SUSTAINABILITY REPORT 2023







Contents







1 Foreword

The Harvard Business School defines sustainability as doing business without negatively impacting the environment, community, or society as a whole. We need to go further and set out to have a positive effect on all these fronts.

Sustainable companies need to be profitable companies and the key to this is having a productive and engaged workforce, which is given the support and the tools needed to succeed.

AES Engineering, and its main global brands, AESSEAL[®] and AVT Reliability, work with global industry to try and improve the environmental performance of the companies that create the goods and services that make modern society tick. For this to succeed, we must also show that we can help them to be more efficient, reliable, and profitable.

The Group's sustainability strategy is built on three core pillars:

- 1. Sustainable Operations
- 2. People and Wellbeing
- 3. Innovation for the Future

One of the highlights of our section on Sustainable Operations is a detailed account of our journey towards Net Zero on direct, indirect and supply chain energy use. Check out the Appendices for detailed charts and numbers.

We are proud of this effort and remain committed to addressing the needs of the planet for the sake of our children and grandchildren, whether within or beyond the official frameworks that are adopted.



When we embarked upon this journey there were no widely recognized mechanisms for a company to be certified as Net Zero because of the difficulties of dealing with the carbon penalty due to energy use in the supply chain.

We were pioneers in deciding to calculate this penalty and have used as a counterbalance the calculation of savings in the carbon footprint of our customers due to the use of our products in the marketplace. All our figures were audited by BSI, which published a case study of AES Engineering's journey to achieve Net Zero on all scopes.

There is now a proposal by the International Standards Organization (ISO) to replace this kind of logical calculation of total impact by 2026 by directly removing carbon from the atmosphere via Carbon Capture and Storage (CCS) or by forestry.

Unfortunately, there is currently no workable CCS and there is not enough land to plant the trees needed (even though we love trees and are investing in forestry). This makes the option of market-based purchase of potentially discredited offsets to compensate for energy use in the supply chain, the only route open under these proposals.

We believe that companies cannot just buy their way out of their responsibility to the environment by using poor quality offsets. Since offsetting has already been widely condemned due to the doubtful benefit of some schemes, AES Engineering will continue to be open about our approach and our calculations and intends to stick by the methodology we have developed and push for its wider acceptance.

In parallel we will continue to reduce our direct and indirect energy use and develop our own offsets, including via forestry and any other workable mechanisms, so we can directly control the quality and the impact. We will also use our purchasing power and market presence to encourage suppliers and customers to reduce their carbon footprints, even when this is neither easy nor popular.

I believe that no business leader sets out to harm our planet knowingly. Yet the scale and complexity of modern organizations often obscure the direct impact of our decisions on the environment.

We will try to make that impact clearer while also doing the best for our customers and suppliers, helping them on a more sustainable journey, as well as assisting them to become more productive, reliable, and responsible in their operations.

Chris Rea, CBE, DL, BSc, CEng, HonFIMechE AES Engineering Group, Managing Director

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2 Sustainable Operations



When AES Engineering Ltd started operations with just five staff in a Rotherham workshop over 40 years ago we set ourselves the Big Hairy Audacious Goal (BHAG) of becoming 'the world's largest manufacturer of mechanical seals.'

In reaction to the growing climate crisis the global group, now with more than 2,000 employees and operations in more than 100 countries, underwent a radical rethink in 2020, partly influenced by experience during the Covid pandemic.

> Having a BHAG (pronounced Be-Hag), is a concept developed in the book Built to Last, by James C. Collins and Jerry I. Porras, drawing upon a six-year research project at the Stanford University Graduate School of Business. A BHAG is big enough to be frightening but clear and believable enough to inspire. Examples include the NASA moon mission of the 1960s, or Microsoft's goal of 'A computer on every desk in every home'.

We doubled down on cutting our own carbon footprint where we can via solar panels, battery storage, electric vehicles and other conservation measures. We also began to actively encourage our supply chain to work more cleanly, and set out to help customers be more sustainable.

AES Engineering's business model is to work with major global industries to help them improve their reliability and sustainability. We make mechanical seals, bearing protection, water management systems, and provide monitoring and reliability advice etc. in challenging industrial environments.

As the fourth largest global manufacturer of mechanical seals and one of the strongest players in the 'reliability' sector, which advises industry on how to make industrial processes more reliable and ultimately more sustainable, AES Engineering's board decided that the group was uniquely placed to influence industry's attitude towards environmental investments.

In the spirit of this new age, instead of the original goal of being the biggest, the group set out a new Big Hairy Audacious Goal:

"To become the leading global reliability business, delivering solutions to help industry save water, energy, cut pollution and create a better world".

In line with this new vision, we set out to become a trusted source of information for all industry, whether or not they were currently our customers.

As a result, the AES Engineering Group's dedication to fostering a safe, ethical, and community-oriented workplace while minimizing our environmental footprint and engaging stakeholders became even more central to our mission.

This section outlines our commitment to sustainability and our journey to become one of the first major global engineering companies to achieve Net Zero on all three Scopes (direct, indirect and supply chain energy use).















Benefits of sustainability

In today's socially conscious landscape, both our customers and employees place great importance on corporate governance and sustainability.

In 2020, AES Engineering began to advocate even more actively for global warming prevention strategies through the launch of Betterworld.Solutions. This knowledge-sharing initiative, mainly driven by volunteer effort in member organizations, encourages businesses to adopt environmental policies and share success stories of emission reductions and cost savings with their customers. At present 24 organizations take part as Betterworld.Solutions members, ranging from small and large UK companies to the Japanese machine tools giant, DMG Mori.

Betterworld.Solutions serves as a vehicle for environmental campaigning with a difference, aiming to influence directors of global businesses, and encourage them to do the right thing by showing that many environmental investments can help improve reliability and profitability as well as helping the planet. While this motivation may seem somewhat cynical, it is driven by a passionate desire by AES Engineering to ensure that the business legacy for the next generation includes a planet that continues to be habitable.

In essence, Betterworld.Solutions is a crusade to encourage businesses to adopt a policy that favors investments that make a positive impact on the environment while delivering an acceptable return on the investment.

Profit is a strong motivator and, while many additional actions are needed that cannot and should not be driven by businesses' self-interest, all positive steps towards Net Zero need to be encouraged, especially in a politicallycharged atmosphere where there are many doubters of climate change.

The Betterworld.Solutions website was launched in 2020 and encourages visitors to not only download the policy but also share on the website any examples they have of where they have helped their customers reduce their impact on the environment.



Better world. Solutions

AES Engineering Group's sustainability strategy shows how we have translated our commitment to these values into action, providing a focused and practical framework. Where applicable, we use third-party standards and accreditations to ensure rigorous control, management, and independent auditing of our actions.

By adhering to these principles and fostering a culture of innovation and responsibility, AES Engineering Group is setting out to lead by example in the pursuit of a sustainable future.

AES Engineering Group's sustainability strategy encompasses the following priorities:

- Enhancing the health, safety, and wellbeing of its employees
- Developing our people and providing high-quality employment opportunities
- Protecting the environment by reducing its own and its customers' impact
- Providing benefits to local communities, especially to those less advantaged
- Respecting human rights
- Operating in an ethical and transparent manner

In 2015, all United Nations Member States adopted the '2030 Agenda for Sustainable Development,' which outlines 17 Sustainable Development Goals (SDGs) and 169 targets to drive progress in critical areas for humanity and the planet.

AES Engineering acknowledges these UN SDGs and has identified specific goals where it can make a measurable impact. These connections will be highlighted using the symbols shown on the right.







Leading by example - Our Net Zero journey

The AES Engineering Group prioritizes sustainability in its capital investments and has published its Investment Policy to Prevent Global Warming (see **Appendix 1**) through technological changes and strategic investments. Via the Betterworld knowledge-sharing project we aim to inspire other businesses to adopt similar practices.

The company's journey towards becoming one of the first major engineering companies worldwide to achieve Net Zero on all three Scopes (direct, indirect and supply chain energy use), is one of our proudest achievements, and many Betterworld Solutions members have been inspired to follow this path.

The race towards Net Zero is not without its detractors, with claims that the concept is ill-understood, and that some efforts have been discredited by poorly organized offsetting schemes, or "greenwashing" by companies that make unsubstantiated claims.

Using the UN definition of what constitutes Net Zero, we must cut the amount of carbon emissions to a small amount of residual emissions that can be absorbed and durably stored by nature, as well as using other carbon dioxide removal measures to leave zero in the atmosphere.

However, reaching Net Zero for an individual company or organization is not well-defined. There is currently no universally recognized scheme to audit companies end-to-end on all three Scopes, with most efforts ending at Scope 1 and Scope 2, which are relatively easy to achieve with a combination of energy-saving measures backed by the purchase of the "offsets" that have been criticized in some quarters.



For this reason, we lay out in some detail how we arrived at our Net Zero target, starting with some reasonable definitions of what constitutes Net Zero for a business.

Since AES Engineering Group was inspired, particularly when it comes to the very difficult area of Net Zero on Scope 3 (supply and value chain emissions), by the UK hosting of the COP 26 climate change conference in Glasgow in 2021, it seems appropriate to look at the definition given by Scottish Enterprise, which is in line with the consensus.

'For your business to achieve Net Zero, its activities, supply chain, products and services should result in no net impact in terms of greenhouse gas emissions.

For most companies, this will require a serious effort to remove carbon from processes, as well as carefully chosen and certifiable carbon offsetting schemes that balance out any residual emissions.'

https://www.scottish-enterprise.com/learning-zone/ business-guides/net-zero-emissions-checklist-for-business



Net Zero on "supply chain, products and services" is the most difficult target to achieve, but it is also the most significant, as in our case the Scope 3 carbon footprint proved to be more than 25 times greater than that of Scope 1 and Scope 2 combined. (See **Appendix 2** and **Appendix 3**).

In what is believed to be a global first the Japanese plant of DMG Mori supplied AESSEAL® in Rotherham with energy-friendly machine tools designed to work directly at European standard voltages, avoiding a wasteful transformation step. This deal has wider significance as DMG Mori, also a member of Betterworld Solutions, is a world-leading machine tool manufacturer and they have committed to offering this energy-saving measure to other customers in Europe.









While using knowledge-sharing and the group's buying power to encourage positive change among suppliers can be successful, the supply chain carbon 'penalty' remains very significant, and for this reason is often overlooked or set aside by companies keen to emphasize their environmental credentials.

Supported by BSI, who audited the final figures, AES Engineering set out on the daunting task of calculating both the emissions created in our supply chain and the emissions avoided in our customer chain as a result of group activities. While all supply-chain emissions were calculated, in order to make the exercise do-able the calculation of emissions avoided concentrated on only a few key product areas where the environmental savings by customers were most significant.

By combining the emissions created on the supply side with the emissions saved because of group activities (details **Appendix 2** and **Appendix 3**), we achieved Net Zero on all three Scopes in 2021. Every year since, the group has documented the detailed and time-consuming work that goes into making a credible "Net Zero" claim.

This difficult journey, in some respects pioneering, has been worthwhile, not only for the planet, which desperately needs attention, but also because it has been recognized by our customer base. This is reflected both in our improved financial performance and the funding that we dedicate to environmental and social matters.

Having 'green' credentials matters, not just because it is good in its own right, but also because it increases business value. This is an important vector for sustainability as, when 'green businesses' are seen to flourish, this encourages industry to invest in the environment, and helps support the political will to achieve Net Zero for the planet.





2020: AESSEAL plc reaches UK Net Zero carbon emissions for Scope 1 and 2 emissions.
2021: AES Engineering Ltd. Group reaches Global Net Zero carbon emissions for Scope 1, 2 and 3.

To ensure transparency, we sought independent verification of our Scope 1, 2 and 3 emissions and the positive impact of our AESSEAL® Water Management Systems. Independent consultants confirmed that our total emissions for the reporting period and the emissions avoided by our Water Management Systems resulted in a net environmental benefit.

2021: AES Engineering Ltd. Group commits to invest £29 million on environmental projects between January 1, 2021 and April 1, 2029 (29by29).

2022: £7,760,206.52 invested in projects as part of 29by29.

2023: £13,104,995.31 invested in projects as part of 29by29.





3 People and Wellbeing



In many industrial regions, there is a recognized shortage of skilled engineers. The business view of training and development, starting from the top, is that this is not a cost, it is an investment.

Having a 'grow your own' culture is about taking control of a company's most important resource – the people who make things happen. It's about ensuring that new recruits share your goals and philosophies, and have the skills and attitudes that drive business success.

Group company AVT Reliability is a vital asset in achieving the group BHAG as it has a fastgrowing cadre of experts operating globally and specializes in remote sensors and cloudbased monitoring of industrial equipment. AVT has trained employees to be the most skilled condition monitoring experts globally by cross-training them in multiple disciplines, not just vibration analysis. This comprehensive approach ensures that the best reliability partners are available to help save water, energy and cut pollution in industry. As an engineering company, AESSEAL[®] relies on a steady stream of engineering talent for its future success. To inspire young people to pursue careers in engineering, AES Engineering Group actively collaborates with local schools, offering firsthand experiences at its manufacturing facilities. Additionally, the company:

- Gives talks at local schools about engineering careers
- Participates in school STEM (Science, Technology, Engineering, and Mathematics) events
- Sponsors schools to attend STEM-based competitions
- Hosts work experience programs for school students
- Provides university bursaries, with a focus on encouraging women to enter engineering

In 2023, AES Engineering Ltd engaged with 5,672 students. AESSEAL plc has recruited 265 apprentices across a range of different departments between 2017 and 2023.



In 2023, **AESSEAL®** was honored for the second time with the Princess Royal Training Award for its exceptional training and development initiatives. This follows recognition in 2022 by the Department of Education which judged us to be the top UK apprentice employer in the manufacturing sector (32nd overall in the Top 100)



MPDS Monitored Professional Development Scheme

AESSEAL plc is accredited by the IMechE to operate an MPDS scheme to train and develop engineers from technician level to Chartered Engineer status. Part of the criteria for accreditation is that the scheme must have Board level support and/or be championed from the highest level of the business. Of the 516 employees in AESSEAL plc (out of 2,010 in the group) 161 are engineers (HNC, HND and above), seven of whom are Chartered Engineers. Since its introduction, five employees have successfully completed the MPDS scheme and achieved Chartered Engineer status.

AESSEAL[®] received an official letter of confirmation from the IMechE to continue accreditation by the IMechE for the Monitored Professional Development Scheme until 2027.

AESSEAL®'s Fast Track Management Development programme focuses on graduates with high potential to create the business leaders of the future for society or the group. Mentoring and oversight is provided by a weekly meeting aimed at sharing best practice, led by the group managing director. Two of the "graduates" from this programme are group company directors, one of a £30 million and one of a £75 million business, and one of our original apprentices has also been appointed as a director of a group company.





Developing talent

AES Engineering places a high value on its employees, recognizing their crucial role in the company's operations. The company is committed to treating all employees fairly and equally, without discrimination.

We acknowledge the challenges posed by the skills gap in the industry. To address this, there is constant investment in developing our talent pool, ensuring a sustainable and skilled workforce for the future.

With an investment of over £6.5 million in apprentice training and development alone, and millions more on the other staff development schemes, AES Engineering Ltd. Group is committed to building a highly skilled and knowledgeable workforce.

Employees are given their own training programs tailored to their roles within the business.

While producing this report we identified weaknesses in our Outreach programme, particularly with the two Sheffield Universities, and as a result we will now do more to provide vacation roles, placements and first job opportunities.

These efforts have been consistently acknowledged, with AESSEAL plc maintaining the Investors in People standard since 1994. This ongoing commitment underscores the company's dedication to fostering a supportive and inclusive workplace environment while nurturing its employees' professional growth and development.

Health, Safety and Wellness

AES Engineering is committed to maintaining an exceptional working environment for all its employees, ensuring facilities are consistently highstandard and safe. Emphasizing a culture of continuous improvement has yielded positive outcomes in health and safety. Strategies such as thorough risk assessment, ongoing equipment investment, and active employee engagement at all levels have proven effective. This dedication has earned AES Engineering third-party certifications and prestigious awards from leading organizations like the British Safety Council and RoSPA.

In the UK, AESSEAL[®] initially certified to OHSAS 18001 in 2004, subsequently transitioning to the ISO 45001 standard, showcasing proactive safety management. AESSEAL[®] continued this success with its eleventh consecutive RoSPA award in 2023, while AVT Reliability[®] also earned a RoSPA Gold award the same year. Moreover, key locations globally, including South Africa and the Middle East, have attained ISO 45001 certification, reinforcing international safety standards.

While prioritizing a safe and pleasant workplace environment, AESSEAL[®] actively promotes healthy lifestyles among its staff, enforcing drug and alcohol policies across its sites.









The Wetlands Sanctuary and Tree Walk

At the Factory for the Future in Rotherham, we have created the 'Wetlands Sanctuary and Tree Walk' This development not only provides a habitat for wildlife but also features a sustainable urban drainage system that mitigates the impact on the local rivers, Don and Rother, leveraging nature's vital ecoservices.

The sanctuary includes meadow, woodland, and living-roof habitats, forming a wildlife corridor within an industrial area. This initiative has fostered a thriving ecosystem, regularly attracting lapwings, kestrels, mallards, herons, foxes, stoats, and numerous insect and invertebrate species.

The woodland areas boast hundreds of native trees at various stages of maturity, offering habitats for nesting birds, shelter for animals, and food for invertebrates. To further encourage biodiversity, we have installed owl nesting boxes and a ground-level wildlife hotel.

As part of the 29by29 commitment, the group has invested an additional £250,000 in the 'Tree Walk,' a 1km path around the site's perimeter. This area, rich with trees, flora, and fauna, provides a tranquil space for employees and visitors to relax and connect with nature. It is also an educational resource, presenting an activity trail for schools, with outdoor spaces designed for informal nature learning sessions.

Take a tour of the Tree Walk on the 360 virtual tour.









Ethical Business Practices

Ethical governance is a priority of the AES Engineering Ltd. Group. AESSEAL[®] values individuals for their capabilities, providing equal opportunities based on merit, diligence, and dedication to AESSEAL[®]'s core values.

The company embraces diversity, fostering an inclusive environment where race, religion, gender, sexual orientation, gender identity, national origin, age, disability, or other legally-protected statuses are respected without bias. AESSEAL[®] unequivocally opposes harassment, bullying, child labor, and any form of unfair treatment which undermines trust and contradicts its principles.

AESSEAL[®] condemns dishonest practices that distort markets and waste resources and rejects corruption and fraud. Employees are encouraged to report unethical conduct through multiple channels, including a compliance committee and an independent hotline provided by Expolink.

The most recent certification achieved by the business was ISO27001 for its Information Security Management System. This certification enhances AESSEAL®'s ability to securely manage information, business processes, information systems, and facilities supporting its products and services. This proactive approach underscores AESSEAL®'s dedication to maintaining high standards of information security and operational integrity.

The following policies can be found within the AESSEAL® corporate website:

- Anti Bribery & Corruption Policy: https://www.aesseal.com/en/resources/policy/anti-bribery-andcorruption-policy
- Human Rights Policy: https://www.aesseal.com/en/resources/policy/human-rights-policy
- Ethics Policy: https://www.aesseal.com/en/resources/policy/ethics-policy
- Gender Pay Gap: https://www.aesseal.com/en/resources/policy/gender-pay-gap
- Modern Slavery Policy: https://www.aesseal.com/en/resources/policy/modern-slaverystatement





Trust Champion in Business

AESSEAL[®] is a recipient of the prestigious Lord Mayor's Dragon Award for Business of Trust, a national recognition honoring companies contributing to a legacy of trusted business within the community. The award, bestowed upon AESSEAL[®] amidst a competitive field including global investment firms, international communications companies, and major banks, underscores our commitment to responsible business practices.

Supporting Our Community

Maintaining positive relationships with key stakeholders and supporting the local communities where we operate are fundamental principles for AES Engineering. We strive to be a responsible neighbor, minimizing any adverse impacts of our facilities and enhancing community benefits that outweigh any negatives. This commitment ensures long-term, stable employment opportunities and career growth for local residents, reinforcing our role as a valuable member of the community.

AES Engineering faces challenges in raising brand awareness among local residents who may not be familiar with our business. To address this, we prioritize community investment initiatives. One significant effort includes AESSEAL[®]'s longstanding sponsorship agreement with the Rotherham United Football Club stadium, which serves as a focal point for community events and activities.

In June 2023, six "Diamond Partners" - AESSEAL[®], Equisolve, Hughie Construction, IPM Group, Mears and Steelphalt - pledged their financial support to highlight Rotherham Hospice on RUFC's team strips instead of a commercial sponsor.

The hospice says that as a result it has seen a huge increase in the number of visitors to its website and social media channels, and has also received significant additional corporate support.

Stephen King, Director of Income Generation and Communications at Rotherham Hospice said: "Rotherham Hospice has never had so much exposure in the local area. We are finding that conversations about the charity are a lot easier to have with businesses and supporters, as most are now aware of who we are and what we do. Everyone at the Hospice is grateful to the Diamond Partners for making this happen.







Charitable Giving

Charitable donations at AES Engineering are conducted with strict ethical standards to prevent misuse or conflicts of interest. To bolster our commitment to local communities, AES Engineering has established several funds managed by the South Yorkshire Community Foundation. These include the AESSEAL® Charitable Trust Grassroots Endowment Fund for South Yorkshire and the AESSEAL® Charitable Trust Discretionary Fund, ensuring sustainable contributions to local causes over the years. Beneficiaries encompass a wide array of local charities, educational institutions, and youth sports clubs.

AESSEAL plc manages substantial charitable assets through the South Yorkshire Community Foundation, totaling £1.8 million (US\$2.3 million). From 2021 to 2023, over £200,000 (US\$255,000) annually was donated to local charities. Additionally, the AESSEAL[®] Lieutenancy Fund, launched in 2022 with £500,000 (US\$628,000) disbursed in five annual instalments, further underscores our ongoing support.

Overall, AESSEAL plc and AES Engineering Ltd's majority shareholder jointly contributed £4.4 million (US\$5.5 million) towards charitable and community causes from 2021 to 2023. International initiatives are excluded from this report, though noteworthy efforts include AESSEAL[®] Charitable Trust Pty Ltd in South Africa, focused on establishing libraries in underfunded schools, and partnerships with WaterAid to enhance access to safe water and sanitation in impoverished communities worldwide.

AES operations in South Africa, for instance, supported local initiatives like the Kosmos 3 in 1 Marathon, earning recognition for the 'best water point,' and continue to enhance math education through the 'My Maths Buddy' project in Sasolburg. These initiatives demonstrate AES Engineering's dedication to making a positive impact beyond business operations.









4 Innovation for the Future



Operating reliably and without unnecessary waste of resources or pollution is a major challenge for global industry, with sectors such as oil and gas, water, mining, automotive, chemicals, paper and pulp etc. often accused of only being interested in the bottom line.

AES Engineering is in the fortunate position of being able to offer products and services that help businesses operate more cleanly, reliably, and profitably. This often has a beneficial impact on the environment. However, this is not an easy sell. Engineers are notoriously reluctant to change what has worked in the past, even if this involves profligate use of natural resources such as water and energy.

We firmly believe that while these industries supply essential goods and services they can also operate more sustainably. There's no excuse for senseless waste.

AESSEAL® makes advanced mechanical seals and water management systems used in all important industries. We have invested in the equipment and expertise to get the best from the pumps, turbines and rotating equipment that are the workhorses of modern factories, mines and mass transit industries. This improves reliability, cuts pollution and saves water and energy, thereby reducing the carbon footprint of important industries. It is a fact that financial managers, directors and leaders in major industrial sectors often don't know that they are wasting money as well as damaging their expensive equipment and the environment.

All businesses, including AES Engineering, need to be profitable, or they will ultimately fail with the loss of jobs and a devastating impact on local communities. They also need to keep innovating and investing, not just in people but also in the latest technology, such as Al and robotics, in order to keep ahead of the competition and maintain the sustainable jobs that are so important for the economy.

By investing in pioneering technology and promoting environmental benefits as well as reliability and profitability, we have set out to prove that there is a better way of operating.

Our products and services

The AES Engineering Group of companies helps customers:

- Prevent leakage of products into the environment
- Reduce water and energy consumption
- Improve the reliability of their machinery and plants, thereby reducing unnecessary waste

With water becoming increasingly scarce and expensive, optimizing water use in industrial processes is crucial. Accurate water balance planning and reducing overall water consumption are critical. Traditional methods like quench and drain systems for controlling seals or gland packing often result in significant water waste. AESSEAL[®] provides environmentally focused products that minimize such waste, thereby reducing both the environmental impact of customer plants and their operating costs.

This section of our sustainability report sets out to show how our products and services are making a difference to the carbon footprint of our customers, which is in turn a key component on our own journey to become a Net Zero company.

For the **AES Engineering** Ltd (Group of Companies) AESSEAL[®] seal support systems and the STS™ mechanical seals, it has been independently verified by BSI that the emissions avoided totalled 433,879.1 tonnes of CO2e in 2023.





Investing in Plant and Technology

AES Engineering Group operates manufacturing facilities in the UK, USA, China, and India, all equipped with state-of-the-art machining technology including 9-axis and 11-axis machining centres. Our global headquarters and main manufacturing operation continues to be in the UK, in Rotherham.

In 2023, the Factory for the Future was built, bringing the total investment in Rotherham to almost £70 million. Other investments included the procurement of three fully-automated robots designed for optimal speed and efficiency without human intervention. This investment comes off the back of the first robot being procured in 2020. The innovation aims to surpass customer expectations, marking a significant advancement in operational capabilities.

The investment also paves the way for an additional £20 million of investment in the Rotherham area over the next five to ten years depending on the continued growth of our global customer base.

A total of 175,000 sq. ft. of new factory buildings have been constructed to the highest environmental standards and the existing plant is also being updated and refurbished as part of the scheme.

The group's Digital Roadmap includes substantial investment in technology to improve processes and ensure customers are best served. This includes an advanced capability allowing sales engineers to quote accurately on price and delivery at very short notice, with orders being put directly into the production schedule using smart devices.



Project spending on the Factory for the Future includes £5.8 million (\$7.5 million) of 'green-only' investment, such as solar panels, battery storage, and other energy-saving or environmental measures.

AutoStore

In line with its commitment to seamless ordering and fulfilment, AESSEAL[®] Rotherham, Mill Close, has switched to the AutoStore system, a state-ofthe-art, compact, and automated solution that utilizes advanced technology to efficiently store and dispense products.

With this innovative system, the Rotherham facility has doubled its stock capacity, managing to fit the equivalent of 17 carousels' worth of inventory into just half of the available grid space.

One of the standout benefits is the fast pickup times. The system operates overnight, positioning parts for easy access and ensuring they are ready for collection at the start of the day and reducing pick times by up to one-third.

This investment not only allows the group to deliver products faster to customers, but also significantly reduces energy consumption at our Rotherham facility.

Syed Hussain, Project Manager, says, "AutoStore's cutting-edge technology enables AESSEAL[®] to respond rapidly to changing market demands through process optimization, analytical capabilities, and scalability. It is another important step in our Digital Transformation Roadmap."









Preventing unwanted leaks, emissions and venting

AESSEAL[®] manufactures products designed to prevent the leakage and emission of potentially harmful substances. These solutions offer added value by significantly saving energy and water, enhancing the performance and lifespan of customer equipment, and reducing downtime.

We have lobbied managers and leaders in major industries such as the pulp and paper sector, urging them to stop practices that unnecessarily harm the environment, as in our "Stop the Steam" campaign.

Pulp and paper is far from being the only sector suffering from unnecessary and costly use of water. This often arises from using outdated technology as in the oil and gas sector where steam leaks in older turbines are often a problem.





Unnecessary steam leaks in the oil and gas industry are damaging the planet. Stopping this would have the equivalent impact of planting a rain forest of 100 million trees. Read AES Engineering Managing Director Chris Rea's open letter to industry executives and view General Manager Jim Hamilton's explanatory video. AESSEAL[®]'s Oil and Gas technology is used in refineries and rigs around the world. In 2023, as part of the efforts to tackle the problem of venting of damaging methane gas, particularly from older facilities, we invented new technology to eliminate or reduce both intermittent and continuous emissions, which can be retrofitted to oil and gas facilities across the world. Our EcoGuard[™] solution will be made by pump manufacturer Torishima UK in Glasgow and will work with our existing leading-edge dry gas seal technology.

Reducing Water and Energy Consumption

Industries today use vast amounts of water in their manufacturing processes, with a significant portion consumed by pump sealing systems. AESSEAL[®] has developed innovative technology that has saved large customers hundreds of millions of litres or gallons of water every year. This not only conserves water but also enhances reliability by maintaining a consistent seal environment. In some processes, closed-loop systems prevent seal flush water from entering the process fluid, reducing energy usage.

Engineers won't change what they perceive as having worked in the past without demanding proof that it is warranted. The most convincing proof is delivering greater reliability, especially when this also solves other problems such as a carbon footprint that is simply too high, or excess water usage.

AESSEAL[®]'s sealing solutions and water management systems are saving an estimated 95 billion litres (25 billion US gallons) of water annually, but only a minority of global industry is using available technology that can help save money, save water, and help save the planet.



A leading **UK** refinery that was experiencing serious steam leaks installed AESSEAL® seals across 30 turbines, saving £600,000 (\$750,000) annually. Converting all 1,100 turbines operated by this company would save more than £33 million (or \$38 million) over 5 years and cut carbon footprints by more than 150,000 tonnes, the equivalent of a forest of 3 million trees





5 Conclusion



AES Engineering Group has embarked on a major investment programme since the Covid pandemic struck, with lessons learned from that and with the growing global concern about the environment at the front of our minds.

Over 2021-2023 the group invested £66 million (\$84 million USD), in new plant, robotics, AI, and advanced end-to-end ordering and fulfilment. Over 80% of this investment was in the UK. Cloud-based monitoring of customers' machine tools delivers round-the-clock surveillance and timely intervention when needed. This helps industry avoid costly downtime and ultimately benefits the environment.

Our Factory for the Future in Rotherham opened in 2024, with the majority of the work done in the year under review in this report.



All this helps make our business more sustainable. But money alone is not going to future-proof UK manufacturing and create sustainable jobs. We also invested in our people with a 'grow your own' philosophy including apprenticeships and pump-priming initiatives such as 'Women in Engineering' with scholarships at universities in Sheffield and Belfast.

We are particularly grateful for the recognition received when we won our second Princess Royal Training Award in 2023.

Our sustainable business strategy has meant that national employment has grown to 790 and group employment to 2,010. This includes around 300 sales engineers based in North America, Australia, India and 100 other locations. These have driven sales from UK exports to well over $\pounds100$ million annually while turnover is now $\pounds261$ million.

In turn, the group pledged to invest £29 million by 2029 on environmental measures that will both help the business and the planet. A total of £16 million has been committed to date on energy saving, solar energy and planting 109,000 trees in a project called Betterworld Forestry. There's more to come.

It cannot be denied that British manufacturing is going through a difficult period with low productivity threatening the future of jobs. We are trying to show that sustainable business is also good business.

Our business model, caring for customers and for the environment, has helped AES Engineering become more profitable, and enabled us to double down on our support for the environment.

We can afford to do this, and we have a responsibility to do this and more, because we have one of the world's best engineering companies with the world's best people.

Our messages to industry are sometimes unpopular, as this often involves highlighting profligate use of the planet's resources, but we firmly believe that having a sustainability policy is simply not enough, given the challenges of climate change. What we need is sustainability action on a grand scale.

Chris Rea

Managing Director AES Engineering Group

The group pledged to invest £29 million by 2029 on environmental measures that will both help the business and the planet.





Appendix 1

Investment Policy to Prevent Global Warming

If you want to help, a good first step would be to encourage your company Board to adopt a policy with a similar spirit to 'An Investment Policy to Prevent Global Warming (PPGW)'. This policy can be considered as being freely available. There is no requirement to acknowledge any individuals in AES, or the Corporation.

Chris Rea, CBE, DL, BSc, CEng, HonFIMechE AES Engineering Group, Managing Director

Appendix 2

Emissions Avoidance:

AES Engineering Ltd. Group, through conducting a full GHG inventory inclusive of Scope 3 emissions, is aware of the wider impact outside of what would often be considered when assessing the emissions a company is responsible for. When considering the wider impact a single organization may have on emissions it is also important to consider the emissions impact the products or services sold by that company may have.

Total avoided emissions as a result of the sale of products during the reported time frame are assessed to be 433,879.1 tonnes. This is the total of avoided emissions over the entire lifespan of the products sold during this window.

Process	Total LCA Savings (Tonnes CO2e)	
Water Saving Systems	48,970.2	
Steam Turbine Seals	1,965.4	
Evaporative Processes	382,943.4	
Total	433,879.1	

For more information check out the GHG Avoidance Report on aesseal.com.



Appendix 3

Scope 1, 2 and 3 Summary 2023

Scope	Category	CO2e (Tonnes)
1	Fleet Emissions	1,687.15
1	Natural Gas	500.63
1	Other Consumed Fuels	111.87
1	Fugitive Emissions	30.69
1	Scope 1 Total	2,330.34
2	Purchased Electricity (Location-based)	2,776.61
	Purchased Electricity (Market-based)	1,534.44
2	Purchased Heat	3.60
2	Scope 2 Total (Location-based)	2,780.21
2	Scope 2 Total (Market-based)	1,538.04
3	Category 1: Purchased Goods and Services	81,972.29
3	Category 2: Capital Goods	8,423.21
3	Category 3: Fuel and Energy-Related Activities Not Included in Scope 1 or Scope 2	1,508.23
3	Category 4: Upstream Transportation and Distribution	30,926.55
3	Category 5: Waste Generated in Operations	207.88
3	Category 6: Business Travel	2,447.25
3	Category 7: Employee Commuting	2,497.12
3	Category 8: Upstream Leased Assets	295.54
3	Category 9: Downstream Transportation and Distribution	911.57
3	Category 10: Processing of Sold Products	0.00
3	Category 11: Use of Sold Products	518.83
3	Category 12: End-of-Life Treatment of Sold Products	103.11
3	Scope 3 Total	129,811.59
1 and 2	Scope 1 and 2 Total (Location-based)	5,110.55
	Scope 1 and 2 Total (Market-based)	3,868.38
3	Scope 3 Total	129,811.59
All	All Scopes Total (Location-based)	134,922.13
	All Scopes Total (Market-based)	133,679.96

*Market-based figures reflect the fact that AES buys 'green electricity' coming from renewable sources. Location-based figures do not take this into account and are therefore regarded by some experts as a more accurate picture of a company's carbon footprint.



For more information check out the GHG Inventory Report on aesseal.com.





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