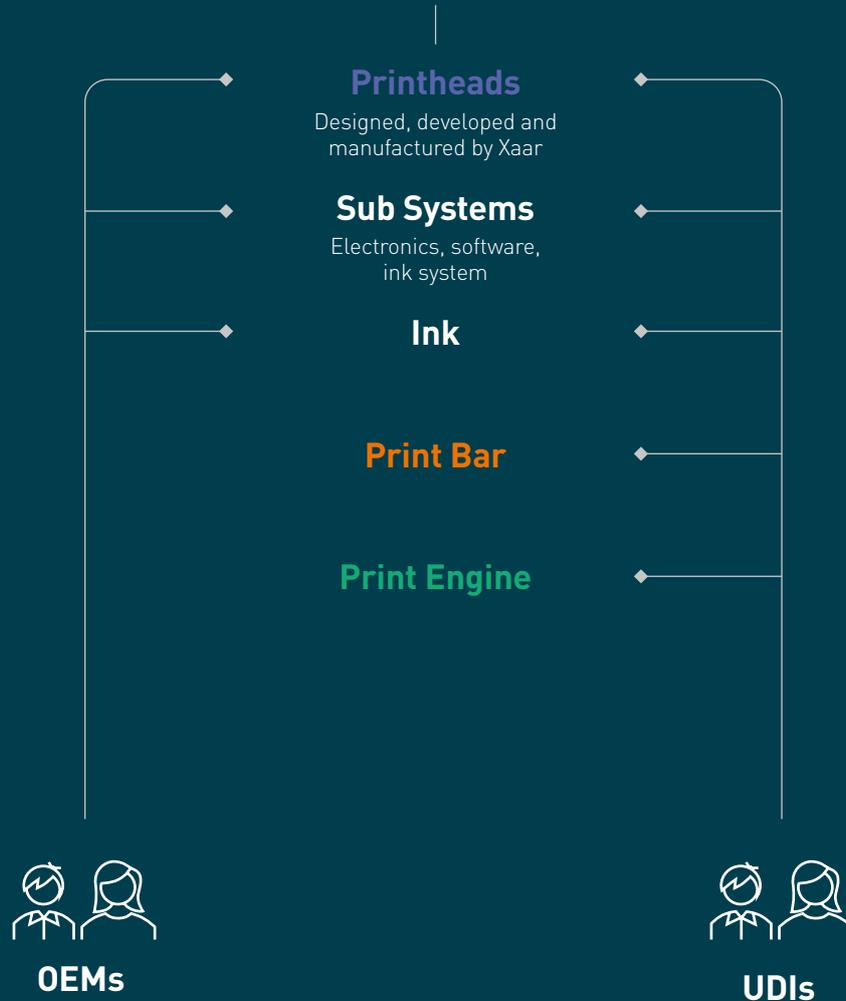
### Grand- and Wide-Format Graphics

Grand- and Wide-Format Graphics includes both indoor and outdoor signage and advertising, including billboards, posters and point of sale advertising. It is the most mature industrial inkjet market, active for over 15 years. Xaar's early product range was instrumental in the growth of the digital graphics industry around the world.

### New inkjet applications

Xaar's Ultra High Viscosity Technology enables jetting of fluids around 100 centipoises (cP) at jetting temperature, equating to approximately 1000cP at ambient temperature – going well beyond average jetting capabilities of 10-12cP. This opens up inkjet to a wider range of applications including printing adhesives and solder masks.

# Strategy at a glance



## Strategy at a glance

The principal focus of our strategy is selling printheads. We can do this more effectively by providing an integrated service to our UDI and OEM customers. Their success depends in part on a cost effective product development process, getting their products successfully and quickly to market, and maintaining product stability throughout the product lifetime.

Customers who have less experience of inkjet development projects, such as the User Developer Integrators, or OEMs moving into a new application area, are looking for a dedicated, experienced inkjet partner for printheads, sub systems (electronics, software and ink supply systems) and ink, as well as for print engines right up to fully customised solutions.

We are therefore focused on providing an integrated solution whereby our customers can access more of the printing ecosystem (the supporting elements such as ink supply systems and the electronics required for printing) – as well as the print technology (the printheads). This strategy will ultimately ensure we sell more printheads.



# Enhancing our integrated product offering

## Introduction

**We are now two years into the turnaround of Xaar and we are extremely pleased with what we have achieved. We have implemented a new strategy across the business, with a new commercial model whilst investing in the business. This has seen significant progress as old customers have returned and new customers are continuing to engage with us. The speed with which this has been achieved is impressive and we have proved our strategy is working.**

We have also made great progress updating our infrastructure and further strengthening the team, our products and the capabilities to deliver growth in the business. Operationally we have strengthened the business, improved our efficiency and margins whilst continuing to build a sustainable solid platform from which to grow the business further. During the year we successfully integrated FFEI, which will enhance our commercial offering and widens our product technology offering.

We have also established an ESG Committee and committed to our Sustainability Roadmap which will become further embedded in the business and be visible in everything we do as a business.

Xaar has achieved much in the last two years and this success will help drive us further in the coming years.

## Delivered good results and finished the year well

The results for the year demonstrate significant progress for the business and we are extremely pleased with the continued strong performance which, despite challenging market conditions, demonstrates the positive momentum our strategy is driving throughout Xaar. Investment in capability and capacity provides us with further opportunities to accelerate our strategy and future growth. This leaves the business well placed to capitalise on this performance and deliver further growth and a return to profitability. Delivering profit on an adjusted basis over the second half of 2021 is a key landmark achievement for the Group. It is a milestone which has been achieved quicker than planned as part of the turnaround.

### Revenue growth

Revenue for the year was £59.3 million, representing an increase of 23% relative to 2020. Organic growth before the effects of the acquisition of FFEI was 12%.

In the Printhead business we have a clear customer-focused commercial model strategy which is reaping rewards, delivering revenue growth of 14%. This approach includes removal of distribution channels, a clear pricing strategy, and a sales process that is focused on selling the printhead based on its technical merits.

The focus has been on markets where our technology has a competitive advantage and working with the customer, both Original Equipment Manufacturers (OEMs) and User Developer Integrators (UDIs), over the entire product lifecycle to reduce their development times and, therefore time to market, and to also provide improved aftersales support. We continue to see increased customer engagement both from existing as well as new customers.

The product roadmap delivered two new products during 2021 – Xaar Nitrox and Xaar Irix – that has broadened the Bulk printhead product range to offer advantages over the competition in existing and new markets.

Revenue growth in Asia, especially China, has been significant, up 33% year-on-year, with ceramics and glass customers particularly re-engaging, increasing our market share. Revenue growth in this sector in the year was 38%.

Product Print Systems business 'EPS' delivered improved performance demonstrating strong revenue growth of 9%. This follows the effective implementation of operational changes and progress in developing a modular approach to products. As previously announced the 2021 results were impacted by non-cash adjustments relating to slow moving and obsolete inventory following the implementation of planned process improvement and strategy. This impacted the gross profit negatively by £0.7 million of provisions and write downs.

Digital Imaging delivered revenue of £5.3 million in the period from acquisition on 11 July 2021.

#### Improved margins and returns

This strong revenue growth, coupled with our increased operational efficiency, saw the gross margin increasing to 34% in 2021 (2020: 27%). We have invested in our capability and efficiency most notably in Operations and support functions but have continued to exercise discipline in our cost management actions.

Accordingly, we can report a much reduced adjusted loss for the year of £0.6 million, compared to £3.9 million last year, and crucially we can report an adjusted profit for the second half of the year.

Pleasingly we can report positive adjusted EBITDA in each of our businesses, which is a notable step towards full year profitability for the Group.

#### Strong balance sheet

The Group retains a strong balance sheet and cash position. Net cash at 31 December 2021 was £25.1 million. This represents an improvement of £7.0 million in the year. This has been primarily driven by the £9.3 million initial consideration received for the Xaar 3D divestment and continued strong cash generation in our Printhead business. We have taken the opportunity to invest in inventory of £9.1 million in the year to successfully secure materials to meet expected 2022 production requirements and to increase our holding of finished goods.

This gives us greater assurance that we can deliver on customer demands throughout 2022. We have taken further proactive actions to adapt product designs to accommodate alternative components, increasing our resilience to supply chain constraints.

#### On track with our journey, plan and strategy and more confidence in our capability

During the last two years we have successfully re-set the Group with a new business model and established a robust platform to deliver profitable growth. The turnaround is now at the end of the first phase, we have established a clear strategy and we are ready for the next stage to achieve sustainable profitable growth.

The first phase focused on stabilising the business and establishing a clear strategy. Commercially this has seen the Printhead business reduce complexity in its routes to market by eliminating third party distributors and selling directly to OEMs and UDIs. Our principal strategy is to provide an integrated solution for customers whereby they can access more of the printing ecosystem, to include supporting elements such as ink supply systems and the electronics required for printing. We help our customers take advantage of the Inkjet opportunity and working with Xaar means a higher chance of success by being faster to market, making our customers' investment more profitable.

This approach has seen us deliver a more vertically integrated product offering to a wider group of customers in more market sectors.

#### Refreshed customer engagement

Accordingly, we have regained customers, particularly in core sectors such as Ceramics and Glass, and we now have significant market opportunities in 3D, Coding & Marking and Direct-to-Shape. Our 2021 revenue in the ceramics and glass sector has increased by over 40% since 2020 and the number of OEM projects commissioning Xaar products has doubled year on year for each of the last two years.

Our commercial approach has also been updated with new branding and a fresh, clear communication plan which has helped to regain the trust of OEMs, making sure the advantages of Xaar technology are well understood. The level of engagement from lapsed and established customers and our desire to listen to their needs and to work with them to find a solution, through consistent communication, indicates this has been working and we are regaining their trust.

### Financial highlights

# £59.3m

#### Revenue – Continuing operations

in line with management expectations (2020: £48.0 million)

# 34%

#### Gross margin – Continuing operations

increased from 27% in 2020, benefiting from operational leverage in the business

# £5.7m

#### Gross R&D spend

by continuing operations of £5.7 million, up £1.2 million on 2020 with investment focused on the ImagineX platform and product roadmap

# (£2.3m)

#### Net cash outflow

Net cash outflow from continuing operations before Xaar 3D disposal proceeds (2020: £7.1 million inflow)

# £9.3m

#### Cash inflow on Xaar 3D disposal

Initial cash consideration received, with a further £10.9 million contingent consideration

# £25.1m

#### Net cash

Strong closing balance sheet with net cash and treasury deposits (2020: £18.1 million excluding Xaar 3D)

Xaar's position in the 3D business is one of technology enabler and our end goal has been, and remains, to supply printheads for use in 3D applications and not become an OEM in the sector. That was the rationale behind our partnership with Stratasys, a recognised leader in 3D with a proven track record and strong routes to market. On 1 November 2021 we sold our remaining stake in Xaar 3D to Stratasys, and we will continue our relationship with them as a supplier of printheads.

### Vertically integrated product offering

The acquisition of print systems and printbar specialist FFEI in July 2021 further widens our product offering for our OEM and UDI customers with a broader product range including print engines for adding effects and embellishments digitally. FFEI has been successfully integrated and strengthens Xaar's capabilities and skills. This will accelerate Xaar's existing growth strategy and widen the product portfolio, further engaging UDI customers. We have a growing pipeline with a significant number of opportunities thanks to our technology advantages. This will give us further opportunities for additional vertical integration, and we continue to strengthen our offering with more products in the pipeline for 2022.

Our product roadmap, built on the ImagineX platform, has already delivered significant enhancements to the current portfolio with two products, Xaar Irix and Xaar Nitrox, launched on time during 2021.

Our EPS business performed well, increasing revenue and margins on an underlying, ongoing basis. The non-cash adjustments made in the year were necessary to rebase the business and ensure a strong financial platform from which to drive further growth. In addition, we changed the leadership of EPS and embedded the more efficient modular operational approach which will enable further margin growth. With increased control, focus and a more precise commercial approach EPS is well placed to deliver sustainable margin growth in the coming years.

### Operational capability

We have made significant progress in building a world class leadership team, making some key appointments during the year which will drive the business in the next phase of our transformation. This has strengthened our capability and experience across the business, most notably in our Operations, Finance, Human Resources, and EH&S Management, as well as re-organising the sales team. This increase in operational support includes further investment in infrastructure such as IT, manufacturing and supply chain management.

During the year we established new corporate headquarters in Cambridge, UK and focused our Printhead operations into our main manufacturing facility in Huntingdon, UK. We also opened a new Customer Service Centre in Shenzhen, China. These changes give the benefit of increased efficiency in how our teams work together, providing us with a better way of working more closely and collaboratively with our customers across the world and will deliver £0.7 million of annualised cost savings.

We are proud of how our teams have continued to respond to the difficulties presented by COVID-19. We have proven the business can operate effectively with greater efficiency whilst building greater business resilience.

During the year we have worked on embedding new values into our culture. This is an important step in changing the mindset and culture of our business and has seen employees show engagement and empowerment. A cross functional project team developed an easy to remember logo for our values, launched a new values award, which is embedded across the Group, and developed a new video which we are using for employee engagement, recruitment and induction.

### Sustainability

We established an ESG Committee during the year, constituted by a cross functional internal team and supplemented with external expertise. This group, formed from representatives from across the business, has developed a co-ordinated Sustainability Roadmap that will push Xaar towards its goal of 'Net Zero by 2030'. The Roadmap has four key pillars:

1. Environment
2. People
3. Innovation
4. Community.

Its purpose is to drive our ESG goals beyond the Energy Reduction scope to a Group wide activity and provide an essential backbone for much of Xaar's future investment and activity. It has the full backing of the Board and is sponsored by Alison Littley, Senior Independent Director.

Digital inkjet printing is inherently more sustainable compared to traditional analogue printing with a smaller carbon footprint. It reduces and prevents excessive waste and uses less energy due to the ability to print short runs or Direct-to-Shape. With TF Technology ink recirculation, Xaar printheads are capable of printing very viscous fluids reducing the need for energy intensive drying processes. We are passionate in continuing further adoption and understanding of the environmental benefits our products can bring to customers.

### Product development and increased capability

In aggregate the market size across these sectors is huge. We have a unique roadmap of product development to ensure we offer an increasing vertically integrated commercial strategy to capitalise on this market opportunity. The ImagineX platform will deliver a number of features over the next few years which will provide significant enhancements to the current portfolio; these include:

- Substantially improved speed and throughput (frequencies up to 150kHz, equivalent to a threefold increase in speed compared to current products)
- Aqueous compatibility
- Increased throw distance to improve image quality on curved surfaces
- Increased robustness to improve the life of the printhead and maintain image quality
- Higher viscosities enabling a broader range of fluids to be printed (above 100cP)
- Higher resolutions (up to 1440 dpi).



*We have made strategic acquisitions to the Group that enable us to strengthen our customer offering and we will continue to adopt this approach in the future as we look to continue increasing our capability and become a fully integrated inkjet product provider.*



These features will help strengthen our position in markets where we are already well represented and will drive improved adoption in several markets where we are currently not, such as Wide Format Graphics, Labels, Packaging and Textiles. The performance enhancements in our product roadmap give a clear path for OEMs to upgrade their products and maintain their product differentiation.

Development of our aqueous product remains on track, and we intend to release more details on this later in the year. The exciting opportunity this product provides is significant as we would have an unrivalled portfolio that could satisfy market demands which we are currently not able to due to our printhead architecture.

We have made strategic bolt-on acquisitions to the Group that enable us to strengthen our customer offering and we will continue to adopt this approach in the future as we look to continue increasing our capability and become a fully integrated inkjet product provider.

The actions taken in the last two years leave us with a strong balance sheet. The strong operational gearing that exists in the business, which has already delivered good margin growth, has greater capacity to support further margin improvement in the medium term. The business is well placed to move into the next phase of its transformation and to deliver sustainable profitable growth in the medium term.

#### Significant opportunity

Xaar's digital inkjet technologies are transforming print processes in a wide range of markets, and the medium- and long-term opportunity for the business remains significant.

We have already grown market share in core, mature markets such as Ceramics & Glass and Coding & Marking. There remains further growth opportunity in these areas as our technology is best in class and we have a clear competitive advantage over our competitors due to our core technologies (TF Technology ink recirculation, High Laydown Technology, Ultra High Viscosity Technology).

Increased market opportunity exists in sectors that are looking for further digitisation of printing on which we can capitalise. We see opportunities typically in areas where fluid applications are challenging, such as Flat Panel Display, Semiconductors, Printed Electronics and Optics. We are well placed to succeed in these markets as Xaar technology offers an unrivalled method of non-contact, fluid deposition with incredible precision, control and speed.

Other markets that already use digital printing such as architectural glass printing and 3D printing are tremendously exciting as our technology has unique benefits that can give our customers commercial advantage in reducing costs and lead times for their products.

#### Outlook

The positive momentum in the business has continued in the first quarter of 2022 and we remain optimistic about the short-term outlook for the business. Customer engagement and sales orders have been maintained in quarter 1 and are in line with our expectations. We anticipate continued performance improvements during 2022 with further good organic revenue growth.

Due to the action taken to secure supply by investing in working capital during 2021 we believe we are well placed to satisfy customer demand for the year ahead and we have the supply chain resilience to withstand most disruption. We are continuing to invest in the business, adding skills, capability and capacity.

We expect an improved gross margin which will come from the continued efficiency gains we have in the business. Whilst that enhancement won't be at the same incremental increase as for 2021, we are confident of returning to 40% gross margins in the medium term.

Whilst we are conscious of the continuing risks arising from the economic consequences of wider global issues, and COVID-19 continues to be a risk to economic disruption, particularly in Asia, we remain on track to return the business to profitable growth and look forward to the future with confidence.

We have the right strategy and remain confident in our ability to achieve our target of a full year profit this year.

**John Mills**  
Chief Executive  
Officer

29 March 2022

**Ian Tichias**  
Chief Financial  
Officer

29 March 2022

## Our business units

Xaar plc has a number of business units within the Group, with the principal focus being on inkjet technology.

## Printhead

Our Printhead business unit focuses on the design, manufacture, marketing and sales of printheads and associated products which are used in a variety of applications such as Ceramic Tile Decoration, Graphics, Décor, Labels and Packaging as well as 3D Printing and Additive Manufacturing.

### Revenue segment



### Markets

● Industrial	53%
● Packaging	30%
● Graphic Arts	15%
● Royalty	2%

## Product Print Systems

Product Print involves printing all kinds of industrial and promotional objects such as medical equipment, automotive parts, tools, apparel, appliances, sports equipment and toys. Xaar company EPS manufactures and sells a range of highly customised print systems for these applications, including some using Xaar's inkjet printheads.

### Revenue segment



### Markets

● Digital	58%
● Analogue	39%
● Other	3%

## Digital Imaging

Our digital imaging company, FFEI Ltd, focuses on high performance digital imaging solutions – from digital inkjet label presses to digital pathology scanners.

In March 2022 we acquired Megnajet, market leader in the design and manufacture of industrial ink management and supply systems for digital inkjet. The acquisition is part of our strategy to offer our customers a more integrated inkjet solution.

### Revenue segment



### Markets

● Inkjet	60%
● Life Sciences	40%

## 3D Printing

We have recently sold our remaining interest in Xaar 3D to Stratasy (see Financial Statements – note 11, page 137). Xaar 3D is developing, manufacturing and commercialising 3D printing machines with a unique 3D printing technology. The sale to Stratasy will enable Xaar 3D to succeed with their go-to-market plans.

In addition, we have developed a close relationship with Stratasy for future collaboration and ongoing supply of printheads.

We continue to work on other 3D printing projects which use Xaar printheads to deliver alternative 3D printing technology.

**£9.3m**

Cash proceeds received

**£17.9m**

Gain on sale of investment

**£10.9m**

Fair value of contingent consideration on disposal

**(£246k)**

Transaction costs on disposal



# DELIVERING ON OUR STRATEGY

## 2021 summary

### Product launches

The Printhead business continues to perform well with a growing pipeline of new product developments coming from the ImagineX printhead platform.

In April we launched the Xaar Nitrox to deliver greater print speeds (up to 100 metres per minute) and uniformity for unparalleled performance across a wide variety of print applications. By the end of 2021 we already had 23 projects using the Xaar Nitrox in progress, covering more than seven different application sectors.

We also launched the Xaar Irix in September. This printhead is targeted at our Coding & Marking customers in particular but also offers a good solution for printing direct to products, printing functional fluids and for 3D printing applications where a highly accurate delivery of ink drops and/or longer throw distances are important. Interest from our Coding & Marking customers has been positive with six customers already evaluating the printhead.

### New opportunities

The number of customers launching new machines has increased year on year, with ten customers launching with Xaar technology during 2021. The sectors into which the machines have been launched are varied and cover labels, ceramics, direct-to-shape, 3D printing and PCB printing. Four other planned launches have been pushed to 2022 due to delays caused by COVID-19.

In June we signed a co-operation agreement to establish a 'Joint Digital Printing Laboratory' with the Beijing National Innovation Institute of Lightweight Ltd. (BNI) in China. We are now collaborating on R&D projects built on the innovative technologies from both parties as well as their expertise in inkjet printing. The Joint Laboratory will develop new applications in digital inkjet such as printing glass, electronics, 3D and automotive spray painting.

### Operational efficiencies

Scalability of the Huntingdon factory has been a focus in 2021. We introduced some standard efficiency initiatives within the production area, restructuring the team into smaller work units. This makes it easier to train operators, easier to manage the teams on a day to day basis and easier to react to changing market demands through scaling up production quickly when necessary. In addition, a second initiative, the Xaar Excellence System, is now underway and covers Company-wide standards and processes.

Our IT Transformation Programme to establish a modern, secure and supportable IT infrastructure is also underway. This will enable us to deliver an optimised and consistent set of end-to-end operational processes.

The relocation of our corporate HQ from the Cambridge Science Park to the nearby Cambridge Research Park took place in July and will generate savings of £0.7 million per annum from the start of the second half of 2021. The new global headquarters houses Xaar's finance, HR, legal and marketing functions, as well as a new purpose-built R&D laboratory. Specifically configured to enhance the working environment for the team, the new offices embrace Xaar's commitment to flexible working for employees. Also, importantly the offices provide a significantly reduced carbon footprint for Xaar.

### A move towards an integrated service

We appointed an Ink Business Director in March 2021 to develop and roll out a new ink strategy aimed at building collaborative partnerships with leading fluid manufacturers. We are working with these companies to fully optimise the fluid, not just in the printhead in a lab setting, but also throughout the machine development programme, end user integration and beyond. This ensures optimum print performance in the actual application environment, and ultimately delivers a better end result for our customers and their customers, as well as shortening time to market for all parties. For our UDI customers we are selling fluids, manufactured by our fluid partners under the Xaar brand. This helps to tie us into a long-term relationship with these customers and will provide an ongoing revenue stream.

We made significant progress this year towards our goal of providing an integrated inkjet solution whereby our customers can access the printing ecosystem as well as the print technology from Xaar. In July we acquired FFEI, which is enabling us to widen our product offering (of print engines using Xaar technology) to our UDI customers.

The roadmap for our Ink Supply Systems, developed this year, will ensure that we can help customers evaluate and adopt our technology – and ultimately reduce their time-to-market. One focus in 2021 has been to upgrade the Hydra Ink Supply System for use with aqueous inks.

In March 2022 we acquired Megnajet, market leader in the design and manufacture of industrial ink management and supply systems for digital inkjet.

The acquisition is part of our strategy to offer our Printhead business unit customers a more integrated inkjet solution.

We have also developed our datapath roadmap, and are now working on delivering a rich portfolio of datapath products to help our customers develop their systems and solutions and also to ensure they can take advantage of the technology advantages available from our ImagineX platform.

### Building stakeholder engagement

We are now building momentum with our customer-centric business model, re-engaging with past customers and attracting new ones. Products launched this year are gaining good traction (23 projects with the Xaar Nitrox and six customers already evaluating the Xaar Irix), and we already have ten new customer launches with Xaar printheads during 2021.

Our 720 dpi print resolution is also attracting interest in our ceramics market. Xaar has the unique ability to print at this high resolution. This capability, which we showcased at Uniceramics, China, in June, has proven to be of interest to tile manufacturers looking to print exceptionally large tiles which are used for homeware products (for example, table tops).

In August we announced the opening of a new Customer Service Centre to better support our Chinese customers, delivering technical support and training and providing a fast response to customer needs.

The new marketing platform that we implemented at the end of 2020 is also driving audience engagement. Our campaigns in 2021 generated a unique reach of over 678,000 people, over 350,000 video views, over 15,000 meaningful engagements (likes, shares, comments) and gained us over 1,000 new followers on LinkedIn.

### Building a viable printhead business with a stable future

We are making good progress with delivering our product roadmap. The launch of the Xaar Nitrox in April delivered our first high frequency printhead which can reach speeds of 100 metres per minute. We delivered increased throw distance via the Xaar Irix in September, and the aqueous programme is on track with the printhead now in its beta testing phase. A significant focus for our marketing campaigns in H2 has been to promote the advantages of our Ultra High Viscosity capability, with the goal of opening up new applications which involve printing highly viscous fluids to achieve new functionality, such as increased product toughness or material flexibility.

**Our business units** continued  
 Printhead continued

**Our inkjet printhead range**



**Xaar Nitrox**

With unparalleled productivity and performance, the Xaar Nitrox lets you create without limits

**Xaar Irix**

Exceptional print quality, simple to use, robust, and highly reliable

**Xaar 2002**

High productivity and out-of-the-box exceptional print quality

**Xaar 1003 C**

Ultimate versatility in ceramic tile decoration

**Xaar 1003 U**

All round reliable high quality printing for industrial applications

**Xaar 1003 AMP**

Small drop deposition on an industrial scale

**Xaar 501**

High production up-time and industrial reliability

**Xaar 502 O**

Industrial reliability and mineral-oil free inks

**Xaar 502 S**

Exceptional print quality for Wide-Format Graphics

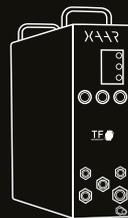
**Xaar 128**

Adaptable printhead with trouble-free integration

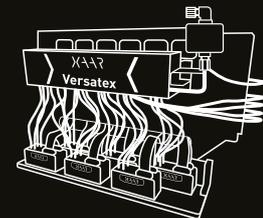
**Our integrated solutions**



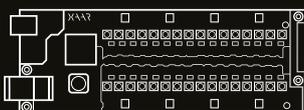
**Fluids**



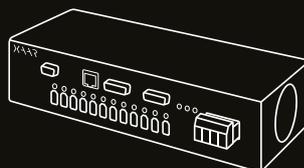
**Ink supply systems**



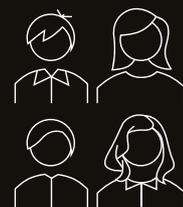
**Print engines**



**Drive electronics and datapath solutions**



**Support**



# Printhead – technologies

## Xaar's core inkjet technologies

We have a number of unique technologies which are incorporated into our printheads, and which provide distinct advantages to our customers.



### TF Technology

Xaar's TF Technology is the original and still the best ink recirculation technology available. A printhead's architecture determines how well ink recirculation is implemented and therefore influences the degree to which the method delivers benefits across today's wide range of printing and jetting applications. Xaar's TF Technology, together with the unique Hybrid Side Shooter printhead architecture, enables ink or other fluids to flow directly past the back of the nozzle during drop ejection at very high flow rates.

This ensures the nozzles are continuously primed, keeping the printhead operational and the nozzles firing and – with the ink in constant motion – prevents sedimentation and nozzle blocking, particularly in heavily pigmented inks. Any air bubbles and unwanted particles in the ink are also carried away, improving reliability, even in the harshest industrial environment.

This makes jetting significantly more reliable compared to alternative printhead designs where convoluted ink flow paths means that recirculation is close to but not at the back of the nozzle.

The main benefits of TF Technology are unrivalled jetting reliability, outstanding print quality and an increased production uptime.



### High Laydown Technology

Xaar's High Laydown Technology enables a range of new applications, thanks to its ability to deposit large quantities of fluid in each pass. It makes possible printing very high levels of UV inks or high build varnish in a single pass for tactile embellishments on labels, packaging and commercial print. Braille and label warning triangles are also possible. High Laydown Technology delivers unprecedented ink discharge rates for gloss and adhesive effects on ceramic tiles, so that effects can be printed at high line speeds.

For additive manufacturing applications, High Laydown Technology offers increased printing productivity which significantly accelerates build rate for parts and the ability to print a broader range of fluids including higher viscosity materials; this ultimately results in tougher 3D printed parts than those printed with standard inkjet technology.



### Ultra High Viscosity technology

Xaar's Ultra High Viscosity technology opens up a wide range of new inkjet capabilities and applications for OEMs and manufacturers using Xaar technology. Most printheads can only jet materials with viscosities of up to 10-25 centipoise ('cP'). Thanks to Xaar's unique TF Technology and innovative High Laydown Technology, fluids with significantly higher viscosities – up to 100 cP – can now be jetted.

The ability to lay down fluids with higher particle loading and particle sizes offers advantages such as an increased colour gamut, opacity and special effects. In addition, jetting higher molecular weight photopolymers for Advanced Manufacturing and 3D printing applications is made possible.

## Where we excel

- + **We are the only truly independent inkjet technology company with over 30 years of experience.** Our independence enables a flexible, collaborative approach to ensure we remain customer-centric and focus on their goals
- + **State-of-the-art UK manufacturing facilities and an enviable R&D department** staffed by scientists and engineers with a wealth of inkjet industry knowledge and expertise
- + **A comprehensive portfolio of products to cover a wide range of applications**
- + **Engineers with extensive knowledge of inkjet and its application across many sectors as well as considerable field experience.** This means they are able to assist our OEMs and UDIs in the successful design, build, commissioning and post-installation support of all Xaar-based inkjet systems
- + **Ready-to-use development kits and an extensive portfolio of systems components** ensures that OEMs and UDIs can get up and running quickly

## Priorities for 2022

- Continuing to deliver on the vertical integration strategy to support our goal of driving printhead sales
- Launch Versatex for our UDI customers
- Launch of aqueous printhead and the ecosystem to support it (such as the datapath and ink delivery systems)
- Launch Sustainability Roadmap.

# Our business units continued

## Product Print Systems

### Introduction to the Product Print Systems business unit

**Engineered Printing Solutions ('EPS') is a recognised leader in the industrial product marking machine industry, manufacturing highly automated machines and accessories. As well as providing an industry-leading service and support, EPS occupies a niche position as one of only a few bespoke product marking machine companies in North America.**

### What we achieved in 2021

2021 has been a rebuilding year within EPS.

In April, we changed the leadership of EPS. Additional changes were made in Finance, Human Resources, and EH&S Management. The sales group was re-organised into two distinct groups. One group focuses on selling pad print equipment and distributed inkjet printers and their related consumable items into the medical, industrial, promotional products, and other markets. A separate group focuses on selling the bespoke inkjet systems into industrial accounts.

We achieved +9% growth in sales in 2021 and ended the year with a strong order book for bespoke systems as well as a plan for continued strong growth for 2022.

At the very end of 2021 we took the largest single order in the Company's history (for multiple units) which will be realised during 2022, and the first half of 2023. There were continued challenges related to COVID-19 including no tradeshow presence and difficulty with travel, as well as regular interruptions of work schedules and supply issues.

We also made many changes in our internal procedures and business systems to allow a more focused approach to the business and better use of our resources to achieve results.

### Project focus

In 2021, EPS designed, built, and delivered a bespoke single pass machine for a leading player in the promotional products industry. Based on the XD-70 platform, this machine featured a six-axis robotic arm controlled by a vision system to load parts, inline flame pre-treatment, a five-colour, six-head print engine, and servo-controlled offload accumulators for sorting of different SKUs.

Stored recipes enable the robotic arm to locate the part from the load cell, spot check the part for correct orientation and place it on a conveyor for pre-treatment. The part then continues under the printheads for decoration. Following inline UV curing, the part is conveyed to a series of "gates" that open and close according to the recipe. In this manner, parts are sorted automatically. On average, this machine can mark 1,000 parts per hour, including changeovers.

This successful implementation of single pass printing technology to the promotional products industry is an important step forward for EPS. The COVID-19 pandemic affected this market segment greatly, as the cancellation of sporting events, weddings and closure of restaurants negatively impacted sales for promotional products. As these events start to come back online, EPS is poised to bring this disruptive technology to an established industry that is seeking new efficiencies for their product decoration services.

### Where we excel



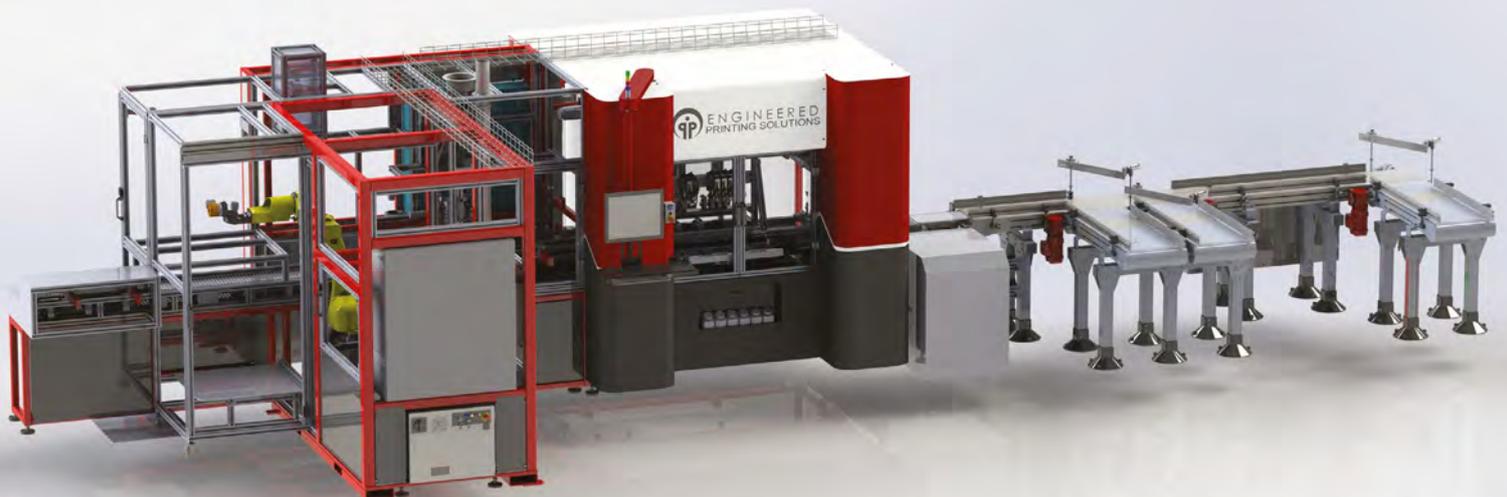
**Our core strengths are designing, building and integrating machines which allow our customers to product mark their parts in a highly automated manner, enabling significant cost savings and virtually unlimited print flexibility and personalisation.**

We offer unparalleled service and support which in turn ensures we build long-term relationships with our customers

### Priorities for 2022

In 2022, we will continue our efforts to standardise the base print engine platforms which become part of our customised inkjet solutions. The benefits of more standardisation will be lower costs and improved lead times.

At our core, EPS is an innovative group of very talented inkjet and automation experts who utilise their creativity and experience to design, build, and deliver specialised printing systems for our customers.



## Introduction to FFEI

Established in 1947, FFEI has an impressive reputation for developing innovative and award winning digital inkjet and life science solutions – from concept to delivery. Most importantly, FFEI works closely with customers to ensure their market knowledge is transformed into the digital imaging system they need to meet their bespoke requirements. The two core FFEI application areas are digital imaging solutions for label presses and digital pathology scanners.



## Where we excel

- + Over 65 years of know-how in industrial digital imaging technology
- + An extensive core technology patent portfolio
- + A reputation for developing sophisticated solutions from concept to delivery
- + A culture of innovation and a keen focus on customer needs, underpinned with highly capable and committed employees

## FFEI Inkjet

The inkjet side of FFEI focuses on the design and manufacture of inkjet print engines which it sells to OEMs to incorporate in their own systems and brand as their own.

The FFEI print engine includes an ink system, a control unit to run it and mounted Xaar printheads. The OEM will take these elements and mount them into their own press to add a new print feature.

To date, FFEI has focused on the labels and packaging market where the print engine provides an efficient way to add digital embellishments to analogue presses, for example, varnish embellishment, high laydown embellishment, high opacity white, variable data coding/marketing (which is very difficult without digital capability) and spot colours.

FFEI will continue to service its own customers as before but is developing a roadmap of products for Xaar's UDI customers which is launching in 2022 under the Xaar brand Versatex. This is a stripped back standard print engine which, because of the changes, is more versatile and open to a range of different applications. It offers a more complete solution for the UDIs who have less inkjet experience and who are looking for a standalone engine, helping them to keep development costs down and get to market more quickly.

## FFEI Life Sciences

### Digital pathology scanning technology

Over ten years ago FFEI applied its digital scanning expertise to the challenge of whole slide imaging (WSI) for pathology. Today its award-winning technology has been successfully taken to market by a number of blue chip clients. Central to the success of these scanners is FFEI's patented 'dynamic focus' technology, which delivers unparalleled scanning speed, z-stack functionality and high-resolution imaging.

Whether customers are seeking to add imaging capabilities to their existing core competencies, or are planning to extend their existing imaging portfolio, FFEI can help.

Optical imaging and detection technologies developed by FFEI have been successfully applied to a number of different laboratory formats and applications in partnership with a number of blue chip companies.

Product portfolio development is ongoing and there is now a pipeline of next generation scanning technologies; some are very close to market readiness, while others require further development. FFEI is now looking for new partners to reap the rewards of these next generation scanning systems.

### Sierra slide colour calibration technology

FFEI's solutions include its patented Sierra slide and the unique capability to integrate with cloud-based ICC colour management profile generators. The Sierra slide calibration technology universally standardises WSI image quality to the highest ground-truth fidelity across all digital pathology scanning systems. This ensures the true and normalised colour of stained tissue biopsies are presented to pathologists, researchers and AI alike.

# Business performance

## Continuing operations – revenue

**Revenue for the Group of £59.3 million is an excellent performance for the year, representing a year-on-year increase of £11.3 million (2020: £48.0 million) of which FFEI represents £5.3 million in the period since acquisition.**

It is a very pleasing result given the ongoing restrictions arising from COVID-19, with Printhead revenue increasing 14% and EPS 9%. Group revenues increased from £26.3 million in the first half of the year to £33.0 million in the second half driven principally by a £1.7 million increase in revenue from the EPS business. This is a strong recovery across the business demonstrating the positive customer engagement and trust that is being regained across our customer base and the continued momentum we have in the business.

Revenue from the Americas grew year-on-year across the Group, rising £3.3 million (2021: £23.6 million, 2020: £20.3 million), including £2.4 million from FFEI and despite a small drop in Printhead revenue of £0.3 million. The rise, driven by the recovery in EPS revenue, stems from increases in sales of digital machines and peripherals demonstrating the new commercial approach is being well received with customers.

Performance in Asia, and China in particular, has been very successful in 2021. This has been the key driver for the continued overall revenue growth in Printhead. Group revenue grew £1.3 million in the first half of the year to £5.8 million (H1 2020: £4.5 million) and continued to grow in the second half to £6.2 million (H2 2020: £5.1 million). This growth has largely been driven by the re-engagement of Chinese Ceramic OEM customers where our new product range is proving successful. Revenues in Printhead have increased year-on-year from £9.6 million to £11.9 million, a 24% increase.

This is a real proof point for the change in strategy; the removal of distribution channels, the implementation of a clear pricing strategy, and more significantly a change in how we interact and support our customers have all helped with the speed of adoption of the Xaar 2002 together with Xaar Nitrox and Irix in China.

Revenue in EMEA has continued to rise year-on-year. Excluding FFEI, revenue was £20.9 million compared to £18.1 million, and we have seen a promising continued upward trend in revenue since H2 2019. Revenue in the first half of the year increased £2.1 million compared to H1 2020 of £8.4 million and by £0.7 million in the second half compared to £9.7 million in H2 2020.

Printhead revenue for the year increased £4.8 million to £40.1 million (2020: £35.3 million). Growth in the first half was 20% and in the second half was 8% as we saw continued momentum in revenue throughout the year.

Printhead revenue growth stems from the continued recovery in the key sectors of Ceramics & Glass (C&G) with growth of £5.2 million (38%). Increasing market share with our extended product portfolio and being able to demonstrate our clear technology advantages has proven successful in the Chinese Ceramics market, where we have regained trust with our customers. We have also established a market leading position in Glass with the Xaar 2002 and won several accounts in the Glass sector in 2021, with revenue in 2021 increasing 38% compared to 2020.

Coding & Marking (C&M) revenue has remained largely flat year-on-year, while Direct-to-Shape (DTS) revenue has declined with the majority of the decline taking place in the Americas which we believe will be a short-term flattening of demand.

Whilst still a relatively small part of our business, DTS will prove to be an increasingly important sector for the business and an area for potential growth in the long term and it is encouraging that we are showing how our unique technology advantages can prove successful in this area by winning new accounts and commissioning new machines by switching their production lines over to a digital solution.

Wide Format Graphics (WFG) and Labels revenue fell slightly in the year from £6.3 million to £6.2 million. This is an area where we have seen some delays in orders, mainly COVID-19 related. As our customers are more able to access their own customer bases with a relaxation of travel restrictions, we expect this reduction to be one of timing only and to recover in 2022.

3D Printing and Advanced Manufacturing (AVM) have stayed relatively flat year-on-year (2021: £2.4 million, 2020: £2.5 million) with gains in 3D Printing offset by a reduction in revenues from AVM. As with the DTS market, the AVM market for printheads is still relatively small but growing, and we are very excited about our prospects in this area and expecting to see significant growth in the coming years. Both 3D Printing and AVM are markets where we are well positioned to take advantage of growth opportunities, but development cycles can be long, therefore, it can take several years for a customer to reach full production and ultimately significant demand for printheads.

Revenues from Packing & Textiles remain modest. Our ability to target this sector effectively is somewhat limited by our current product range. However, advancements in the product portfolio driven by the ImagineX platform should make this large sector more accessible in the future. Full year revenue of £0.8 million was down year-on-year (2020: £0.9 million).

Our royalty revenue stream was sold during 2019 and so we have a declining legacy royalty rate which will continue to decline in 2021 and 2022 before ceasing altogether shortly thereafter.

Revenue from the EPS business increased by £1.2 million to £13.9 million (2020: £12.7 million) as the new commercial approach has seen some significant customer order wins.

**Table A – Revenue by region – Continuing operations**

£m	2021 H1			2021 H2				FY 2021				FY 2020		
	PH	EPS	Total	PH	EPS	FFEI	Total	PH	EPS	FFEI	Total	PH	EPS	Total
<b>Americas</b>	3.9	6.1	10.0	3.4	7.8	2.4	13.6	<b>7.3</b>	<b>13.9</b>	<b>2.4</b>	<b>23.6</b>	7.6	12.7	20.3
<b>Asia</b>	5.8	-	5.8	6.1	-	0.1	6.2	<b>11.9</b>	-	<b>0.1</b>	<b>12.0</b>	9.6	-	9.6
<b>EMEA*</b>	10.5	-	10.5	10.4	-	2.8	13.2	<b>20.9</b>	-	<b>2.8</b>	<b>23.7</b>	18.1	-	18.1
<b>Total</b>	20.2	6.1	26.3	19.9	7.8	5.3	33.0	<b>40.1</b>	<b>13.9</b>	<b>5.3</b>	<b>59.3</b>	35.3	12.7	48.0

\* Includes plc £0.2 million 3D service fee allocated to PH and EMEA. Figures subject to rounding.

This has been driven particularly by digital inkjet machine sales with growth of 11%, which is particularly pleasing as this will be the core focus for the business in the future. Pad print machine revenue has also increased (8%) albeit with a decline year-on-year in the second half. The focus on consumables and accessory sales has contributed to the growth as a result of the change in commercial approach, with increased revenue from ink, plates and parts. We see a strengthening pipeline and order book and we are well placed to deliver further growth in 2022 as companies start to invest in capital equipment again and those markets affected by the pandemic, such as Ad Speciality and Promotional Products, start to recover.

## Continuing operations – gross profit

Gross profit for the year increased by £7.2 million to £20.2 million (2020: £13.0 million) with an increase in the gross margin to 34% (2020: 27%). This was primarily the result of an improvement in the Printhead business unit's gross profit which grew from 27%. We increased utilisation of the factory as throughput was increased during the year resulting in better overhead cost recovery, supporting margin gains. We have worked hard on cost saving initiatives during the year and as we increase volumes there should be further scope for improved overhead recoveries and accordingly margin gains. During 2021 we proactively worked to secure raw materials which should reduce further supply chain risks. Issues in supply chains globally are well known and documented, particularly so for semi-conductors and other technology materials, with increasing cost pressures. Our actions in Q4 should insulate us from further costs and mean we are able to meet customer demand throughout 2022. We have increased our working capital with inventory rising £9.1 million (2020: £4.8 million reduction in inventory). This higher level of both raw materials and finished goods is a deliberate, prudent approach which we believe will see us well placed to both manage customer requirements and further insulate the business from external supply chain risks whilst utilising the high level of operational gearing to deliver further improvements in the gross margin.

Gross profit for the EPS business declined £0.2 million in the year to £3.2 million (2020: £3.4 million) with gross margin down year-on-year (2021: 23%, 2020: 27%). Actions taken to refocus the business on future growth opportunities mean 2021 results have been impacted by non-cash write down adjustments totalling £0.7 million. These are largely related to inventory we now consider to be slow moving or obsolete.

**Table B – printhead revenue**

£m	2021 H1	2021 H2	FY 2021	FY 2020	Var	Var %
Ceramics & Glass	9.5	9.5	19.0	13.8	5.2	+38%
C&M and DTS	5.9	5.2	11.1	11.5	-0.4	-3%
WFG & Labels	3.4	2.8	6.2	6.3	-0.1	-2%
3D Printing & AVM	1.0	1.4	2.4	2.5	-0.1	-4%
Packaging & Textiles	0.2	0.6	0.8	0.9	-0.1	-11%
Royalties, Commissions & Fees <sup>1</sup>	0.2	0.4	0.6	0.4	0.2	+50%
<b>Total</b>	<b>20.2</b>	<b>19.9</b>	<b>40.1</b>	35.3	4.8	14%

<sup>1</sup> Royalties in H2 includes £0.2 million relating to Xaar / Stratasys service fee administered by Group.

Figures (£m) and percentages (%) are subject to rounding.

**Table C – EPS revenue**

£m	2021 H1	2021 H2	FY 2021	FY 2020	Var	Var %
Digital inkjet	3.6	4.4	8.0	7.2	0.8	+11%
Pad printing	2.4	3.1	5.5	5.1	0.4	+8%
Other	0.1	0.3	0.4	0.4	-	-
<b>Total</b>	<b>6.1</b>	<b>7.8</b>	<b>13.9</b>	12.7	1.2	+9%

\* Figures (£m) and percentages (%) are subject to rounding.

Excluding the non-cash adjustments mainly relating to slow moving and obsolete inventory, the underlying gross margin was 28%, largely due to the resetting of the modular strategy by new management. Excluding the £0.7 million of adjustments recorded by EPS in 2021, the gross profit for the Group would have improved to £20.9 million, with a gross margin of 35%.

## Continuing operations – R&D

R&D spend of £5.7 million was up £1.2 million on 2020 (2020: £4.5 million). This reflects the investment in the ImagineX platform which will be central to our long-term growth, with the added investment in FFEI of £0.4 million. The total increase is in proportion to our revenue growth and maintains a spend/revenue ratio of approximately 10%. Sales and marketing spend for the year was £6.3 million (2020: £6.0 million). The increase in spend of £0.3 million year-on-year reflects the focus on sales and business development in the Printhead business unit following the restructuring of the business in the second half of 2020. Savings were seen in both the Printhead and EPS businesses due to COVID-19 which limited our ability to visit customers and led to the cancellation of the majority of tradeshow which one, or both, businesses would have attended.

## Continuing operations – expenses

General and administrative expenses increased £2.1 million from £8.0 million in 2020 to £10.1 million in 2021. This increase largely relates to planned investment in key areas of the business and infrastructure, including operations, IT and finance, offset by £0.3 million related to trading foreign exchange gains in 2021, as a result of the exchange rate volatility response to COVID-19.

Impairment reversals on financial assets were £0.4 million (2020: £0.9 million). This reversal predominantly relates to a distribution channel used by the Printhead business and the collection of a customer debt previously provided for.

Other operating income in 2020 of £0.8 million related to the PPP loan taken out by the EPS business in the US which met all qualifying criteria to be forgiven.

Restructuring and transaction costs of £1.4 million (2020: £0.8 million) predominantly relate to re-organisation costs, acquisition related professional fees and additional costs relating to the dilapidation and exit of the office on the Cambridge Science Park.

# Business performance continued

**Table D – Movement in net cash\* (including 3D)**

£'000	2021	2020
Cash & treasury deposits – Continuing operations	25,051	18,117
Cash & treasury deposits – 3D operations	–	2,120
<b>Cash &amp; treasury deposits at the end of the year</b>	<b>25,051</b>	20,237
Cash & treasury deposits at the beginning of the year	20,237	25,322
<b>Total net cash inflow/(outflow)</b>	<b>4,814</b>	(5,085)
Effect of foreign exchange rate changes on cash balances	110	57
<b>Increase/(Decrease) in net cash for the Group</b>	<b>4,924</b>	(5,028)
<b>Consisting of:</b>		
<b>Total cash (outflow) / inflow from continuing operations</b>	<b>(2,342)</b>	7,073
<b>Cash outflow from Xaar 3D business</b>	<b>(2,109)</b>	(7,018)
<b>Xaar 3D – Proceeds from share capital and share sale</b>	<b>9,272</b>	–
<b>Net cash inflow (outflow) from Thin Film operation</b>	<b>103</b>	(5,083)
<b>Increase/(Decrease) in net cash for the Group</b>	<b>4,924</b>	(5,028)

\* Net cash is defined as cash and cash equivalents, plus treasury deposits.

## Continuing operations – profit

The profit before tax from continuing operations under IFRS was £1.0 million in 2021 (2020: £4.3 million loss). Basic earnings per share from continuing operations was 0.9p (2020: loss 5.7p).

The performance of the Printhead business improved £6.5 million from a £4.3 million loss in 2020 to a £2.2 million profit before tax in 2021, driven by increased sales, a much improved gross margin, and a reduction in operating expenditure. The EPS business went from a £0.3 million profit in 2020 to a £0.9 million loss in 2021 due to the impact arising from the write off and provisioning of legacy inventory. Excluding this one-off impact, the EPS business made a small loss which given the underlying performance of the business should see turn this into profit during 2022.

FFEI contributed a profit before tax of £0.4 million since acquisition on 11 July 2021.

In calculating the adjusted loss before tax we have adjusted for gains on derivative financial liabilities of £2.9 million (2020: £0.1 million) and fair value gains on financial assets of £1.0 million (2020: nil) alongside restructuring costs of £1.4 million, foreign exchange losses on intra-group loans of £0.1 million, and share-based payments of £0.7 million with an R&D expenditure credit of £0.3 million and amortisation of acquired intangible assets of £0.4 million (see Financial Statements – note 4 on page 130).

The adjusted loss before tax from continuing operations was £0.6 million, compared to £3.9 million loss in 2020. This is a significant step forward for the business, emphasised by the delivery of adjusted profit in the second half of 2021. The adjusted EBITDA for continuing operations in the year was £3.2 million (2020: £0.1 million).

## Discontinued operations

Due to the divestment of the remaining investment in Xaar 3D, completed on 1 November 2021, the results are classified as discontinued operation. The business was classified as an asset held for sale as at 31 December 2020.

A £13.5 million profit was recorded in relation to discontinued operations (2020: £10.3 million loss) with cash outflows for the period of £1.9 million (2020: £12.1 million). The Thin Film business, which was classified as discontinued in 2019, recorded a loss of £0.2 million (2020: £3.7 million) which related to inventory commitments and supplier liabilities. All liabilities regarding the Thin Film business have now been settled. The 3D business recorded an operating loss of £4.2 million in 2021 (2020: £6.4 million loss).

The Group has recognised a gain on the sale of the investment in subsidiary of £17.9 million, comprising net cash received of £9.3 million, with contingent consideration at the transaction date of £10.9 million, less transaction costs of £0.2 million.

Basic earnings per share from discontinued operations was 20.0p (2020: loss 9.5p).

## Profit for the year

The Group profit for the year was £14.2 million (2020: £14.7 million loss) of which £16.2 million is attributable to the owners of the Company (2020: £11.7 million loss), with a £2.0 million loss to non-controlling interests (2020: £3.0 million loss). The total basic earnings per share attributable to shareholders is 20.9p (2020: loss 15.2p).

## Cash generation

The Group retained a healthy cash balance of £25.1 million at the year end, representing an increase of £4.9 million during the year, comprising a cash outflow from continuing operations of £2.3 million, with discontinued Xaar 3D operations utilising £2.1 million, being offset against cash proceeds received for the sale of Xaar 3D of £9.3 million.

Operating cash inflow for continuing operations before working capital was £2.7 million due to improved aEBITDA of £3.2 million delivered principally in our Printhead division.

As a result of the managed investment in inventory, working capital saw an outflow of £3.4 million, with improvements in receivables and payables helping to offset some of the £9.1 million increase in inventory.

The Group maintains a strong disciplined focus on cash, and this will continue throughout 2022. During 2021, investing activities saw a cash spend of £2.3 million, mainly on infrastructure and IT projects.

The business has a clear plan and strategy which the strong balance sheet and cash position will support. There remain external development opportunities which, if they can expand our capabilities and expertise, we will look to potentially add to the Group. We will also continue to invest internally to ensure we have the operational capacity and efficiency to meet future demand, alongside investment in our product roadmap development.

## Strong balance sheet

Non-current assets increased £22.7 million in the year from £24.7 million to £47.4 million. This was driven by the increase in goodwill following the acquisition of FFEI Limited of £0.7 million, along with an increase in intangible assets of £3.8 million. The identification of financial assets at fair value arising from the sale of 3D assets was £10.9 million plus revaluation through profit and loss at year end of £1.0 million (2020: £nil). Additionally, there were increases in right-of-use assets of £7.3 million, and a £0.9 million reduction in property, plant and equipment as new purchases were controlled in line with the Group's cash focus.

Current assets, excluding the disposal group assets held for sale, increased £18.4 million from £38.1 million in 2020 to £56.5 million. A significant proportion of this increase is attributable to the increase in inventories of £9.1 million to £18.8 million (2020: £9.7 million), associated with the managed investment in our supply chain capability. Trade and other receivables increased by £2.5 million to £12.1 million (2020: £9.6 million) and cash and cash equivalents (including treasury deposits) increased by £7.0 million to £25.1 million (2020: £18.1 million), with current tax assets increasing by £0.1 million to £0.5 million (2020: £0.4 million). Each of these were primarily driven by the consolidation of FFEI.

The 3D business was classified as held for sale with £10.0 million of assets in 2020 and disposed of in 2021.

Current liabilities, excluding liabilities associated with Xaar 3D (held for sale) in 2020 of £1.6 million, increased by £8.7 million to £23.0 million (2020: £14.3 million) primarily due to the increase in trade and other payables of £11.6 million to £21.5 million (2020: £9.9 million), as a result of the consolidation of FFEI. A reduction in the provision balance of £0.2 million arose from the utilisation of the £0.3 million restructuring provision in the year, offset by an increase in warranty provision of £0.1 million. Current lease liabilities increased by £0.1 million to £1.2 million (2020: £1.1 million), with the disposal of Xaar 3D also removing the liability arising from derivative financial instrument, of £2.9 million.

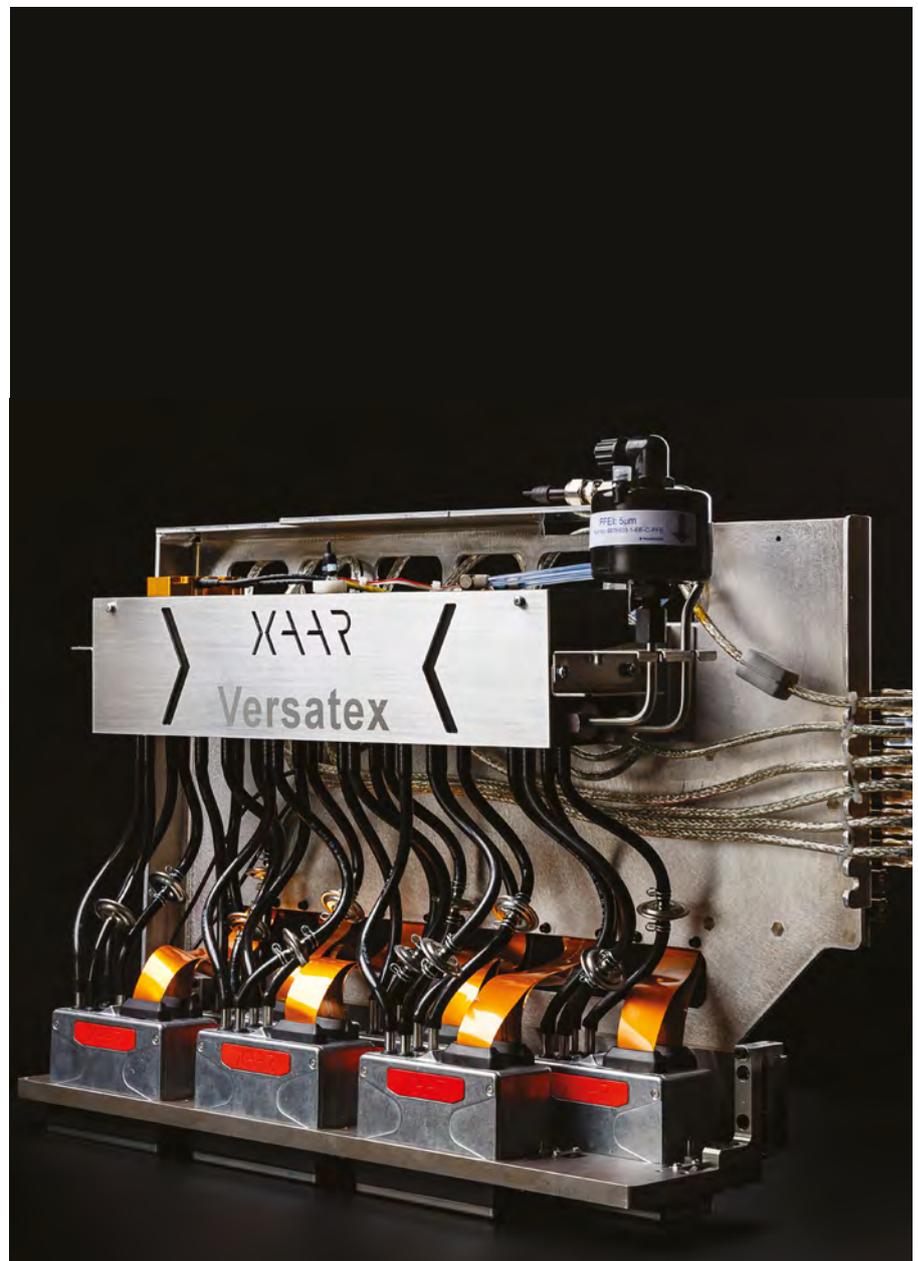
Non-current liabilities increased by £10.7 million to £12.2 million (2020: £1.5 million), which mainly relate to lease liabilities recorded under IFRS 16 for property, which increased by £7.0 million to £8.5 million (2020: £1.5 million) in the year, alongside recognising a dilapidation provision on leases of £0.3 million (2020: £nil) and long-term liability of £3.4 million for the deferred consideration on the acquisition of FFEI Limited.

## Dividend

No dividend has been declared for 2021, as the Board believes that prioritising cash for continued investment in the business at this stage of our rebuilding programme will deliver more compelling returns for shareholders in the medium term.

**Table E – Cash flow table – Continuing operations (excluding 3D)**

	2021	2020
<b>aEBITDA</b>	<b>3,183</b>	62
Restructuring and transaction expenses	(1,404)	(754)
Depreciation of right-of-use assets	871	1,107
Government grant (PPP loan)	–	819
Other	90	144
<b>Operating cash flows before movement in working capital</b>	<b>2,740</b>	1,378
<b>Movement in working capital</b>	<b>(3,383)</b>	6,735
<b>Cash (utilised) / generated by operations</b>	<b>(643)</b>	8,113
Income taxes received	288	351
Net cash used in investing and other financing activities	(1,987)	(1,391)
<b>Net (decrease) / increase in cash and cash equivalents from continuing operations</b>	<b>(2,342)</b>	7,073





# A strong belief in responsibility

**The Group strongly believes that effective management of the ESG agenda is integral to business success. The Group is not only compliant with all relevant regulation and legislation but has increasingly focused on enhancing the working environment for our employees and minimising the environmental impact of our manufacturing processes. There is internal reporting of key metrics to ensure continuous improvement throughout the business, and each member of staff is expected to take individual responsibility for their contribution and to work together to achieve shared goals.**

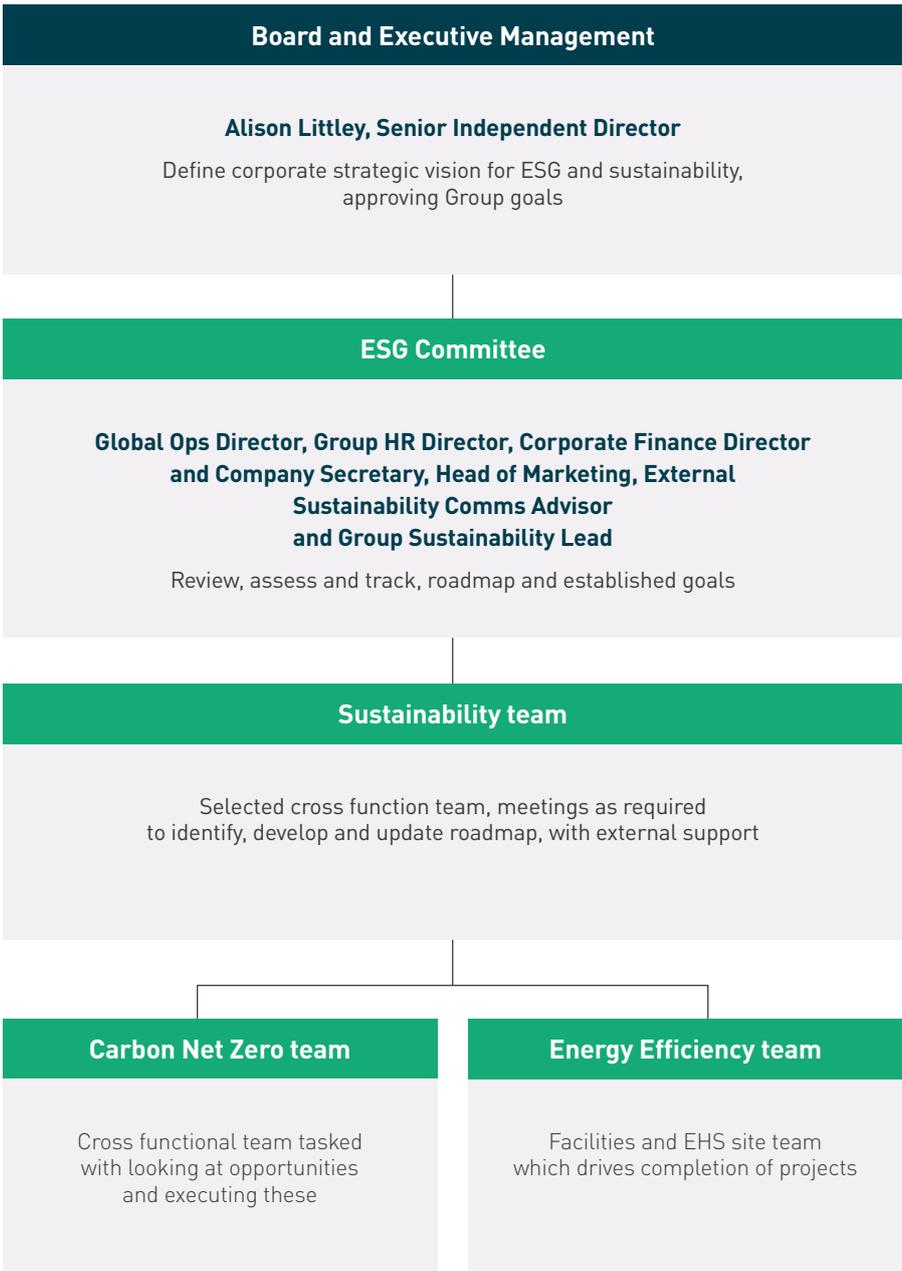
Digital print methods are inherently more environmentally friendly than the analogue techniques we seek to replace.

Our research shows that, compared to analogue alternatives, digital has a significant impact in reducing energy consumption (by as much as 55%), water consumption (by up to 60%) and CO<sub>2</sub> emissions (by up to 95%), in addition to reducing pollution and waste materials.

## **Sustainability governance structure**

In the second half of 2021 we established a more formal ESG governance structure and formed a Sustainability team with accountability to the Board. The team, formed from representatives across the business, has developed a co-ordinated ESG Roadmap that will push Xaar towards its "Net Zero by 2030" goal. The Roadmap has four key pillars – Environment, People, Innovation and Community; its purpose is to drive our ESG goals beyond the Energy Reduction scope to a broader Group wide activity. The Roadmap will provide an essential backbone for much of Xaar's future investment and activity.

Xaar is committed to reducing its impact on the environment wherever possible, with Senior Independent Director Alison Littlely having specific responsibility for ESG matters.



### Environment

Environmental best practice, our investment in sustainable manufacturing and improving operational efficiencies remain key areas of business focus. The Group fully complies with local and national regulatory requirements in respect of the environment relating to its use, storage, handling and disposal of materials, chemicals, and waste products.

Xaar maintains a Certified Environmental Management System that meets the requirements of ISO 14001:2015, helping us to manage our environmental aspects and impacts, which complements our commitment to continual improvement. It is readily available to view for interested parties. We carry out environment management reviews and audit programmes designed to measure our progress in relation to our policy statement and objectives.

### Climate change

We have escalated climate change from an emerging risk to a principal risk as part of our risk management process.

See Risk management on page 44

Our aspiration is to lead our industry in environment and sustainability, in order to minimise the impact we and our products have on the world around us. We have set the aspiration to be 'Net Zero by 2030' and to drive sustainable growth and innovation for the zero carbon economy.

See Innovation on page 34

In 2022, we will assess the risks and opportunities of climate change to deliver activities that improve our resilience by either mitigating or adapting against physical and transitional risks. This will include a commitment to both setting Science Based Targets and evaluating the UN Sustainable Development Goals to determine those of primary importance to the Group.

## Our ESG Roadmap – founded on four pillars

**The ESG Roadmap aligns with the Xaar EPIICC values**  
 Read more about EPIICC on page 32

<p><b>+</b> <b>Environment</b></p> <p>Leading the way in environmental sustainability for the industrial inkjet technology sector.</p> <p> Read more on page 29</p>	<p><b>+</b> <b>People</b></p> <p>An employer of choice by putting our people, their potential and wellbeing at the heart of all we do.</p> <p> Read more on page 31</p>	<p><b>+</b> <b>Innovation</b></p> <p>Encouraging more sustainable approaches to design, manufacture, technology and collaboration across the whole product lifecycle.</p> <p> Read more on page 34</p>	<p><b>+</b> <b>Community</b></p> <p>Actively engaging with our communities to provide practical, effective, lasting support that benefits society.</p> <p> Read more on page 35</p>
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# Sustainable and responsible business continued

## Carbon / greenhouse gas emissions

A key Group activity at Xaar has been to identify opportunities, and drive continual improvement in energy efficiencies. We have seen reductions in energy usage and greenhouse gas emissions of the Company recorded in Scope 1 and 2 since 2015.

 **See Greenhouse gas emissions statement on page 41**

As part of the development to ensure affordable and clean energy, Xaar has entered into a supply contract during 2021 for the supply of green electricity from a renewable source in the UK. The target is to achieve 100% from renewable sources in the UK and to investigate methods to roll this out to other subsidiaries and locations throughout the Group.

All Group UK manufacturing locations are now supplied with certified carbon free electricity. Offices and laboratories will convert where green energy is available in 2022.

## Carbon offset

During 2021, Xaar offset all 2020 Scope 1 and 2 carbon emissions (1,815 tCO<sub>2</sub>e) for the Printhead business. We purchased trees to be planted in the UK, and Amazon tree protection (1,000 trees = 1,000 tonnes CO<sub>2</sub>e). In addition we offset 815 tCO<sub>2</sub>e purchasing solar cookers as part of the Heqing Solar Cooker Project for poor rural farmers in remote areas of China to replace coal for cooking and hot water needs.

In 2022 we will continue to offset our residual Scope 1 and Scope 2 carbon emissions, whilst we investigate and identify the full extent of the boundary in relation to our Scope 3 emissions which will be added to the offset in the future.

## Waste

Xaar strives to reduce the amount of waste we produce, ensuring that all waste is disposed of ethically and legally through responsible waste handlers.

In 2021, the Group set a recycling target of zero waste to landfill, with any waste not recycled being sent to a waste to energy recovery process.

- **Electronic waste:** The Group is compliant with WEEE (Waste Electrical and Electronic Equipment) directives as required under UK and EU legislation.

Our waste handler Veolia has provided confirmation that zero waste went to landfill in 2021.

# 0kg

Landfill

# 13.48Kkg

Waste diverted

# 9,692kg

Waste recycled

## Plastics and packaging

Xaar initiated a project to remove packaging complexity and improve sustainability, introducing new packaging for its printhead products in 2020. This project to remove plastic as a packaging material has reduced our plastic consumption by 1.2 tonnes per year.

Significant improvements in the use of fully recyclable and biodegradable cardboard packs during 2021 led to all printheads being shipped in boxes made from a mix of recycled and new material – whereby at least 70% of the printhead box and 85% of the cardboard inserts are from a recycled source.

In 2022 the Xaar Logistics team continues to focus on the remaining peripheral packaging boxes, with aspirations to convert all packing materials to be fully recyclable by mid-2022.

## Biodiversity

Biodiversity is the key to healthy ecosystems, to provide us with the soils, nutrients, pollinators (75% of the world's crops are pollinated by insects), food and water that we need to survive.

As outlined in Carbon offset, to achieve carbon neutrality we are supporting action to protect trees in the Amazon, and have planted 1,000 trees in the UK. In 2022, we are looking to support and promote local employee campaigns, starting with the introduction of a beehive on site in Huntingdon, UK, and the distribution of wild flower seeds to employees.

In the medium term we will link biodiversity improvements with the employee wellbeing programme in developing outside spaces and garden areas for employees to actively promote physical and mental health.

None of our sites are located in or adjacent to protected areas.

## Water

We have determined that our operations are considered as low water usage, and we do not have any operations in any regions with high water stress. However, within our Huntingdon factory location we need to be cognisant of the risk of flooding in the North of the Cambridgeshire region and the Fens, as well as the stress on the chalk streams and water aquifers in the South Cambridgeshire region. Xaar therefore considers water management throughout all activities of the Company and that water should be treated in a manner that will protect it for future generations.

- **Usage:** Water usage in Huntingdon operations is limited to domestic use. We regularly monitor and record water usage, and utilise water efficient taps and cisterns.
- **Emissions:** Xaar has a permit to discharge issued by Anglian Water; the effluent discharge is checked monthly by external consultants to ensure conformity to site discharge levels and content and reports show discharges are below permitted levels. There are no reported incidents in the last 12 months with regards to emissions to water.

## Air

- **Quality:** We regularly monitor the air quality, temperature and relative humidity levels within the Huntingdon cleanroom facility. All cleanroom air supplies are fitted with HVAC filters. Xaar also remains conscious of the need for good indoor air quality, working hard to ensure adequate air circulation and routine maintenance of the systems.

There are smoking areas located away from Huntingdon building entrances.

- **Emissions:** Xaar has a permit issued by Huntingdon District Council due to the business using more than 2 tonnes of solvent for surface clean down each year. To comply with the permit any waste gases must not exceed total VOCs per room of 75mg/Nm<sup>3</sup>. This has been audited and confirmed via an external UKAS accredited company. There are no reported incidents in the last 12 months with regards to emissions to air. There are no significant air emissions in relation to NO<sub>x</sub> / SO<sub>x</sub>.

Printhead water usage	2021	2020
Freshwater usage (m <sup>3</sup> )	5,000	5,087
Intensity ratio (m <sup>3</sup> /£m turnover – excl. royalties)	127	146
Effluent and waste water (m <sup>3</sup> )	4,542	4,984



### Hazardous materials

All substances handled and used by Xaar are in accordance to the CoSHH regulations and industry best practice, by risk assessment and evaluation in their usage, storage and disposal. Care is taken to look for any less harmful alternative substances where possible to minimise any potential impacts in their use beforehand.

## People

### Human rights

**The Group respects all human rights and regards those rights relating to non-discrimination, fair treatment and respect for privacy to be the most relevant and to have the greatest potential impact on its key stakeholder groups of customers, employees and suppliers.**

The Group undertakes extensive monitoring of the implementation of all of its policies and has not been made aware of any incident in which the organisation's activities have resulted in an abuse of human rights.

Xaar is committed to only supplying product that contains conflict free materials. Suppliers of parts containing tin, tantalum, tungsten or gold to Xaar are sent and required to complete an EICC- GeSI declaration providing evidence that parts supplied do not contain minerals sourced from areas of conflict – DRC or adjoining areas.

The Board has overall responsibility for ensuring that the Group upholds and promotes respect for human rights. The Group seeks to anticipate, prevent and mitigate any potential negative human rights impacts as well as enhance positive impacts through its policies and procedures, in particular, through its policies regarding employment, equality and diversity, treating customers fairly and information securely. Group policies seek both to ensure that employees comply with the relevant legislation and regulations in place in the UK and other operating locations and to promote good practice. The Group's policies are formulated and kept up to date by the relevant business area, authorised by the Board and communicated to all employees.

### Code of Conduct

All new employees complete an induction process that outlines the expectations of the Company, its employees, customers and suppliers for the way in which business is conducted and helps to avoid situations that might lead to adverse legal issues or damage to our reputation.

The Group's most important corporate policies are incorporated into the Xaar Code of Conduct, and should be complied with at all times:

- Anti-bribery and Corruption Policy
- Confidential Information Policy
- Corporate Criminal Offence Policy
- Data Protection Policy
- Employee Share Dealing Code
- Email and Internet Policy
- Gifts, Entertainment and Hospitality Policy
- HS&E Policy Statements
- Sanctions Policy
- Whistle blowing Policy.

Each year the Group requires all employees to read and confirm that they understand and comply with these policies.

 See Group policies outlined in the Non-financial information statement on page 56

### Whistleblowing

We have a Whistleblowing Policy that encourages open and honest communication where incidents of non-compliance are seen in our business. Whistleblowing issues are reported directly to management, and any significant issues, should they arise, are reported to the Audit Committee. In each instance, cases are investigated in detail and appropriate action taken.

There have been no whistleblowing incidents or reports by senior management to the Audit Committee.

# Sustainable and responsible business continued

## Modern slavery

The Group is committed to acting ethically and with integrity in all our business dealings and relationships, implementing and enforcing effective systems and controls to ensure modern slavery in all its forms (including human trafficking, forced labour and child labour) is not taking place anywhere in our Group businesses or in any of our supply chains. The Group has published a Group-wide Modern Slavery Policy and a statement on the steps taken to prevent slavery, which is available on the Group's website.

## Health & safety and environment

Xaar has manufacturing sites in Huntingdon, Hemel Hempstead, and the USA, supported by R&D laboratories in Cambridge and Sweden, alongside head office functions in Cambridge, plus sales offices worldwide.

It is always Xaar's intention to conduct business in a manner that protects the public, the environment, and employee safety. Xaar's Environmental and Health and Safety policies provide a framework for the setting and reviewing of Occupational Health, Safety and Environmental Objectives. This demonstrates Xaar's continued commitment to the prevention of injury and ill health and also the continual improvement in our Environmental and Occupational Health and Safety Performance. Xaar believes that the combination of a safe place of work and safe working practices, together with a productive and innovative environment, are critical to the continued success of the Company.

UK Health & Safety reports	2021	2020
RIDDORs*	0	0
Accidents	9	6
Incidents	11	9
Near misses	5	7

\* Reporting of Injuries, Diseases and Dangerous Occurrences Regulations.

The Group undertakes R&D activities and manufactures products in the UK and the USA. The Group complies with all local and European legislation. The Group's manufacturing facility in Huntingdon is both ISO 9001:2015 and ISO 14001:2015 certified and as a minimum complies to HSG65. It is the Group's policy to maintain this level of certification for its Huntingdon manufacturing facilities and to comply at all times with all relevant environmental and other legislation in the territories in which the Group operates. The Group is compliant with REACH ('Registration, Evaluation, Authorisation and restriction of Chemicals'), WEEE ('Waste Electrical

and Electronic Equipment') and RoHS ('Restriction of the Use of Certain Hazardous Substances') directives, as required under UK and European legislation. The Group has a proactive Health and Safety System modelled on OHSAS 18001/HSG65 in Cambridge, Huntingdon and Hemel Hempstead.

## Equality and diversity

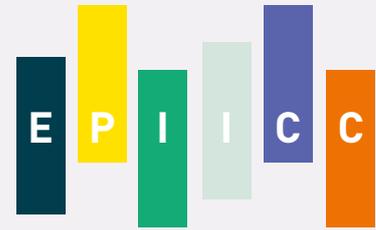
The Group is committed to providing a working environment in which employees feel valued and respected and are able to contribute to the success of the business. Employees are requested to co-operate with the Group's efforts to ensure that the policy is fully implemented.

The Group's aim is that its employees should be able to work in an environment free from discrimination, harassment and bullying, and that employees, job applicants, customers, retailers, business introducers and suppliers should be treated fairly regardless of:

- race, colour, nationality (including citizenship), ethnic or national origins;
- gender, gender reassignment, sexual orientation, marital or civil partnership status;
- religious or political beliefs or affiliations;
- disability, impairment or age;
- real or suspected infection with HIV/AIDS;
- membership of a trade union;
- pregnancy, maternity and paternity;

and that they should not be disadvantaged by unjust or unfair conditions or requirements.

## A value-led culture



## Everything with Passion

We care about our technology, our products, our partners and each other.

## Innovative

We always look for new, better solutions.

## Integrity

We deliver on our promises.

## Creative

We push the boundaries of what's possible.

## Collaborative

We work together as a team and with our clients.





The Group aims to ensure that applications for employment from people with disabilities, and other under-represented groups, are given full and fair consideration and that such people are given the same training, development and job opportunities as other employees. Every effort is also made to retrain and support employees who suffer from disabilities during their employment, including the provision of flexible working to assist their re-entry into the workplace.

The Group places considerable value on the involvement of its employees and has continued to keep them informed of the various factors affecting the performance of the Group. This is achieved through written communications shared through the Company intranet and email, and formal and informal meetings. All employees participate in a bonus scheme based on individual performance and Group business targets and, in the UK, have the opportunity to participate in an HMRC approved Share Save Scheme and Share Incentive Plan.

Based on the closing headcount at 31 December the split of staff by gender was as follows:

	2021 Male/ Female	2020 (restated) Male/ Female
<b>All employees</b>	<b>350/105</b>	311/77
<b>Directors</b>	<b>4/1</b>	4/1
<b>Senior managers</b>	<b>39/7</b>	27/5
<b>Employees</b>	<b>307/97</b>	280/71

The split between senior managers and employees (inc. agency staff) has been redefined and 2020 restated.

### CEO pay gap ratio

The following table sets out the ratio of the CEO's total remuneration in respect of FY21 (taken from the single figure table on page 92) to the 25<sup>th</sup> percentile, 50<sup>th</sup> percentile (i.e. the median) and the 75<sup>th</sup> percentile full-time equivalent (FTE) of the Group's UK employees. In line with the applicable regulations, the corresponding ratios for 2020 are also included.

	2021	2020
<b>Method</b>	<b>Option A</b>	Option A
<b>25<sup>th</sup> percentile</b>	<b>16:1</b>	15:1
<b>Median pay ratio</b>	<b>11:1</b>	11:1
<b>75<sup>th</sup> percentile</b>	<b>7:1</b>	8:1

 **Further information is provided in the Remuneration Committee report on page 98**

### Gender pay gap

Gender pay reporting is required for companies with over 250 employees. Xaar is reporting as Xaar Plc, including all UK subsidiaries. The snapshot date for Xaar's data is 5 April 2021. At that point Xaar had 265 relevant employees: 213 male and 52 female.

It is fundamentally important to understand that a gender pay gap does not necessarily mean men are paid more money for doing the same job. At Xaar we are committed to ensuring we pay based on merit not gender and we regularly monitor our pay awards to ensure that we pay the same rate for similar roles.

Xaar's mean gender pay gap stands at 14.38% (2020: 22.96%). As with many companies we do have a gender pay gap, though our results are consistent with other companies who operate within the technical, manufacturing or engineering sector.

There has been a shift across the quartiles with more movement for female employees from lower middle quartile to higher middle. This is a reflection of more female employees being promoted and appointed to senior roles.

We appreciate that improving our diversity will improve our results, and we continue to work on improvements over the longer term. A large part of Xaar's gender balance gap is due to the challenges of recruiting women into science and technology roles. Nevertheless we are continuing to work on increasing our gender balance in the following ways:

- Xaar operates in a male dominated industry and we are working to ensure that our hiring managers are trained to understand and recognise gender bias. We do, however, receive significantly fewer applications from females for technical roles.
- Our Talent Acquisition team assists hiring managers by giving practical advice, support and monitoring for gender bias. We seek to have both female and male candidates as part of the hiring pool whenever possible and we constantly review our processes to ensure we are encouraging more female applicants.

# Sustainable and responsible business continued

- Xaar is supporting Cambridgeshire *Engineers of the Future* by sponsoring local schools' Imagineering Clubs, which is designed to introduce children to engineering and hopes to inspire young people and especially girls to take up STEM subjects. A number of our women from Engineering participate in these endeavours.
- We support all employees to achieve their potential with a talent management programme and we offer flexible working arrangements to support working parents.

## Pension

The Group Personal Pension scheme is administered by Scottish Widows.

The Company pension contribution for Directors' (or cash allowance equivalent) does not exceed the contribution available to the majority of the workforce, currently 6% of base salary.

All the equity assets in the Pension Portfolio Funds now track indices, which exclude certain stocks on environmental, social and governance (ESG) grounds.

The funds, managed by their strategic partners State Street Global Advisors (SSgA) and BlackRock, track new benchmarks, which reflect exclusions policies, aligned with Scottish Widows' own policy introduced in 2020. The new benchmarks are amended versions of existing FTSE indices. They incorporate all of the stocks in the original indices, for example the FTSE All-Share, minus the excluded stocks.

Companies excluded from the indices include those that are severely violating international standards in relation to human rights, labour rights, the environment and corruption, known as the UN Global Compact (UNGC), controversial weapons manufacturers and those involved in thermal coal or oil sands.

## Flexible benefits

In addition to the pension contributions, employees are also offered a range of flexible benefits each year, against which they can obtain individual and family cover including income protection and life assurance. Within the UK, there are a number of salary sacrifice schemes for employees including an electric vehicle scheme for employees to lease a new electric vehicle and a cycle to work scheme where employees can obtain finance and discounts on new bikes including electric options.

## Employee health and wellbeing

Employee health and wellbeing remains a keen priority for the Group.

In line with this approach, the businesses within the Group have prioritised different initiatives that best reflect their workforce, such as volunteering and employee wellbeing policies, regular wellbeing weeks, step challenges, weekly Yoga sessions, qualified mental health first-aiders and other activities to encourage and promote a healthier workforce.

As part of the Flexible Benefits programme, employees have access to:

- **Health Shield**, a health benefit solution offering access to discounts and reimbursement of healthcare costs such as dentists, opticians, physiotherapists and health checks.
- **Fitness**, employees can pay for gym membership or gain access to gym discounts via a website, that also offers discounts on items such as fitness trackers, experience days and sports clothing.
- **Wellbeing** via an **Employee Assistance programme**, a positive preventative programme of information, advice and services that can help individuals deal with events in their everyday work and personal life, including bereavement assistance, manager consultation and coaching, and immediate crisis intervention, through telephone counselling teams 24/7.

## Training, development & retention

Developing our talent is key to our on-going success, and in 2022 we will recruit a Learning & Development Manager to support the organisational plans and to identify enablers that can drive the attainment of employees aligned with the business requirements.

- An updated suite of Learning and Development tools is being developed to ensure key skills are developed and enhanced.
- Internal courses are developed in conjunction with the Institute of Learning and Management (ILM) to support key manager development.
- A new graduate and apprenticeship programme was launched in 2021.

The Group operates an online performance management and appraisal system providing opportunity for individual discussions on training needs and career planning. This is supported by a talent management and succession planning process from which the Executive Management Team assesses the outcomes, formulates action plans and reviews progress.

The Board is kept informed of the results. The loss of key personnel is identified by the Board as a key risk and is set out in further detail in the principal risks and uncertainties table on page 44. Voluntary labour turnover was 5.5% across the Group in 2021 (2020: 3.6%)

## Our people response during the pandemic

During the COVID pandemic the safety and wellbeing of our employees has been and continues to be our overriding priority. Our executive and senior management teams have monitored events closely to ensure that we have been able to react quickly to an ever-changing situation. At the start of the pandemic we enabled working from home at short notice for those who were able to do so, and in the workplace we took actions to introduce enhanced hygiene and social distancing measures, screens, temperature checks, use of face coverings and more recently workplace lateral flow testing.

The Board recognises the commitment of the Group's employees demonstrated through the coronavirus pandemic as they responded with great agility and dedication to the new ways of working required.

## Innovation

**Xaar recognises that innovation is key to achieving many of the sustainability goals across all four pillars that support our Sustainability Roadmap. For 30 years, we've been reinventing inkjet and reimagining what's possible for printheads.**

## Sustainable product development

Encouraging more sustainable approaches to design, manufacture, technology and collaboration across the whole product lifecycle.

In 2021 we relaunched the Product Lifecycle Management process used to develop new and innovative printhead products; this now includes Design for Environment as part of the development considerations. Eco-design is the systematic application of environmental lifecycle considerations at the product design stage. The aim of eco-design is to avoid or minimise significant environmental impacts at all stages of the lifecycle of a product, from sourcing of raw materials and purchased components, design and manufacture, to distribution, use and end-of-life disposal.

## Precautionary principle

The Company supports the precautionary principle by avoiding materials and production methods that pose environmental and health risks when suitable alternatives are available.

Xaar continues to review changes in the Restriction of Hazardous Substances Directive (2011/65/EU). As a result we are working hard to eliminate Substances of Very High Concern (SVHC) from the manufacturing process.

### Resource efficiency

The Company products and processes are designed in such a way that energy and raw materials are used efficiently and waste and residual products are minimised over the products lifecycles.

As the COVID impact on the electronics supply chain became clear in 2021, Xaar implemented a circular and resource efficient approach to the recovery of key electronic and piece parts from printheads that do not meet our high standards. This innovative approach, along with considerable sourcing efforts, has allowed us to continue production despite global shortages.

### Environmental performance

The Company routinely audits, follows up and reports on its environmental performance, with particular emphasis on evaluating the potential risks of present and future products and operations.

### Product quality

We issued a number of Technical Bulletins throughout the course of 2021, advising customers on product updates, system improvements and product end of life announcements. No product recall was initiated in 2021, however we did complete a recall initiated in 2020. 18 XPMs were recalled from the field to enable replacement of a defective chip installed in error by a supplier that had the potential to unexpectedly halt the XPM operation. Advanced replacements were made available to all customers affected to minimise the impact on their production or research.

## Community

**Xaar is proud to play an active role in the communities in which it operates. As part of our commitment to social value and community we have an active programme of sponsorship for projects and initiatives that are aligned to our business values.**

Xaar sponsors an Imagineering Clubs within a local primary schools. Imagineering Clubs are designed to introduce children to engineering through fun activities.

The sponsorship is part of Xaar's role in helping to create the 'engineers of the future' and drive interest in STEM subjects ('Science, Technology, Engineering and Mathematics') amongst school students. During 2020/21 the impact of COVID meant the clubs were held less frequently than previous years. Xaar is delighted that the clubs, and our support have restarted with the onset of the 2021/22 academic year.

For our own employees, the social club, which is aimed at encouraging staff to have fun and get to know each other socially, was paused during 2020 as a consequence of COVID restrictions. Activities have restarted as COVID restrictions allowed from H2 2021.

### Volunteering

The Company recognises the benefits to Xaar, our employees and to the wider community of a framework within which volunteering can take place. Managed well, volunteering can raise our profile within the community and support our social responsibility plans.

Xaar supports employees' voluntary work/ activities by providing 'holiday matching' of up to two and a half days a year. We believe this will help them get involved in their community, support employee mental health and wellbeing through positive activities and additionally assist them in developing new skills and hone existing ones.

- Of the 1,000 trees purchased as part of the carbon offset (see environment section page 30), Xaar employees volunteered to assist with the planting of 100 trees at two local schools, assisting Year 2 children to plant 90 hedging plants at one of these schools.
- Xaar has donated and grant matched time off to an employee in 2022 to travel overseas and support construction of a school / facilities building in Africa.

### Charities

Xaar contributes annually to charitable causes through three funds:

- A chosen charities fund: these should be charities that provide benefits locally, or charities with specific connection to Xaar staff:
  - Xaar employees usually raise money during the year for a number of charities, previously taking part in various activities for Comic Relief on Red Nose Day, coffee mornings for Macmillan Cancer Support and Christmas Jumper Day for Save the Children. Unfortunately due to the coronavirus pandemic in 2021 we were unable to participate in charity fundraisers this year. Charity nominations took place with Hinchingsbrooke Special Care Baby Unit receiving a donation of £2,000 in January 2021.

- A Sponsorship fund: for staff and their families engaging in charity events or team activities, Xaar will provide up to £100 towards an event (e.g. charity golf days, sporting events, donations to community foodbanks) or team sponsorship. Wherever possible the Xaar logo should be incorporated (e.g. in a team sports kit). There is a fixed annual budget to cover all sites.
- A Central fund: Xaar will donate monies as appropriate to disasters and emergencies or other local causes not covered by the other funds. This will be at the discretion of the Executive team.
- In total, the Group made charitable contributions to local and national charities during the year totalling £5,060 (2020: £3,150).

### Charitable sponsorship

- In 2021, Xaar became an official supporter and sponsor to the 'Cows about Cambridge' event ([www.cowsaboutcambridge.co.uk](http://www.cowsaboutcambridge.co.uk)), becoming a headline sponsor of the Farewell Weekend (2021: £6,000, 2020: Nil). A team of Xaar employees also volunteered to assist in preparations for and also at the event. The event was organised to raise funds for the East Anglian children's charity 'Break' to help change the lives of vulnerable young people on the edge of care, in care and leaving care ([www.break-charity.org/charity/](http://www.break-charity.org/charity/)).

### Political donations

- The Company has a longstanding global policy against making contributions to political parties, political committees or candidates using Company resources (including monetary and in-kind services), even where permitted by law.
- No political donations were made in the current or previous year.

### Taxation

We aim to manage our tax affairs in accordance with national legislative provisions and within the guidelines set down by the Organisation for Economic Cooperation and Development (OECD). Our objective is to structure our operations tax efficiently and take advantage of available incentives and exemptions provided by governments for eligible capital investments, R&D and similar expenditure.

We do not enter into any artificial tax arrangements.

We have not received any fines or penalties from any government tax agencies.

 **See Financial Statements – note 12 on page 137**

# Sustainable and responsible business continued

## The initial core recommendations

Progress against initial actions in 2021:

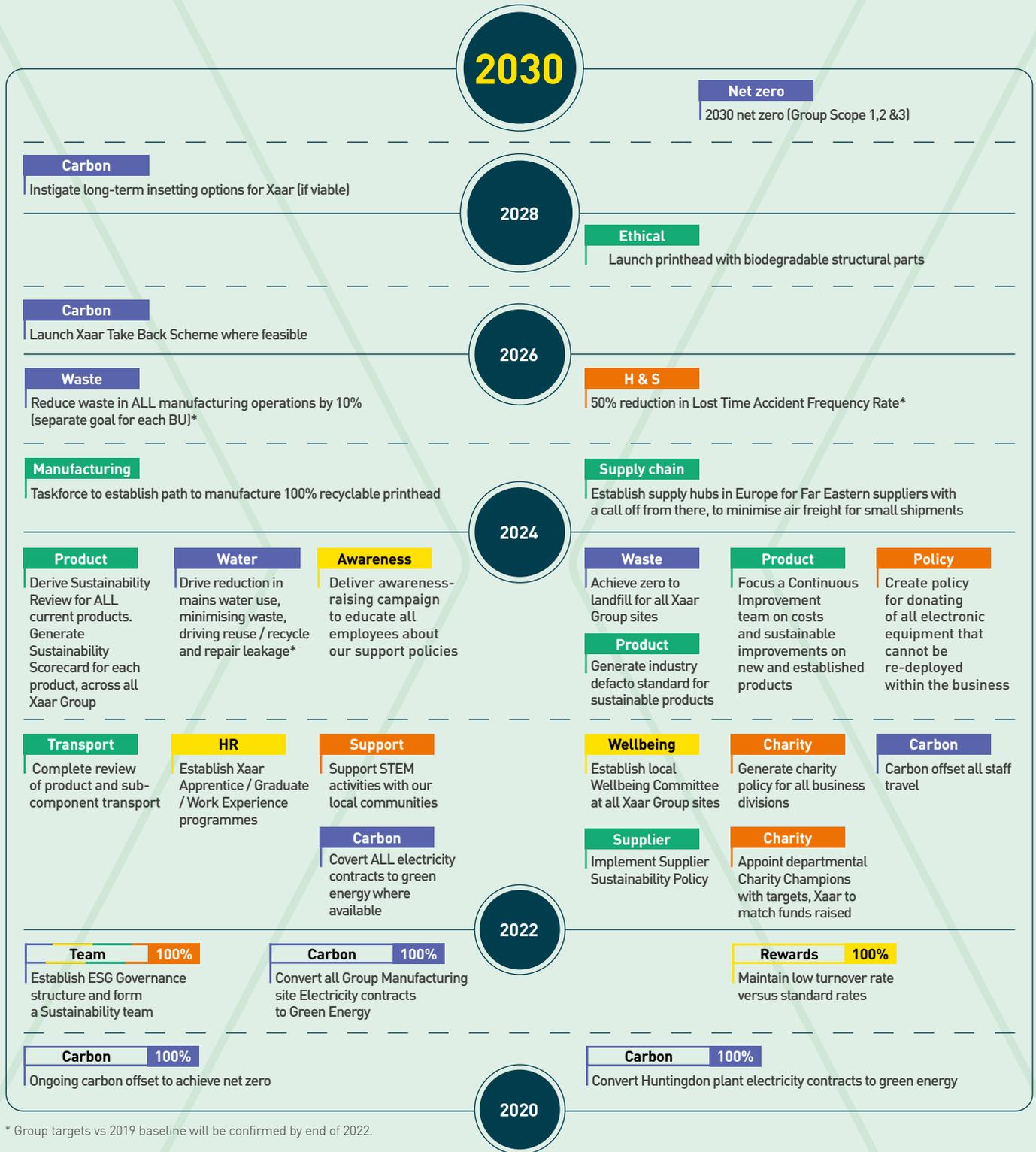
● Achieved ● Work ongoing

Initial action from 2020	Progress in 2021
Offset all of the UK regulatory Scope 1 and 2 carbon impact that we made and reported in 2020.	See: Carbon offset: Based on our carbon footprint reported in 2020 this makes Xaar a carbon neutral inkjet manufacturer. Carbon offset to continue in 2022 with an investigation to identify the inclusion of Scope 3 emissions for future offset.
Identify targets and metrics applicable to Xaar, to measure across the organisation.	Work ongoing – as part of TCFD requirements to identify Science Based Targets.
Preparation and identification of Scope 3 emissions within the supply chain – Identify tier 1 suppliers and their disclosures around climate change and GHG emissions.	Work ongoing – to address with tier 1 suppliers. Initial Scope 3 emissions for travel in 2021 identified for offset in 2022.
Review product return policy, to identify possibilities for improvements in responsible consumption in production and remanufacturing of products, reduction in plastic use, reclaiming raw materials, recovery of any heavy metals, copper, lead etc.	Identified as part of Sustainable Roadmap activities by committee actions to take place as part of sustainable product development and circular economy – actions to be defined.
Set, measure and disclose a zero waste to landfill target, any waste not recycled being sent to a waste to energy recovery process.	See <b>Waste</b> : UK operations certified zero waste to landfill by Veolia, with non-recycled waste being sent to waste to energy recovery.
<b>Green energy projects to identify additional energy and GHG savings:</b>	
Identify actions to remove natural gas as an energy and heat source, or replace with a renewable gas supplier e.g. biogas.	Work ongoing – Limited exposure with gas as a heat source, but working with landlord to identify and replace with electric alternative.
Electric vehicle chargers installation on UK sites and vehicle offer to employees.	Project scope finalised for installation in 2022 at HQ & Huntingdon offices. Electric vehicle options being offered to employees.
LED light installations to further reduce the utilisation of electricity.	Individual projects by location to replace lighting with LED alternatives. New HQ comprises LED lights only.
Investigate solar panel installation at Huntingdon location to generate a proportion of electricity ourselves.	Activities on solar continue with landlord discussion around installation with a contractual supply of energy to Xaar. These discussions are not complete so we do not expect any solar installation in 2022.

The ongoing objectives will be incorporated into the ESG roadmap for delivery in 2022/23.

# Sustainability Roadmap

We all need to play our part to reach our goals



\* Group targets vs 2019 baseline will be confirmed by end of 2022.

## Our Sustainability Pillars

**Environment**  
 Leading the way in environmental sustainability for the industrial inkjet technology sector.

**People**  
 An employer of choice by putting our people, their potential and wellbeing at the heart of all we do.

**Innovation**  
 Encouraging more sustainable approaches to design, manufacture, technology and collaboration across the whole product lifecycle.

**Community**  
 Actively engaging with our communities to provide practical, lasting support that benefits society.

# Task Force on Climate-related Financial Disclosures (TCFD)

In meeting the requirements of Listing Rule 9.8.6 R, the Board has concluded that:

- We comply with recommended disclosures – Governance, Risk Management
- We partially comply with recommended disclosures – Strategy (B5), Metrics (D10)
- We do not comply with recommended disclosures – n/a

Disclosures	Recommended disclosures	Response
<b>A. GOVERNANCE</b>		
<b>Disclose the organisation's governance around climate-related risks and opportunities.</b>	1. Describe the board's oversight of climate-related risks and opportunities.	<p>The Xaar plc Board reviews key climate-related risks and opportunities and oversees mitigation strategies as part of the bi-annual review of principal and emerging risks.</p> <p>Alison Littley, Senior Independent Director, has specific responsibility for ESG matters, including climate change and sustainability.</p>
	2. Describe management's role in assessing and managing climate-related risks and opportunities.	<p>Executive management receives reports from an ESG Committee whose members consist of senior managers across the Group.</p> <p>The ESG Committee meets on a quarterly basis to assess the opportunities and proposals developed by the Sustainability Working Group.</p> <p>The Sustainability Working Group meets regularly and is developing a roadmap whilst also receiving information from both the Carbon Net Zero team and Energy Efficiency team.</p> <p> <a href="#">See governance structure on page 29</a></p>
<b>B. STRATEGY</b>		
<b>Disclose the actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning where such information is material.</b>	3. Describe the climate-related risks and opportunities the organisation has identified over the short, medium, and long term.	<p><b>Short term (2021-2025):</b> We do not anticipate any significant physical risk changes over the short term. Implementation of transitional regulatory controls (e.g. carbon pricing) could potentially commence, and could affect raw material pricing, that would need to be passed onto customers.</p> <p><b>Medium term (2025-2035):</b> Mitigating the physical impact of climate change is critical because we depend on raw materials sourced from countries that are particularly vulnerable to rising seas and temperatures from changing weather patterns. We have performed high-level assessments on our business in respect of 2°C and 4°C global warming scenarios which show that without action, both scenarios represent increased financial risks by 2030, with increased risk of property damage and business disruption from e.g. flooding. Under the 2°C scenario, transition risks and mitigation actions lead to carbon pricing being introduced in key countries and hence there are increases in both manufacturing costs and the costs of raw materials e.g. plastics and the metals used in products. Change in customer expectations as more companies committed to becoming net zero and set Science Based Targets, assessing the supply chain and Scope 3 emissions.</p> <p><b>Longer term (2035-2050):</b> Under the 4°C scenario, there are likely to be significant risks arising from failure to transition, leading to significant increase in physical and adaptation risks. With significantly hotter summers (+4°C to +7.6°C), leading to increased flooding and storm losses and an expectation of significant uninsurable losses affecting financial markets and global economic growth.</p>

Disclosures	Recommended disclosures	Response
<b>B. STRATEGY continued</b>		
	<p>4. Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning.</p>	<p>In managing these financial climate-related risks our business model would not require material change, except for increasing inventory levels of components to account for transport delays arising from exceptional weather events, and to consider mitigation for potential business disruption, e.g. flood defences.</p> <p>Opportunities exist in the transition to a low carbon manufacturer, by reducing both energy usage and utilising renewable energy sources to deliver lower costs to the business. Product development will incorporate sustainability as a central objective, to transition manufacturing from a linear to a circular process and to being a process to reduce, re-use and recycle materials all to be undertaken as part of Xaar's overall Sustainability Roadmap.</p> <p> <b>See Risk Management on page 45</b></p>
	<p>5. Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.</p>	<p>We have undertaken a high level review of the likely impact of 2°C and 4°C global warming scenarios (see above) as outlined by the IPCC report issued in 2021. As part of the sustainability strategy to deliver Science Based Targets to achieve 1.5°C, an independent external climate related scenario review will be researched in 2022 to identify physical and transition risks and opportunities in delivering carbon neutral manufacturing leading to 'Net Zero by 2030'.</p>
<b>C. RISK MANAGEMENT</b>		
<p><b>Disclose how the organisation identifies, assesses, and manages climate-related risks.</b></p>	<p>6. Describe the organisation's processes for identifying and assessing climate-related risks.</p>	<p>The Group has processes in place for identifying, evaluating and managing the principal risks, which could have an impact upon the Group's financial performance. Climate change has been disclosed as an emerging risk in recent years, and has been escalated to a principal risk category in 2021.</p> <p>The Board has considered the potential impact of regulatory change that could occur in the short to medium term.</p> <p> <b>See Risk Management on pages 45 and 49</b></p>
	<p>7. Describe the organisation's processes for managing climate-related risks.</p>	<p>See above – A. Governance – Xaar has introduced a new structure to identify climate-related risks to be reported to the Board bi-annually including making decisions to mitigate, transfer, accept, or control those risks.</p>
	<p>8. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management.</p>	<p>As part of the Group's risk management, within the detailed risk register, climate-related risks are determined alongside other principal risk areas e.g. manufacturing facility, inventory and supply chain risks. The assessment is quantified via a Likelihood / Magnitude matrix to determine the overall net risk after mitigation.</p>

Disclosures	Recommended disclosures	Response
<b>D. METRICS &amp; TARGETS</b>		
<p><b>Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.</b></p>	<p>9. Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.</p>	<p>Initial metrics as outlined in 2020:</p> <ul style="list-style-type: none"> <li>• Investigate metrics and targets to be defined as part of Science Based Target initiative</li> <li>• Continuing improvement / reduction in Scope 1 &amp; 2 emissions along with intensity measurement</li> <li>• Scope 1 &amp; 2 emissions to be offset to become 'carbon neutral'</li> <li>• Scope 3 emissions recognition.</li> </ul> <p>Initial targets as outlined in 2020:</p> <ul style="list-style-type: none"> <li>• Set, measure and disclose a zero waste to landfill target, any waste not recycled being sent to a waste to energy recovery process.</li> <li>• Generation of a Sustainability Roadmap.</li> </ul> <p> <b>See page 37 for Sustainability Roadmap</b></p>
	<p>10. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.</p>	<p>GHG emissions are disclosed as per the SECR requirements for Scope 1 and Scope 2.</p> <p>An initial assessment has commenced for Scope 3 emissions, and a boundary developed.</p> <p>We have recognised Scope 3 emissions arising from employee travel and commuting; the difficulty remains in determining the supply and quality of data via upstream and downstream value chain (ongoing).</p> <p> <b>See GHG/SECR disclosure on page 41</b></p>
	<p>11. Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.</p>	<p>Xaar has committed short-term targets:</p> <ul style="list-style-type: none"> <li>• To achieve a net zero target by 2030</li> <li>• 100% renewable (green) electricity at UK facilities</li> <li>• Zero waste to landfill</li> <li>• Offset of all Scope 1 &amp; 2 Group emissions as we continue to drive reductions in energy use.</li> </ul> <p> <b>See page 36 for progress summary</b></p>

# Greenhouse gas emissions statement

**Xaar plc has calculated its global greenhouse gas (GHG) emissions statement using an operational control consolidation approach.**

## Scope 1 emissions

Scope 1 emissions occur from sources that are owned or where Xaar plc has operational control. This includes direct emissions from gas combustion in our buildings and fuel used in leased Company vehicles. Actual and estimated gas consumption data has been collected from each of the leased properties under the control of the Xaar Group, from data sources including direct meter readings, meter readings from suppliers included on invoices and estimations where required based on available information from property management suppliers and other sources. Actual mileage data has been collected from the leased Company vehicle fleet.

## Scope 2 emissions

Scope 2 refers to indirect emissions from the consumption of purchased electricity (also including any purchased heat, steam or cooling) from facilities owned or under the operational control of Xaar plc. Actual and estimated data has been collected from each of the leased properties under the control of the Xaar Group, from data sources including direct meter readings, meter readings from suppliers included on invoices and estimations where required based on available information from property management suppliers and other sources.

## Scope 3 emissions

Scope 3 emissions are all indirect emissions – not included in Scope 2 – that occur in the value chain of the reporting company, including both upstream and downstream emissions. Scope 3 CO<sub>2</sub> emissions currently represent estimated CO<sub>2</sub> emissions from travel and estimates from employee commuting. As the Group's sustainability programmes develop we will capture more of our Scope 3 emissions and aim to collaborate with the supply chain to reduce them and will disclose progress in our Annual Report. Please refer to page 30 for actions that Xaar is undertaking to offset its carbon emissions.

Assessment parameters	
Baseline year	1 January 2013 to 31 December 2013
Consolidated approach	Operational control
Boundary summary	All entities and all facilities under operational control included subject to the materiality threshold applied
Consistency with the financial statements	The only variation is that leased properties deemed to be under operational control have been included in Scope 1 and 2 emissions
Materiality threshold	Materiality has been set at Group level at 5%*
Assessment methodology	Greenhouse Gas Protocol and ISO 14064-1 (2006)
Intensity ratio	Emissions per £'000 turnover exc. royalties (2021: £58.9 million)

\* The total of any excluded emission sources is estimated to be less than 5% of Xaar plc's total reported emissions.

## Greenhouse gas emissions

		Renewable *		2021	Renewable	Non-renewable	2020 Total
		Non-renewable	Total	Total			
Global energy use	KWh	10,610,069	752,331	11,362,400	2,351,508	7,764,206	10,115,714
	%	93.4%	6.6%		23.2%	76.7%	
UK	KWh	10,205,766	472,854	10,678,620	2,351,508	7,315,782	9,667,290
Non-UK	KWh	404,303	279,477	683,780	–	448,424	448,424
<b>Absolute values</b>							
Scope 1	tCO <sub>2</sub> e	–	98	98	–	75	75
Scope 2	tCO <sub>2</sub> e	–	116	116	–	1,741	1,741
Scope 3	tCO <sub>2</sub> e	–	150	150	–	361	361
<b>Total</b>	tCO <sub>2</sub> e	–	364	364	–	2,177	2,177
– Scope 1 & 2 emissions of which UK	tCO <sub>2</sub> e	–	198	198	–	1,706	1,706
<b>Normalised values</b>							
Scope 1	tCO <sub>2</sub> e/£'000	–	165	165	–	157	157
Scope 2	tCO <sub>2</sub> e/£'000	–	198	198	–	3,655	3,655
Scope 3	tCO <sub>2</sub> e/£'000	–	254	254	–	618	618
<b>Total</b>	tCO <sub>2</sub> e/£'000	–	617	617	–	4,430	4,430

\* UK energy certified by EON, in the form of Guarantees of Origin from renewable wind sources. US energy (Green Mountain) 100% carbon free, 68% renewable (balance being nuclear).

## Historic greenhouse gas emissions

	2019	2018	2017	2016	2015	2014
<b>Global energy use KWh</b>	10,573,689	11,270,047	11,506,598	12,474,406	14,187,311	14,058,636
<b>Scope 1 – tCO<sub>2</sub>e</b>	108.3	124.8	147.7	167.0	162.2	162.0
<b>Scope 2 – tCO<sub>2</sub>e</b>	2,622.8	3,128.1	4,088.0	4,432.0	4,475.2	6,263.0
<b>Total – tCO<sub>2</sub>e</b>	2,731.1	3,252.9	4,235.7	4,599.0	4,637.4	6,425.0

# Key performance indicators

## Our progress in numbers

**We monitor progress against the delivery of our strategic goals using financial key performance indicators ('KPIs').**

The Company uses a number of alternative performance measures ('APMs') in addition to those reported in accordance with IFRS. The Directors believe that these APMs, shown, are important when assessing the underlying financial and operating performance of the Group and its divisions, providing management with key insights and metrics in support of the ongoing management of the Group's performance and cash flow. A number of these align with KPIs and other key metrics used in the business and therefore are considered useful to also disclose to the users of the financial statements.

The following APMs do not have standardised meaning prescribed by IFRS and therefore may not be directly comparable with similar measures presented by other companies.

 **See note 4 of the Group's Consolidated Financial Statements, for reconciliation between adjusted and statutory items on page 130**

2021 figures and 2020 comparative figures are based on continuing operations (where relevant), and are subject to rounding.

### Revenue

#### Statutory

# £59.3m

#### Continuing operations

Total revenue for the Group was £59.3 million, an increase of £11.2 million year-on-year (2020: £48.0 million). Revenue increased 23% year-on-year.

#### Revenue by sector £m

##### Industrial

2021	£40.8m
2020	£28.9m

##### Packaging

2021	£11.9m
2020	£12.4m

Industrial sector growth incorporates the acquisition of FFEI (£5.3 million), combined with Ceramics and Glass segment increasing throughout the year with full year revenue up 38%.

##### Graphic Arts

2021	£6.2m
2020	£6.3m

##### Royalties

2021	£0.4m
2020	£0.4m

Royalties from the single remaining licensee declined and will continue to decline in both 2021/22 before ceasing. Royalties in 2021 include a one off service fee payable by Stratasy.

#### Revenue by region £m

##### EMEA

2021	£23.7m
2020	£18.1m

##### Asia

2021	£12.0m
2020	£9.6m

##### Americas

2021	£23.6m
2020	£20.3m

The increase of revenue in Americas is primarily due to the sales turnaround in the EPS business. Performance in Asia, and China in particular, was successful with growth of £2.6 million in Printheads driven by re-engagement of Chinese Ceramic customers who began to adopt the Xaar 2001 and have now transitioned to the newly launched Xaar 2002 for their new printer builds. EMEA was slightly higher, and we have seen a promising upward trend.

## Profit

### Statutory

# 34%

#### Gross margin – Continuing operations

2021	34%
2020	27%

The increase in the gross profit for the Group can be attributed to the performance of the Printhead business. This was driven by the operational leverage in the business with increased product throughput absorbing greater costs in 2021 (2020: 27%).

# £1.0m

#### Profit (Loss) before tax £m – Continuing operations

2021	£1.0m
2020	(£4.3m)

Profit before tax represents operating profit after investment income and finance costs (2020: £4.3 million loss), and before the gain arising on sale of Xaar 3D.

# 20.9p

#### Basic earnings per share (Total)

2021	20.9p
2020	(15.2p)

The calculation of basic EPS is based on the weighted average number of ordinary shares outstanding during the period. (2020: 15.2p loss) see Financial Statements - note 14 for further information.

### Alternative Performance Measures (APMs)

# £3.2m

#### Adjusted EBITDA – Continuing operations

2021	£3.2m
2020	£0.1m

Adjusted EBITDA is defined as operating profit before separately reported items. It is one of the Group's KPIs and is used to assess the trading performance of Group businesses. It is also used as one of the targets against which the annual bonuses of certain employees are measured.

# (£0.6m)

#### Adjusted loss before tax £m – Continuing operations

2021	(£0.6m)
2020	(£3.9m)

Adjusted loss before tax from continuing operations represents the loss before tax adjusted for recurring and non-recurring items. Reconciliation of adjusted financial measures is provided in note 4 (page 130) (2020: loss £3.9 million).

# (1.0p)

#### Adjusted basic earnings / (loss) per share – Continuing operations

2021	(1.0p)
2020	(5.2p)

Earnings per share adjusted for the impacts of adjusting items and share-based payment expense. This measures the growth and profitability of the Group operations.

## Net cash

### Statutory

# £25.1m

#### Cash & treasury deposits £m

2021	£25.1m
2020	£18.1m

Cash and cash equivalents comprise cash at bank of £25.1 million (2020: 17.9 million) and short-term highly liquid investments with an original maturity of three months or less. Net cash incl. treasury deposits of £Nil (2020: £0.2 million).

# £5.2m

#### Net increase in cash and cash equivalents £m

2021	£5.2m
2020	(£4.7m)

Net increase in cash and cash equivalents was £5.2 million following a reduction in cash consumed by operating activities and after adjusting for cash movements in both investing and financing activities during the year (2020: (£4.7) million).

### Alternative Performance Measures (APMs)

# £5.7m

#### Gross R&D investment £m

2021	£5.7m
2020	£4.5m

Gross R&D investment (continuing operations) reflects the investment in the ImagineX platform (£5.7 million). 2020 investment excludes amortisation of Xaar 3D development costs and impairment of Thin Film (2020 restated: £4.5 million).

# (£2.3m)

#### Cash outflow from continuing operations £m

2021	(£2.3m)
2020	£7.1m

Net cash outflow (incl. treasury deposits) from continuing operations was £2.3 million as a consequence of increases in working capital and net cash used for investing activities before proceeds from the disposal of Xaar 3D (2020: £7.1 million).

# Risk management

## Managing our risks

### Key risk areas

The risks around our business are set out in more detail on pages 47 to 55, but the key risk areas can be identified as being associated with the following:

<b>Market</b>		Risk owner: <b>CEO John Mills</b>	
<p><b>1. Competition</b> Monitoring and adjusting to competitive dynamics such as pricing/promotion, innovation, resource investments and market share changes.</p>	<p><b>2. Identification of market requirements</b> Successfully developing products with the characteristics that meet market requirements within the necessary timescale.</p>	<p><b>3. Commercialising and maintaining products with cutting edge technology</b> Creating value by generating innovative products that deliver significant customer benefit.</p> <p><b>4. Merger and acquisition opportunities</b> Seek opportunities to expand, create synergies and generate greater shareholder value.</p>	<p><b>5. Coronavirus ('COVID-19' and variants) – External</b> Tracking and adjusting to the potential global impact and external risks arising from pandemic response and impact on customers / supply chain.</p>
<b>Operational</b>		Risk owner: <b>CEO John Mills</b>	
<p><b>6. Climate change</b> Identifying risks and scenario planning of physical and transition impact upon operations and developing mitigating actions.</p> <p><b>7. Organisational capability</b> Having the right people in the right roles.</p>	<p><b>8. Coronavirus ('COVID-19' and variants) – Internal / Company</b> Tracking the potential local impact and response to pandemic and operational internal risks on employees or organisation.</p>	<p><b>9. Brexit</b> Tracking &amp; adjusting to the impact of the Trade &amp; Co-operation agreement between UK &amp; EU.</p> <p><b>10. Manufacturing facility</b> Optimising mix of products, locations and manufacturing partners to drive performance and minimise operational issues.</p>	<p><b>11. Partnerships and alliances</b> Working with the right companies, at the right time on the right terms to deliver long-term value.</p> <p><b>12. Supply chain</b> Optimising sourcing and supply chain relationships to drive performance and minimise operational issues.</p>
<b>IT</b>		Risk owner: <b>CFO Ian Tichias &amp; Group IT Director Graeme Smith</b>	
<p><b>13. IT systems and control environment</b> Strengthen IT infrastructure and key IT systems. Enhance and build resilience by investing in and implementing new IT infrastructure or IT systems.</p>	<p><b>14. IT transformation</b> Delays in our IT transformation objectives due to poor prioritisation, ineffective change management and a failure to understand and deliver the IT infrastructure, IT systems, and business process changes required.</p>	<p><b>15. Cyber security risk</b> Loss of systems or confidential data due to a malicious cyber-attack, leading to disruption to business operations and loss of data.</p>	
<b>Financial</b>		Risk owner: <b>CFO Ian Tichias</b>	
<p><b>16. Ability to access sufficient capital</b> Ability to access sufficient capital to fund growth opportunities.</p>	<p><b>17. Customer credit exposure</b> Offering credit terms ensuring recoverability is reasonably assured.</p>	<p><b>18. Inventory obsolescence</b> Holding excess inventory levels when compared to demand, that leads to increased risk of obsolescence and write-off before consumption.</p>	<p><b>19. Exchange rates</b> Monitoring global economic events and mitigating any resulting significant exchange rate impacts.</p>

## Risk management

**Effective risk management is key to our success against the dynamics of the industry that we operate in and the characteristics of our chosen business model.**

### Background

Overall the printing industry is declining in terms of total output, is generally capital intensive, is slow to react to change and is resistant to the adoption of new technology. Analogue printing processes are declining rapidly particularly in areas such as Commercial print (transactional documents and publications) where electronic media and digital printing processes are becoming more widespread. In areas such as Packaging and Textiles, where analogue processes are still dominant, the conversion to digital opportunity is significant.

The digital printing market in which we operate continues to grow, with the market expected to grow from USD \$24.8 billion in 2021 to USD \$34.3 billion in 2026, at a CAGR of 6.7%. Growing demand for sustainable printing and developments in packaging and textile industries are key factors driving the growth of the digital printing markets. (Source: www.marketsandmarkets.com)

The first approach to managing these risks is to have high quality leaders and teams within the business functions that proactively monitor and adjust to risks that could impact effectiveness. Other examples of the effective day-to-day management of these risks include operating multi-functional teams to share knowledge across the business, having regular stage gates in the management of development programmes, and the regular assessment of manufacturing capacity against future potential needs.

In addition to day-to-day processes the Group's risk register is formally reviewed at senior management and Board level, including the assessment of the performance of risk management during the preceding period. The Board will continue to develop the management framework across these specific risks so that it operates effectively alongside the changing organisational structure, and will inform an assessment of the Group's principal risks throughout 2022.

### Climate change

During 2021, the senior management and Board re-evaluated the existing principal risks, and approved the escalation of climate change from an emerging to a principal risk. The Board considers that climate change has the potential to affect our business in various ways and while these may not be severe in the short term, we believe climate change-related risks are likely to have a medium and long-term impact on our business.

Notwithstanding the opportunities and threats climate change presents, the Directors have assessed that currently climate risks present no potential material adverse impact to the financial performance or position of the Group.

In 2022, we will conduct a formal assessment of climate-related scenarios to identify risks and opportunities and the potential impact of both physical and transition risks on the Group's operations, strategy and financial planning.

### Supply chain

In the past year, Xaar has navigated the COVID-related supply chain disruptions fairly well. However, there continue to be significant global supply chain risks that could worsen due to COVID and variants, tight labour markets, key component capacity and potential inflationary dynamics. A new separate principal risk has been identified.

### Emerging risks

The Board periodically reviews emerging risks, to consider and evaluate the potential impact of newly identified risks against current principal risks, and monitor developing issues. A report in Q4 2021 from Gartner highlighted the Top 5 emerging risks, and these were mapped against existing principal risks.

The Directors' views on each of the above and on emerging risks in general, were integrated into the management discussions and actions being taken on existing principal risks.

### Cyber security

Cyber risks continue to be a significant area of focus for the Group following the cyber security incident in October 2020. During 2021 we conducted further work under the IT transformation program to strengthen our IT security, focused on mitigating risks in operational technology in response to the changing dynamics and external cyber threats of new ransomware models. Work on maintaining and, where appropriate, improving the integrity of our system security remains an area of focus.

### Internal controls

In compliance with provision 28 of the 2018 UK Corporate Governance Code, the Board regularly reviews the effectiveness of the Group's system of internal control.

The Board's monitoring covers all controls, including financial, operational and compliance controls, risk management systems and internal control systems. It is based principally on reviewing reports from management to consider whether significant risks are identified, evaluated, managed and controlled and whether any significant weaknesses are promptly remedied and indicate a need for more extensive monitoring.

Following the identification of internal control weakness in EPS during 2020, an action plan was initiated in 2021 to identify and strengthen the internal and management controls. Headcount restructuring and non-cash adjustments relating to slow moving and obsolete inventory were recognised in 2021. External advisors were engaged to support the newly appointed senior management team of EPS in remediation of the gaps identified and establish a proper control environment. In addition, the external advisors also assisted management in development and execution of audit readiness to support the year end preparation of accurate financial statements and supporting documentation.

The Board has also performed a specific assessment for the purpose of this Annual Report. This assessment considers all significant aspects of internal control arising during the period covered by the report. The Audit Committee assists the Board in discharging its review responsibilities.

Emerging risks	Principal risk response
1. New ransomware models	14. IT cyber risks – remote working security risks
2. Post-pandemic talent	7. Organisation capability – retention & recruitment
3. Endemic COVID-19 and variants	8. Internal COVID-19 risks & 5. External COVID-19 risks – further variants
4. Supply chain disruptions	5. External COVID-19 risks & 12. Supply chain
5. Hybrid workforce disparities	7. Organisation capability – engagement, development & conduct

# Risk management continued

## Compliance

The Board has applied principle O of the 2018 UK Corporate Governance Code by establishing a continuous process for identifying, evaluating, and managing the significant risks the Group faces which has operated throughout the year and up to the date of this report. The internal control and risk management system is designed to manage rather than eliminate the risk of failure to achieve business objectives and can only provide reasonable and not absolute assurance with respect to the preparation of financial information and the safeguarding of assets against material misstatement or loss.

This also complies with FRC guidance on risk management, internal control and related financial and business reporting (September 2014).

## Approach to risks

**The first approach to managing these risks is to have high quality leaders and teams within the business functions that proactively monitor and adjust to risks that could impact effectiveness.**

### Probability rating

The probability rating is the likelihood of an event occurring based on previous experiences, historical information and professional judgement with respect to the incident in the territory or industry. Probability can be subjective and is not an exact science. The probability of an incident occurring can be estimated to give a probability rating. This gives an overall view of the risk exposure faced by the business.

### Impact rating

The impact of an incident can be measured in terms of human suffering, damage to assets, interruption to operations or business, effect on customers, impact on reputation/brand and financial loss. The calculation of the impact rating should be taken as the worst case in respect of these categories. The financial element of the impact rating is the amount of money that is "at risk".

This "at risk" means that it is either revenue at risk, or the cost of rebuilding a system, or replacement cost of hardware. This must be taken in the context that there are limited recovery capabilities and that revenue at risk is not a daily amount, but the amount of revenue that would be lost until the process, system or business function can be reinstated.



**Key of change**

-  Increase
-  No change
-  Decrease
- NEW

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
<b>Market</b>			
<b>1. Competition</b>	<p>We compete on the basis of our technology, innovation, price, quality, reliability, brand, reputation and customer relationships.</p> <p>Failure to continually improve in these areas may mean that we lose market share or have to reduce prices. Since there are fixed factory costs, reductions in sales volumes may substantially lower profit margins.</p> <p>We are the only true independent printhead company in the world and we are competing with vertically integrated large scale multinational companies.</p>	<p>Competitive pricing policies are employed and product portfolios and pricing are constantly monitored. The re-alignment of our go-to-market capabilities allows us to focus more on our customers and to deliver requested products into the OEM marketplace.</p> <p>Production efficiency improvement programmes are established to ensure that cost bases remain competitive within the marketplace.</p> <p>Regular communication and sharing of information with customers and partners to enhance 'peer-to-peer' relationships. Market reports and other reliable sources are reviewed to improve demand forecasting.</p> <p>Continued investment in innovative technical solutions for development of new applications from existing technologies and launch new technologies.</p>	<p><b>Probable Very high</b></p> <p></p>
<b>2. Failure to identify market requirements</b>	<p>Products need to meet the changing demands of the market, including regulatory changes.</p> <p>Failure to meet future market requirements/specifications could impact on long-term revenue and profit.</p>	<p>Regular, specific and detailed reviews are held to assess current and anticipated market requirements, including expected regulatory changes.</p> <p>These reviews include regular customer visits between senior executives, technical experts and R&amp;D team members to develop a culture of innovation that focuses on delivering technical solutions to original equipment manufacturers' ('OEMs') requirements.</p> <p>Product developments are selected on appropriate criteria. Product development activity is properly managed with regular reviews of progress against project plans, and gated milestone reviews. We have a rigorous product lifecycle management process which ensures we deliver against our customers' requirements.</p>	<p><b>Likely Very high</b></p> <p></p>
<b>3. Commercialising and maintaining products with cutting edge technology</b>	<p>We aim to produce quality end products. Failure to meet the required quality standards could have an impact on products that have been sold or that are held in inventory.</p> <p>This could lead to:</p> <ul style="list-style-type: none"> <li>• Unexpected costs associated with resolving the issues</li> <li>• Possible warranty costs, customer compensation or write-down in inventory values</li> <li>• Potentially longer-term revenue loss if customers move to competitors and damage to reputation.</li> </ul> <p>We operate in an increasingly dynamic and changing environment. To counter the risks associated with this and, most importantly, to exploit the opportunities it presents, we must embrace innovation, protect our Intellectual Property and capitalise on technology advancements to ensure we grow our market position.</p>	<p>The quality of supplies is constantly monitored. Quality performance is regularly reviewed by senior management who apply appropriate resources to systematically address recurrent problems. New products are thoroughly tested before launch.</p> <p>Xaar's manufacturing facilities are ISO 9001 accredited. Customer returns are reviewed quickly using a consistent and thorough investigation process.</p> <p>Warranty costs, RMA and customer return costs are reviewed and compared against forecast to highlight unexpected costs, and identify root cause for corrective action. We will continue to focus on product innovation.</p> <p>This is evidenced by our continued focus on R&amp;D spend and the number of new products brought to market.</p>	<p><b>Probable High</b></p> <p></p>

## Risk management continued

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
<b>Market</b>			
<b>4. Merger and acquisition opportunities</b>	<p>Our strategy is predicated primarily on organic growth.</p> <p>Failure to realise the expected benefits of an acquisition or post acquisition performance of the acquired business not meeting the expected financial performance at the time acquisition terms were agreed could adversely affect the strategic development, future financial results and prospects of the Group.</p> <p>Divestments also carry risk. We may sell an asset at the wrong time, or may not realise appropriate value for the asset. Separation may be complex and, if poorly executed, may impact the wider business.</p>	<p>Full financial and other due diligence is conducted to the extent reasonably achievable in the context of each opportunity arising from acquisition or divestment.</p> <p>Integration risk and planning would be reviewed and undertaken as part of every acquisition.</p> <p>A detailed business case including forecasts is reviewed by the Board for each opportunity for acquisition or divestment.</p> <p>Use of external advisors.</p>	<p><b>Likely Very high</b></p> <p>›</p>
<b>5. Coronavirus (COVID-19) – External</b>	<p>In the uncertain environment of a global pandemic, the impact of COVID-19 can be felt within the entire customer base and supply chain.</p> <p>We operate in a global environment with significant exposure as part of the new business model to OEM customers in China, Europe and USA.</p> <p>Any slowdown in the global economy could lead to delays in capital investment for new equipment that utilises Xaar printheads.</p> <p>Temporary disruption to the supply chain and further workplace restrictions may threaten to slow down production.</p>	<p>Whilst it is difficult for a company individually to mitigate against a global economic slowdown, taking a portfolio approach on risk factors enables Xaar to spread the risk throughout its customer base, rather than previously relying upon distribution as a business model.</p> <p>We are carefully monitoring our own supply chain and are in regular contact with our suppliers. We hold a sufficient buffer stock of critical components and at present we do not foresee any supply issues.</p> <p>Xaar has improved its customer relationships and remains close to its customers to be able to respond quickly to any slowdown; the opening of the China subsidiary will enable an agile response specifically in this market.</p> <p>Order books and manufacturing processes are closely aligned with goods manufactured to customer order.</p> <p>Newly developed printheads will enable Xaar to diversify into a broader customer base and new vertical markets.</p> <p>Scenario planning alongside stress testing and reverse stress testing to identify and develop alternative solutions, as guidance and requirements change during an evolving event.</p>	<p><b>Certain High</b></p> <p>›</p>

**Key of change**

- ⬆ Increase
- ↔ No change
- ⬇ Decrease
- NEW

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
<b>Operational</b>			
<p><b>6. Climate change</b></p>	<p>Climate change is not only a future challenge. The IPCC report in 2021 was declared a “code red for humanity”.</p> <p>The IPCC, IEA &amp; COP26 have re-enforced the changes that are required to re-wire the economy to a low carbon manufacturing one – and the climate impacts that are expected in a range of scenarios.</p> <p>The impact of Climate change can be specified as:</p> <p><b>a)</b> the physical risks that may impact the assets of the business, and cause business disruption (e.g. flooding), and extreme weather events that may negatively impact the supply chain, to the increases in temperature that will impact human activity and the global supply chain, at an extreme level this could negatively impact the global economy and cause mass emigration from emerging economies</p> <p><b>b)</b> the transition risks in managing the shift to a low carbon economy, and investment / expenditure to manage the transition and remain viable – the potential for reputation damage should the transition be poorly executed or risk of “greenwashing” if announcements are not supported by actions that are measurable.</p>	<p>Investigating and reporting on climate-related risks and opportunities in adherence to internationally accepted recommendations, such as those published by the Financial Stability Board’s Task Force on Climate-related Financial Disclosures (TCFD).</p> <p>The assessment of the risks associated with climate change can also identify opportunities that arise to help potential customers reduce their emissions and increase efficiencies by using digital printhead solutions.</p> <p><b>Physical risks:</b></p> <ul style="list-style-type: none"> <li>• Major incident plans are in place with specific provisions for areas most exposed to potential risks (flood, fires, hurricanes etc)</li> <li>• Geographic spread of the business limits the impact to our customers</li> <li>• Our sourcing strategy takes into account risks associated with our key suppliers.</li> </ul> <p>Undertake scenario planning across two climate scenarios (e.g. RCP2.6, RCP 8.5) to identify recommendations for key mitigation measures and resilience consideration, including:</p> <ul style="list-style-type: none"> <li>• Flood modelling</li> <li>• Full assessment of key climate perils.</li> </ul> <p><b>Transition risks:</b></p> <ul style="list-style-type: none"> <li>• Develop Sustainability Roadmap to deliver ‘Net Zero by 2030’</li> <li>• Outline metrics and targets in support of reducing greenhouse gas emissions and developing Science Based Targets to 1.5°C across Scope 1, 2 &amp; 3 emissions</li> <li>• Continue reducing carbon use to minimise impact, and to become a low carbon manufacturer</li> <li>• Identify “spend to save” projects that are cash generative</li> <li>• Continue GHG mitigation actions to maintain a carbon neutral position.</li> </ul> <p>Develop transparency and credibility in ‘net zero’ commitments with verifiable plans and progress in both near-term and medium-term action plans.</p>	<p><b>Probable</b></p> <p><b>Very High</b></p> <p><b>NEW</b></p>

## Risk management continued

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
<b>Operational</b>			
<b>7. Organisational capability</b>	<p>Our people remain key to our business. Ensuring the right people are in the right roles is critical to our future success and growth.</p> <p>Operations in remote locations or highly competitive markets make attracting and retaining skilled employees challenging.</p> <p>We need to attract and retain the right talent to enable achievement of our strategic aims. Failure to do this risks delivery and growth as follows:</p> <ul style="list-style-type: none"> <li>• Lack of staff to meet a specific business need or contract requirement</li> <li>• Loss of project specialisms</li> <li>• Single point of failure</li> <li>• Loss of key skills.</li> </ul>	<p>Our focus is to minimise the voluntary turnover of employees, through better hiring for fit, improved induction procedures and employee engagement initiatives.</p> <p>Launched in 2021, new corporate values (EPIICC):</p> <ul style="list-style-type: none"> <li>• Everything with Passion</li> <li>• Innovative</li> <li>• Integrity</li> <li>• Creative</li> <li>• Collaborative</li> </ul> <p>The Group reviews remuneration to ensure that the appropriate reward packages accompany a fulfilling work environment.</p> <p>Annual performance management reviews for the majority of employees to identify talent and develop key employees.</p> <p>Investment to build a learning organisation with focus on culture, reward and recognition.</p> <p>An updated suite of Learning and Development tools is being progressed to ensure key skills are developed and enhanced. Internal courses are developed in conjunction with the Institute of Learning and Management (ILM) to support key manager development.</p> <p>A new graduate and apprenticeship programme was launched in 2021.</p> <p>Campaigns to increase performance and development of communication between managers and employees to ensure alignment to Company objectives.</p>	<b>Likely Medium</b> 
<b>8. Coronavirus ('COVID-19') – Internal / Operations</b>	<p>Impact across all business operations and locations:</p> <p>Reduction in staff availability and development of commercial opportunities.</p> <p>With the continued uncertainty associated with the virus it is too early to assess the impact on the Group's financial performance.</p> <p>IT infrastructure – see 13. IT systems.</p>	<p>We had stopped all international travel and remote access and business continuity testing has been performed.</p> <p>As we enter a 'post-COVID' world, international travel will be evaluated in conjunction with a risk assessment by location.</p> <p>Employees where possible are working from home, and we have communicated sick and self-quarantine policies to all our staff.</p> <p>Employees who work from home have effective digital collaboration tools to enable continued effective communication with their colleagues, customers and suppliers; we raise employee awareness to cyber security risks and implement additional security measures related to remote working.</p> <p>There has been minimal impact upon the manufacturing operations in Huntingdon, with work being performed to new shift patterns to reduce the number of staff on site at any one time. COVID secure working practices have been introduced across all sites with handwashing, face coverings and safe working spaces being mandatory for all employees.</p> <p>The Group is debt free with sufficient cash reserves and liquidity to be able to continue operations "as-is" in the short term. The business has a proven track record for disciplined cost control, which will continue to be vital in the current trading environment.</p> <p>In 2021 no claims for furlough or job support were requested from the UK Government.</p>	<b>Certain Medium</b> 

**Key of change**

-  Increase
-  No change
-  Decrease
- NEW

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
<b>Operational</b>			
<p><b>9. Brexit</b></p>	<p>The United Kingdom’s decision to leave the European Union presents both risks and opportunities to the Company.</p> <p>The formal trade negotiations concluded at the end of 2020 and are now governed by the Trade and Co-operation agreement reached between the UK and the European Union.</p> <p>A challenge continues to be free trade into the EU. Around one third of our revenues are generated from EU countries and so any actual or perceived barriers to free trade are an obvious area of concern.</p> <p>The free movement of employees and recruitment of potential employees are key focus areas under the new arrangements.</p> <p>We remain exposed to currency fluctuations that could result from the United Kingdom’s decision to leave the EU.</p>	<p>Key managers across the business are continuously monitoring the latest political developments and putting mitigating actions in place where there may be a potential impact on Xaar or its stakeholders.</p> <p>A review of import and export tariffs identified minimum effect on the raw materials and finished goods.</p> <p>Non-tariff barriers (i.e. import/export documents) are being reviewed with our freight forwarders and couriers to ensure pro-active compliance with documentation requirements from 1 January 2022.</p> <p>Identify and support EU, EEA or Swiss employees requiring advice in completion of application to the EU Settlement Scheme.</p> <p>Xaar will become a licensed sponsor for recruitment of EU nationals. This does not apply to Irish citizens or those whose eligible status is covered by the EU settlement scheme.</p> <p>Identify talent that will meet visa requirements under existing Tier 2 conditions and/or minimum threshold criteria for skilled worker general visa.</p> <p>The Group transacts in four main currencies – Sterling, US Dollars and Euro for sales and purchases, with some additional exposure to purchases in Japanese Yen – and adopts natural hedging where possible to mitigate against exchange rate movements.</p> <p>The Group has sufficient cash resources to protect against any short-term volatility.</p> <p>The Board will assess the removal of “Brexit” as a principal risk in 2022, as the transition periods end, and are replaced by normal legislative activities that would be categorised under other principal risks.</p>	<p><b>Likely Low</b></p> <p></p>
<p><b>10. Loss of manufacturing facility</b></p>	<p>We have manufacturing facilities in the UK and the US, and we rely on our strategic partners for key products and components.</p> <p>If our manufacturing sites or our partners’ manufacturing sites were to experience an incident this could have operational and supply chain issues for the business.</p>	<p>Formal disaster recovery plans are maintained and reviewed. Appropriate precautions are taken in all factories and warehouses to safeguard against theft, fire and flood.</p> <p>Business continuity plan implemented, site access restricted, security enhanced, daily building and IT checks for security and performance.</p> <p>Given the specialised nature of the manufacturing equipment and processes there would be short-term disruption.</p> <p>We are also able to use manufacturing partners to alleviate some operational issues.</p> <p><b>2021 update:</b> Reduction versus interim report, as supply chain risk transferred to separate principal risk category.</p>	<p><b>Unlikely Very high</b></p> <p></p>
<p><b>11. Partnerships and alliances</b></p>	<p>Companies with whom we have alliances in certain areas (i.e. manufacturing/research) may already be or may become our competitors in other areas. In addition, companies with whom we have partnerships may also acquire or form alliances with our competitors, which could reduce their business with us. If we are unable to effectively manage these complicated relationships with alliance partners, our business and results of operations could be adversely affected.</p>	<p>The IP and Legal team focuses on the extensive review of legal agreements and in particular IP with such partners.</p> <p>Partnerships are constantly reviewed both internally and with those partners at the most senior level to develop long-term partnerships and supply agreements to the benefit of both parties.</p> <p>Where significant investment and research is undertaken there will be contractual arrangements to ensure appropriate governance and Board structure to support the business and product development.</p>	<p><b>Probable Medium</b></p> <p></p>

## Risk management continued

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
<b>Operational</b>			
<b>12. Supply chain</b>	<p>The Group is dependent on retaining its key suppliers and ensuring that deliveries are on time and the materials supplied are of appropriate quality.</p> <p>There has been a shift from a finished goods risk to a component materials risk particularly where components have a single source of supply.</p> <p>There are challenges with the supply of some key components that are used in production and global logistics routes have experienced some disruption.</p>	<p>Focused on monitoring and securing continuity of supply of components necessary to maintain production and the supply of printheads into 2022:</p> <p>We conduct regular audits of our key suppliers and in addition keep large amounts of safety inventory of key components, which we also regularly review.</p> <p>We also dual source our components where possible to minimise dependency on any single supplier.</p> <p>Working capital investment was undertaken in 2021 to secure the raw component materials required to meet expected 2022 production plans.</p> <p>We will design new products with multiple sources of components where possible, and identify alternative materials to build resilience into manufacturing.</p> <p>We will continue to diversify and localise our supply chains, and investigate developing a circular manufacturing approach by recovery of materials from finished goods to be re-utilised in production.</p>	<p><b>Likely Very high</b></p> <p><b>NEW</b></p>
<b>IT</b>			
<b>13. IT systems and control environment</b>	<p>COVID-19: IT network resilience and access to information via hardware and software capabilities.</p> <p>Inability to operate effectively or loss of operating capability.</p> <p>Loss of information, incurring financial or regulatory penalties.</p>	<p>Appropriate testing of the network environment, new software access (MS Teams) and allocation of laptops, monitors etc., to enable work from home and instant communication.</p> <p>Developed and communicated a new IT Vision statement and IT Strategy which are clearly aligned to our overall business objectives.</p> <p>Developed a three-year IT Transformation Programme to deliver the necessary enhancements to our IT infrastructure and IT systems. This includes investment in moving to a hybrid cloud model, strengthening the resilience and security of our IT infrastructure, rationalising and modernising our business systems, and re-aligning systems with improved operational business processes.</p> <p>Consolidating more of our critical manufacturing and finance processes into our Epicor ERP system and delivering improved engagement with our existing and potential new customers through our Salesforce based CRM platform.</p> <p>Placing increased focus on ensuring that continuity plans for critical IT systems are tested and current as the IT infrastructure and systems are changed.</p> <p>Developing the IT Service Delivery maturity and increasing capacity in the Group IT function.</p>	<p><b>Probable Medium</b></p> <p>›</p>
<b>14. IT transformation</b>	<p>Delays in transformation project to deliver the key elements of the IT Strategy and achieve the Vision for IT.</p> <p>Inability to progress sufficiently quickly to avoid disproportionate increases in the operational cost base as the business grows.</p> <p>Lack of alignment between business processes and IT systems.</p>	<p>Designed the IT Transformation Programme to deliver the three-year plan for IT which has been generated from the IT Vision and Strategy and has been aligned with three-year plans from all the key operational functions within the business.</p> <p>Established executive-level governance and oversight for the IT Transformation activities to ensure that the programme is adequately resourced, milestones achieved and to approve key rollout decisions.</p> <p>Undertaking real-time project delivery management and assurance activities throughout the Transformation Programme.</p>	<p><b>Unlikely High</b></p> <p>▼</p>

**Key of change**

-  Increase
-  No change
-  Decrease
- NEW

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
<b>IT</b>			
14. IT transformation continued		<p><b>2021 update:</b> Overall risk level reduced as a result of probability being lowered. Good project delivery performance in 2021 with all planned projects in the IT infrastructure and IT security work streams delivered to plan. Major achievement in the ERP work stream successfully delivered the highest priority project to upgrade Xaar's ERP system to the latest supported release of the software.</p>	<p><b>Unlikely High</b></p> <p></p>
15. Cyber threat and information security	<p>Inability to operate effectively or significant loss of operating capability and business disruption.</p> <p>Unauthorised access to data, breach of information security and data protection regulations incurring financial penalties from regulators.</p> <p>Reputational impact, business disruption and potential deterioration in customer relationships.</p> <p>Potential loss of Intellectual Property or exposure of commercially sensitive information.</p> <p>Extensive resources expended in responding to security incidents and recovering from them. IT security breaches or disruption (loss of network), unauthorised access or mistaken disclosure of information.</p>	<p>Implemented a Multi-Factor Authentication solution for VPN to reduce the likelihood of remote attacks. MFA rolled out across all key systems in 2021, including CRM and HR systems.</p> <p>Established incident response and business contingency plans were in place and have been strengthened following the cyber breach in October 2020.</p> <p>Strengthened our Enterprise Backup Solution by incorporating a third immutable copy of all system data in a secure public cloud environment.</p> <p>Prioritisation of infrastructure and systems rationalisation to reduce the available attack surface for malicious cyber attackers.</p> <p>Implemented a risk-based security testing approach across IT infrastructure and systems to identify ongoing vulnerabilities and prioritise remediation.</p> <p>Inclusion of a security work stream in the IT Transformation Programme, with an in-depth externally conducted IT Security Assessment.</p> <p>IT Service maturity and increased capacity in the Group IT function will enable us to enhance our security operations capability.</p> <p>Employees are trained on the risks of phishing and best practices for IT, a new training and education programme for information security will be introduced in 2022.</p> <p>Access to information is only provided on a "need-to-know" and "least privilege" basis consistent with the user's role and requires the appropriate authorisation.</p> <p><b>2021 update:</b> Overall risk level reduced as a result of probability being lowered.</p> <p>Whilst the general prevalence of cyber-attacks has increased during the last 12 months, we have made good progress in strengthening Xaar's IT security and reducing the number of vulnerabilities that malicious attackers could exploit.</p> <p>External IT security consultants (Claranet) were engaged in 2021 to perform penetration tests to assist in the identification and resolution of any remaining vulnerabilities in the network.</p> <p>A review will be undertaken in 2022 as to the benefits of ISO 27001 certification as part of the IT security stream.</p> <p>The Board receives regular updates on the IT Transformation Programme and cyber security risks. The Board will continue to assess progress in the IT security stream in 2022.</p> <p>The Board has assessed the IT security risk based on the above and deferred introducing specific cyber security insurance in 2021; this is subject to annual review by the Board.</p>	<p><b>Probable Medium</b></p> <p></p>

## Risk management continued

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
<b>Financial</b>			
<b>16. Ability to access sufficient capital</b>	<p>Our ability to access sufficient capital/liquidity may restrict growth opportunities for our organisation, as well as the strategic plan and vision.</p> <p>Significant investment is required to bring new products to market and ramp up to meaningful volumes.</p>	<p>The Group has sufficient cash available for execution and delivery of the strategy within agreed timescales.</p> <p>The Group has implemented cost reduction actions to focus resources on key initiatives and to achieve break even under current volume requirements.</p> <p>In order to continue to fund our research and development activities and to realise the full potential value of our product portfolio we are seeking strategic investment partners.</p>	<p><b>Probable High</b></p> <p>›</p>
<b>17. Customer credit exposure</b>	<p>The Group may offer credit terms to its customers which at times could be extended beyond what is considered normal terms for products in early stages of their lifecycle. The Group is at risk to the extent that a customer may be unable to pay the debt on time, thus impacting working capital.</p>	<p>This risk is mitigated by strong ongoing customer relationships, close monitoring of product launches by the customer in the marketplace and by credit insurance in certain jurisdictions.</p> <p>Monitor overdue receivables and manage credit limits prudently. Close management of overdue debtors and use of credit holds to encourage payment.</p> <p>The business model has moved away from a distribution model, to being a direct supplier to OEM manufacturers, which reduces the future risk being contained in a limited number of large transactions to a wider breadth of supply across a consistent sales order pipeline.</p> <p>New OEM customers are being onboarded with favourable payment terms depending upon credit assessment and review of credit history. Where there is exposure to Chinese manufacturers payments in advance may be requested.</p>	<p><b>Probable Medium</b></p> <p>›</p>
<b>18. Inventory obsolescence</b>	<p>Holding too much inventory increases the risk of obsolescence, theft and other costs of holding stock. Furthermore, working capital restrictions created by excess inventories could affect Xaar's liquidity or prevent investment in new products or identified future acquisitions.</p> <p>Conversely, too little inventory risks stock outs, missed sales opportunities and ultimately damage to Xaar's reputation.</p> <p>Insufficient buffers in raw materials increase Xaar's exposure to supply chain issues – particularly during times of economic uncertainty (see Brexit) or health emergencies (see COVID).</p>	<p>Put in place appropriate stock holding policies, ensuring these are reviewed frequently and change dynamically in line with market/business conditions.</p> <p>Identify and write off obsolete or slow moving stock items, review work in progress to determine profitability of contracts and revenue recognition for EPS.</p> <p>In 2021 a review of inventory recorded in EPS was undertaken as part of the improvements to internal and management controls, leading to the non-cash adjustments for writing off historic inventory values. Improvements have been made to management controls relating to the costing of projects and physical stock counts.</p> <p>Enforcing lead times for customer orders to ensure we have the most accurate forecast in place as far out as possible.</p> <p>Continually develop forecasting techniques so that stock requirements can be predicted with great accuracy.</p> <p>Ongoing supplier negotiation to reduce minimum order quantities to prevent obsolescence and inflated inventory.</p> <p>To minimise the potential impact of supply chain disruption arising from economic uncertainty, inventory levels for components have been increased to provide sufficient availability for production plans in 2022.</p>	<p><b>Likely Medium</b></p> <p>›</p>

**Key of change**

-  Increase
-  No change
-  Decrease
- NEW

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
<b>Financial</b>			
<p><b>19. Volatility in exchange rates</b></p>	<p>Global economic events and uncertainty may cause currencies to fluctuate and currency volatility contributes to variations in our sales of products and services in impacted jurisdictions.</p> <p>The Group is exposed to currency transactional risk relating to day-to-day sales and purchases across GBP, USD, and EUR.</p> <p>Reported results of overseas subsidiaries are subject to translational risk which may cause volatility in earnings and the balance sheet.</p> <p>The risk is that there could be significant adverse movements in currencies which cause a foreign exchange loss, reducing profit.</p>	<p>We take a balanced view of this risk as the risk arises as a direct result of our global presence, but our geographic spread means we are not wholly dependent on any one currency.</p> <p>There is a partial natural hedge for foreign currency movements, with sales companies and manufacturing spread across the globe.</p> <p>Consideration of exchange rate movements in the manufacturing operations.</p> <p>Cash flows are constantly reviewed and action is taken when appropriate.</p> <p>We may enter forward cover contracts in line with the Group Treasury Policy on hedging foreign currency exchange movements.</p> <p>See 'Brexit' risk above for further disclosure.</p>	<p><b>Likely Low</b></p> <p></p>

# Non-financial information statement

This Annual Report contains the information required to comply with the Companies, Partnerships and Groups (and Non-Financial Reporting) Regulations 2016, as contained in sections 414CA and 414CB of the Companies Act 2006. The table below provides key references to information that, taken together, comprises the Non-Financial Information Statement for 2021.\*

Reporting requirement	Group policies that guide our approach	Information and risk management, with page references
<b>Environmental matters</b>	<ul style="list-style-type: none"> <li>Environmental Policy Statement</li> <li>Environmental Sustainability statement</li> <li>Health &amp; Safety Policy statement</li> <li>Quality Policy statement.</li> </ul>	<ul style="list-style-type: none"> <li>Risk management &amp; principal risks, pages 44 to 55</li> <li>Sustainable and responsible business, pages 28 to 37</li> <li>Section 172 statement, page 69</li> <li>Company Purpose, page 71</li> <li>Our business model, pages 8 to 9</li> </ul>
<b>Employees</b>	<ul style="list-style-type: none"> <li>Absence Policy</li> <li>Alcohol &amp; Substance Abuse Policy</li> <li>Annual Leave Policy</li> <li>Bullying &amp; Harassment Policy</li> <li>Capability Policy</li> <li>Code of Conduct</li> <li>Covid-19 Policy statement</li> <li>Disciplinary Policy</li> <li>Equal Opportunities Policy</li> <li>Family Leave Policy</li> <li>Flexible Working Policy</li> <li>Gender pay gap report</li> <li>Gifts &amp; Entertainment Policy</li> <li>Grievance Policy</li> <li>Health &amp; Safety Policy</li> <li>Performance Planning Policy</li> <li>Referral &amp; Reward Policy</li> <li>Retirement Policy</li> <li>Whistleblowing Policy</li> <li>Working time regulations.</li> </ul>	<ul style="list-style-type: none"> <li>Risk management &amp; principal risks, pages 44 to 55</li> <li>Sustainable and Responsible business, pages 28 to 37</li> <li>Section 172 statement, page 69</li> <li>Company Purpose, page 71</li> <li>Our business model, pages 8 to 9</li> </ul>
<b>IT, cyber security &amp; data protection</b>	<ul style="list-style-type: none"> <li>Confidential Information Policy</li> <li>Data Protection Policy</li> <li>Email and Internet Policy</li> <li>Mobile Phone Policy.</li> </ul>	<ul style="list-style-type: none"> <li>Risk management &amp; principal risks, pages 44 to 55</li> </ul>
<b>Social matters</b>	<ul style="list-style-type: none"> <li>Human Rights Policy</li> <li>Charitable Donations Policy</li> <li>Employee Volunteering Policy.</li> </ul>	<ul style="list-style-type: none"> <li>Sustainable and responsible business, pages 28 to 37</li> </ul>
<b>Respect for human rights</b>	<ul style="list-style-type: none"> <li>Human Rights Policy</li> <li>Sanctions Policy</li> <li>Modern Slavery Policy</li> <li>Modern Slavery Act Compliance Statement.</li> </ul>	<ul style="list-style-type: none"> <li>Risk management &amp; principal risks, pages 44 to 55</li> <li>Sustainable and responsible business, pages 28 to 37</li> <li>Section 172 statement, page 69</li> <li>Company Purpose, page 71</li> </ul>
<b>Anti-corruption and anti-bribery matters</b>	<ul style="list-style-type: none"> <li>Anti-Bribery &amp; Corruption Policy</li> <li>Anti-money Laundering Policy</li> <li>Conflict Materials Policy</li> <li>Corporate Criminal Offence Policy</li> <li>Employee Share Dealing code</li> <li>Gifts &amp; Entertainment Policy</li> <li>Whistleblowing Policy.</li> </ul>	<ul style="list-style-type: none"> <li>Risk management &amp; principal risks, pages 44 to 55</li> <li>Sustainable and responsible business, pages 28 to 37</li> <li>Our business model, pages 8 to 9</li> <li>Section 172 statement, page 69</li> <li>Company Purpose, page 71</li> </ul>
<b>Description of the business model</b>		<ul style="list-style-type: none"> <li>Our business model, pages 8 to 9</li> </ul>
<b>Description of the principal risks in relation to the above matters, including business relationships, products and services likely to affect those areas of risk, and how the company manages the risks</b>		<ul style="list-style-type: none"> <li>Risk management &amp; principal risks, pages 44 to 55</li> <li>Sustainable and responsible business, pages 28 to 37</li> <li>Climate change, pages 29</li> </ul>
<b>Non-financial key performance indicators</b>		<ul style="list-style-type: none"> <li>Sustainable and responsible business, pages 28 to 37</li> <li>Greenhouse gas report, page 41</li> <li>Key Performance Indicators, pages 42 to 43</li> </ul>

\* The policies listed above are available to employees via our intranet, alongside corporate policies being available on our website (<https://www.xaar.com/en/about/corporate-policies/>). Compliance with our policies is monitored through the implementation of annual compliance statements, through our internal audit function, and locally by our General Managers.

# Board approval of the Strategic and Annual Reports

## Board approval

The section 172 statement forms part of this Strategic Report – please see page 69.

The Strategic Report, Annual Report and Financial Statements, taken as a whole, are fair, balanced and understandable and provide the information necessary for shareholders to assess the Company's position, performance, business model and strategy.

The Strategic Report was approved by the Board on 29 March 2022 and is signed on its behalf by:



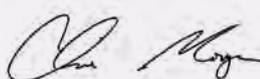
**Andrew Herbert**  
Chairman



**Alison Littley**  
Senior Independent Director



**John Mills**  
Chief Executive Officer



**Chris Morgan**  
Non-Executive Director



**Ian Tichias**  
Chief Financial Officer