ENVIRONMENTAL BEST PRACTICE

The Green Book: Volume 30

A valuable work of reference acclaimed around the world

Published by The Green Organisation
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THE GREEN ORGANISATION

Setting the standard...

The Green Book is the world's only annual international work of reference on environmental best practice.

It is published by The Green Organisation in tribute to the environmental endeavours and generosity of our Green World Ambassadors.

These are the companies, councils and communities who have won Green Apple Awards for their environmental efforts, and who have taken their commitment to the next level by helping others to help the environment.

They are assisting us in publishing their award-winning papers in The Green Book, and we distribute this valuable work of reference free of charge to environment professionals all over the world.

By helping others to follow their environmental lead and learn from their experiences and successes, they fully deserve the title of Green World Ambassadors.

Not only do they allow us to publish their case histories, but they welcome any followup inquiries. Each Green World Ambassador has a contact name and number shown in the Index, and any of them will do all they can to help others help the environment.

Editor's Note

In the interests of accuracy, these Green Apple Award-winning papers are published here in their original form – basically as provided by the entrants.

As many of the papers are of a technical or specialist nature, it was decided that the experience and expert knowledge of the contenders should not be compromised by the grammatical priorities and consistency of style that usually dominate the editing process.

Our priority is to communicate the aims, methods and achievements of our winners as they wish them to be presented. To this end, the contents have been only lightly edited and we ask for your tolerance of any grammatical shortcomings that might result.

The Green Organisation

www.thegreenorganisation.info

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ALLWOOD RECYCLING SOLUTIONS

Culina iForce Partnership

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At iForce Corby, Allwood combined on-site support with smart logistics to clear backlogs and build a resilient recycling system. The partnership recovered 24,200 pallets, processed 1,000 tonnes of waste, and lifted high-grade plastics by 53%. Savings include £51,880 from pallet/wood optimisation and £29,580 through training and procurement—plus donations that strengthened local charities and social impact.

DARREN ANDREW
dandrew@allwoodrecyclingsolutions.co.uk

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B

BIOGENIE REMEDIATION UK

Former Quakers Yard Gasworks Remediation and Environmental Improvement Works

Page 35

On a highly constrained, ecologically sensitive riverside, the team remediated historic gasworks contamination while keeping the area available as public open space. Careful engagement, multi-disciplinary planning, and reuse of site-won materials minimised transport and waste. The scheme exceeded Biodiversity Net Gain targets, stabilised the riverbank, and delivered planting and habitat enhancements that benefit people, wildlife, and place.

RHYS DAVIES
rhys.davies@biogenie.co.uk

BIRKETTS

Cambridge Office Refurbishment

Page 38

This fast-track transformation created a high-performing, comfortable office with improved light, acoustics, and efficiency—delivered while operations continued. ESG principles shaped every choice: furniture was repurposed or donated to schools and charities, digital equipment supported community needs, and materials were reused where possible. The result is a modern workplace that couples operational excellence with tangible social and environmental value.

EMMA ALLEN
emma-allen@birketts.co.uk

B

BOTAŞ INTERNATIONAL

Sea Turtle Monitoring and Conservation Project

Page 40

A long-running conservation programme has turned Sugözü into an officially protected nesting beach. Over 22 years the team recorded 2,360 green turtle nests and safeguarded about 61,500 hatchlings with protective caging and nest checks. Injured adults were rehabilitated and released. Extensive outreach with local people, industry and international volunteers has reduced human pressure and built lasting support for wildlife along this heavily used coast.

YÜCEL KANLI
yucel.kanli@bil.gov.tr

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C

CBRE - THE LONDON FRUIT & WOOL EXCHANGE

Local Origin Urban Farming - Fresh 360 Fruit and Veg

Page 44

With Local Origin, the site began a circular food-waste-to-food model: a large wormery and composting set-up to process occupier food waste into growing medium for on-site produce. The programme launched with an education demo and will expand to regular sessions, closing nutrient loops on site and building a replicable blueprint for urban resilience.

TRACEY SMITH
tracey.smith4@cbre.com

CUSHMAN AND WAKEFIELD

Butterbee’s - Nectar Café for Bee’s

Page 47

Responding to regional pollinator decline, the centre transformed unused balcony space into a nectar bar with upcycled pallets, bee houses and expert-selected plants. Staff and customers joined in, aided by downloadable “grow your own” guides and a friendly competition. The project proves urban retail can nurture biodiversity—and local pride—at low cost.

REBECCA BIRD
rebecca@buttermarketipswich.co.uk

E

ENERJISA ENERJI

SENTRUM: Sustainable Energy-Based Tourism Implementation Centre

Page 49

Enerjisa advanced sustainable tourism in Küçükköy and Birgi through energy-efficiency training and on-site upgrades for homes and businesses. Two hundred and twenty residents completed courses; installed measures now prevent about ninety thousand kilograms of carbon emissions each year. Küçükköy has become Türkiye's first certified green destination, with Birgi adopting the same model to pair lower energy use with stronger visitor appeal.

MERT ATAN
mert.atan@menailetisim.com

ENVIRONMENTAL CROP MANAGEMENT

A case study in Integrated Pest Management. Controlling Barley Yellow Dwarf Virus (BYDV) in Winter Cereals.

Page 52

ECM helps farmers curb BYDV using a holistic strategy that safeguards beneficial predators. Guided by university research, a carefully chosen pyrethroid minimises harm to spiders that control aphids, while integrated measures disrupt the pest across its life cycle. Results protect yields and keep food prices stable, delivering measurable returns for growers and environmental gains for farmland ecosystems.

PETER CLARE
peterclareecm@gmail.com

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H

HEIDELBERG MATERIALS

Quarry Life Award

Page 56

Since 2012, the QLA has funded practical, science-based biodiversity projects at extraction sites in 25+ countries, implementing 450+ initiatives and awarding €400k+ internationally. Outcomes include restored habitats, species conservation, and education integrated into long-term site management. Nearly 1,000 researchers and conservationists have participated, proving business can drive nature-positive impact at scale.

JOPS HILL
jops.hill@heidelbergmaterials.com

HEIDELBERG MATERIALS

Criggion Hydrogen Project

Page 59

A first for UK asphalt: a plant burner that can run on three fuels, including hydrogen, proving a practical route to lower-carbon roadbuilding. The team has completed multiple safety studies, engaged customers and councils, and shared learning widely so others can follow.

RACHEL MORSE
rachel.morse@heidelbergmaterials.com

K

KEY ENVIRO SOLUTIONS & 25 NORTH COLONNADE

25 North Colonnade London E14

Page 61

Recycling climbed from fifty-five to seventy-one percent, adding around thirty-nine tonnes of extra materials recovered in two years. The site now separates seven streams, runs annual awareness days and even mobilised fifteen tenants for a river clean-up.

PAUL OPENIBO
paul@keyenvirosolutions.co.uk

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L

LANDSEC

TOTM - Tackling Period Stigma and Plastic Waste with Sustainable Workplace Practices.

Page 64

Partnering with TOTM, the programme provides free, sustainable period care across workplaces—eliminating 53 kg of plastic and matching that with ocean plastic removal. Beyond access, it drives education, reduces stigma and supports Endometriosis UK. The initiative exemplifies inclusive ESG in action—linking wellbeing, equality and climate goals through measurable social and environmental impact.

ALISON CURRELL
alison.currell@landsec.com

M

MURPHY

Plant Team Sustainability at Murphy

Page 67

Murphy's initiatives demonstrate sustainable plant and energy practices across the UK. The Elstree Project features HVO fuel and a 100% electric excavator, TRU East showcases fully electric telehandlers to reduce diesel exposure, and the Responsible Plant Use campaign improves fuel efficiency, cuts emissions, and optimises operations, providing a model for low-carbon, cost-effective projects.

SINEAD O'CONNOR
sineadoconnor@murphygroup.co.uk

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N

NANOPOOL

Plastic Free Packaging

Page 70

Siopack-coated glassine swaps plastic packaging windows for recyclable transparency, cutting retail waste while keeping visibility and protection intact. The patent-pending technology from Nanopool GmbH enables scalable sustainable packaging across industries without process changes, advancing practical environmental solutions.

Sascha Schwindt
s.schwindt@nanopool.eu

NORDIK RETAIL

No Need To Flick Anything Anywhere Anymore

Page 72

Nanobin is a pocket-sized, sealed ashtray that makes responsible disposal easy at events and in cities. Manufactured in Europe from sustainable materials, it has sold more than one million units and is used by brands and municipalities. The design prevents litter, shifts behaviour, and reduces fire risk, offering a simple, scalable step toward cleaner streets and coastlines.

ALICE HERTZ DAHL
alice@nanobin.se

P

PARC TROSTRE RETAIL PARK

Encouraging an Improved Atmosphere Through Nature

Page 73

To complement habitats for bees and butterflies, fast-growing bamboo is being planted to capture carbon and improve local air quality. Bamboo matures in about three years, grows in many soils without pesticides, and can replace plastics and metals in everyday products, adding a practical climate benefit to the site's green network.

JANET CROSS
Janet.Cross@savillspm.co.uk

PURAGEN

Waste Reduction in the Biogas Industry

Page 76

Puragen developed a proprietary process to thermally reactivate high-sulfur activated carbons from biogas plants—materials previously destined for hazardous landfill. Operational since late 2023, the first-to-market solution turns "waste" media into feedstock for repeated reuse in purification, cutting disposal costs and advancing circularity in renewable gas.

DAVID REAY
david.reay@activated-carbon.com

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S

SAUDI ARAMCO

Pipeline Berm stabilization with Chemical Polymer T-30

Page 80

T-30 is transforming land management with safe, sustainable soil stabilisation. This advanced polymer creates a natural, durable crust that prevents erosion and sand drift while remaining non-toxic to plants, animals, and groundwater. Approved by environmental authorities and backed by Aramco, T-30 offers a cleaner, more efficient solution for desert soil protection and restoration.

ABDULLATIF A ALOMAIR
abdullatif.aalomair@aramco.com

SAUDI ARAMCO SAPD

Design and Simulation of Cathodic Protection (Cp) Systems

Page 82

A solar-powered cathodic protection system now guards pipelines against corrosion while replacing hydrocarbon electricity. Climate risk modelling guided design; remote monitoring proves reliability. The solution cuts operating costs and emissions, strengthens resilience, and supports the company's long-term pathway toward net-zero. Recognition at a leading 2025 energy award highlights its potential for wide adoption.

ABDULLATIF A ALOMAIR
abdullatif.aalomair@aramco.com

S

SEMAD

PSA - Pagamento por Serviços Ambientais (Payment for Environmental Services)

Page 84

The Cerrado em Pé programme rewards landowners and traditional communities for protecting native vegetation beyond legal minimums. In its first phase, 187 properties secured around 7,000 hectares with annual payments of 498 to 664 reais per hectare from the state environmental fund, thirty percent reserved for traditional groups. Satellite monitoring underpins transparency, while priority went to low-income municipalities to marry nature and equity.

TIAGO BELLOTO
tiagomigueldesouza@hotmail.com

SEOCHO-GU DISTRICT OFFICE

Repairs and Recycling on Wheels

Page 86

A mobile workshop tours the district to mend umbrellas, sharpen knives and revive houseplants, bringing circular economy services to residents' doorsteps. In its first year more than six thousand items were repaired or rescued, with strong satisfaction scores. The project also creates employment for people facing hardship, turning practical reuse into everyday social value.

JAE-YOUNG PARK
qjy0811@seocho.go.kr

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S

SEREMBAN CITY COUNCIL-MALAYSIA

Seremban Street Art

Page 88

A 550-metre mural and diorama trail transformed back lanes into a safe, walkable cultural route that encourages people to explore on foot, cools the street and boosts local trade. The reimagined thoroughfare has become a visitor attraction and helped rebrand nearby businesses. The Malaysian Tourism Council recognised the initiative with a national Gold Award for tourism promotion.

MOHD AZPURI ABD AZIZ
mohdazpuri@gmail.com

SODEXO

Achieving the Un Sdg 12.3 Ahead Of Deadline

Page 91

Sodexo set out to halve food waste by 2025 and beat the target early with its pharma client across Europe and Asia. Using the WasteWatch by Leanpath programme at 46 sites, teams prevented 472 tonnes of food waste, the equivalent of 868,000 meals, cutting about 3,300 tonnes of carbon and saving more than one point four million euros. Best practice now spreads across the portfolio.

ANA SVAB
ana.svab@sodexo.com

THE TROPICAL WATER RESEARCH ALLIANCE

Sustainable Development and Biodiversity Conservation of the Tocantins-Araguaia River Basin: Pilot Project

Page 93

Demonstration farms integrated ecological restoration with livestock, raising native vegetation cover, improving soils and reducing rural fires. New indices for tropical systems now help public managers track environmental quality and land use. Training, digital inclusion and local hiring strengthened incomes and skills. The programme generates policy-ready data while restoring Cerrado biodiversity and watershed health.

BETINA KOZLOWSKY SUZUKI
international@thetwra.org

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WORKMAN RETAIL & LEISURE

Feed The Worms And Bug Hotel

Page 96

Touchwood installed a large bug hotel and bee-friendly planting to boost pollinators, then closed the loop by composting team food waste in a Worm City system. The liquid feed and soil improver are used on site, cutting collection costs and enhancing gardens. Results include richer planting, increased pollen sources and visible staff-led stewardship shared with local schools and stakeholders.

LYNSEY RILEY
lynsey.riley@touchwoodsolihull.co.uk

2 PURE PRODUCTS

LOOPBOX PLASTIC CLOSED LOOP INITIATIVE

SUMMARY

Hygiene industry disruptor 2Pure Products is leading green cleaning and the measurable reduction of plastic waste with LoopBox, the UK's first plastic closed loop initiative to recycle both containers and packaging. Its OdorBac Tec4 multipurpose cleaner and other products are delivered in LoopBox, collected when empty, cleaned, refilled, and returned to the closed loop cycle.

The system prevents virgin plastic production, avoids additional collection journeys, offsets carbon on scheduled deliveries, and reduces CO_2 emissions. Customers can track their plastic and CO_2 savings through customised monthly reports. More than 21,000 plastic jerrycans have already been reused, preventing over six tonnes of CO_2, while cardboard packaging has largely been reused or recycled.

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2Pure Products' sustainability-focused design, use of 100% recycled plastic bottles, and highly effective all-in-one cleaning solutions further reduce environmental impact and single-use plastic.

IN DETAIL

Hygiene industry disruptor 2Pure Products is leading the way in green cleaning and the measurable reduction of plastic waste with LoopBox, the UK's first plastic closed loop initiative to recycle both containers and packaging.

2Pure Products' market-leading OdorBac Tec4 multipurpose cleaner and other products, such as OdorBac Toilet & Scale, are delivered to commercial customers in the innovative LoopBox. When the containers are empty, they are placed back into the LoopBox, collected by 2Pure's UK distributor, BCHS (Bunzl Cleaning & Hygiene Supplies), and returned to their local depot.

On the next delivery date, 2Pure collects and returns the LoopBox to its factory, where the containers are sorted, cleaned, and dried. They are then refilled, repacked in a LoopBox, and re-delivered to distributor depots, returning the containers to the closed loop cycle.

The LoopBox Plastic Closed Loop system prevents virgin plastic from being produced by reusing OdorBac's recycled plastic bottles repeatedly. No additional journeys are made for collection or delivery, and 2Pure Products also offsets the carbon on all scheduled delivery and collection journeys, significantly reducing CO_2 emissions. Customers are fully involved in the process and can see their plastic and CO_2 savings each month in a customised report.

Over 21,000 plastic jerrycans have already been reused, preventing more than six tonnes of CO_2 from being produced, and the majority of cardboard packaging has been reused or recycled. The uptake of recycling through LoopBox has doubled year on year.

"All of our products are developed, manufactured, and used with sustainability front of mind," says 2Pure Products Director James Law. "From day one we have been committed to reducing our impact on the environment, from only using ingredients that are safe for people and the planet to ensuring all bottles and containers are made from 100% recycled plastic.

"We are delighted to have been able to go one step further with the UK's first closed loop recycling system for the cleaning and FM market. The initiative not only minimises the amount of virgin plastic entering the loop, but it also reduces CO_2 emissions by limiting the number of journeys needed to make the recycling process achievable and sustainable for our customers."

2Pure Products are designed to be among the safest yet most powerful all-in-one cleaning solutions available, and their efficacy means customers need only use a single product, which also contributes to a reduction in single-use plastic.

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AD Ports

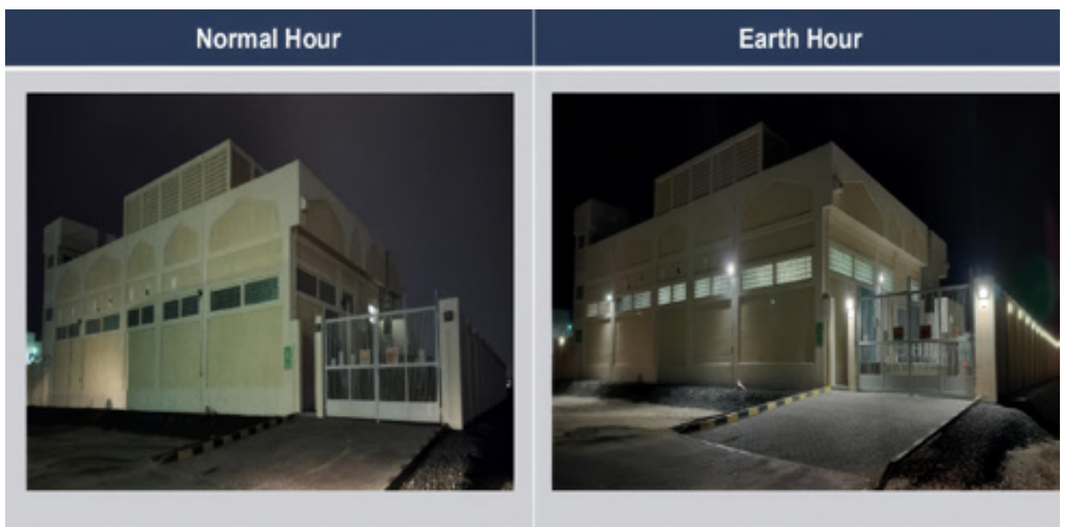
AD PORTS GROUP SOCIO - ENVIRONMENTAL INITIATIVES

SUMMARY

The socio-environmental initiatives delivered by AD Ports Group aimed to enhance environmental responsibility, community participation, and sustainable operational practices in line with ESG commitments. The campaign addressed responsible waste management through cooking oil recycling, environmental cleanliness via a large-scale clean-up, and energy conservation through Earth Hour participation. Practical initiatives encouraged behavioural change and stakeholder collaboration, supporting the UAE's sustainability objectives. Tangible outcomes included successful engagement of individuals, schools, and restaurants in recycling efforts with distribution of recycling containers, improved cleanliness and safety of a 10,000 sqm logistics site through volunteer-led action, and measurable energy savings during Earth Hour. These activities strengthened environmental awareness, stakeholder cooperation, and ESG performance, positioning the Group as a contributor to sustainability leadership. Previous initiatives have also gained recognition through awards including the Green World Award 2025 and Green World Ambassador 2025.

IN DETAIL

The socio-environmental initiatives undertaken by AD Ports Group were designed to embed sustainability within operational and community frameworks through practical interventions and stakeholder participation. The Cooking Oil Recycling Campaign addressed environmental risks associated with improper disposal of used cooking oil by encouraging households, schools, and restaurants to adopt responsible waste management practices. Recycling containers were distributed to facilitate participation and provide a structured mechanism for collection. This initiative aligned with circular economy principles by promoting the repurposing of waste materials and reducing environmental contamination, while simultaneously enhancing environmental awareness among participants.



Collaboration with Altawajid Albaladi Bani Yas strengthened community engagement and operational reach. The partnership enabled coordinated outreach efforts and the mobilisation of diverse stakeholder groups, ensuring broad participation and reinforcing shared responsibility for environmental outcomes. Behavioural change was targeted through educational messaging and practical solutions, supporting long-term adoption of sustainable disposal practices.

The KP5 Truck Plaza Clean-Up Campaign demonstrated collective environmental action within a heavily trafficked logistics zone. Approximately 50 volunteers contributed 100 hours of effort to restore cleanliness and improve safety across a 10,000 square metre site. Activities included waste removal and environmental restoration, enhancing operational conditions and reinforcing social responsibility. Positive volunteer feedback underscored the value of collaborative initiatives in fostering workplace pride and community cohesion. The campaign also highlighted the role of employee and stakeholder participation in achieving tangible environmental improvements.

Energy conservation efforts were advanced through the Earth Hour Campaign, which involved switching off non-essential lighting for one hour across Group facilities. This action delivered measurable electricity savings and increased awareness of energy consumption patterns. Participation in Earth Hour aligned operational practices with global sustainability objectives and reinforced the importance of individual and organisational contributions to environmental stewardship. The initiative demonstrated that small, coordinated actions can generate meaningful environmental benefits and support broader sustainability goals.

Recognition of previous socio-environmental initiatives through awards such as the Green World Award 2025 and Green World Ambassador 2025 validated the Group's commitment to sustainability leadership. These accolades acknowledged the effectiveness of inclusive and community-

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led environmental programmes in advancing environmental awareness and operational responsibility. They also reinforced the Group's position as a proactive contributor to national and global sustainability efforts.

Overall, the initiatives integrated environmental objectives with community engagement and operational practices. By addressing waste management, environmental cleanliness, and energy conservation, the programmes supported sustainable development and behavioural change. Stakeholder collaboration and practical solutions ensured accessibility and impact, embedding environmental consciousness within daily activities and operational frameworks. These efforts contributed to the reduction of ecological footprints and the promotion of collective responsibility for environmental protection within the UAE.

ADDLESHAW GODDARD

AGENDA NET ZERO – CARBON REDUCTION

SUMMARY

Addleshaw Goddard established AGenda: Net Zero to deliver science-based carbon reductions across operations and the value chain while embedding climate awareness into decision-making, client services, and firm culture. Targets validated in July 2025 by the Science Based Targets initiative align with a 1.5 °C pathway. Progress includes CarbonNeutral® certification for FY 2023/34 UK operations and business travel, transition to almost 100 % renewable electricity in UK offices, movement towards energy-efficient buildings, firmwide climate education delivered with AXA Climate, strengthened supply-chain screening, and enhanced governance through ISO 14001 systems and transparent reporting—demonstrating measurable environmental, organisational, and reputational benefit.

IN DETAIL

AGenda: Net Zero sets a structured pathway for reducing operational emissions (Scopes 1 and 2) and value-chain emissions (Scope 3) through defined targets, governance, and behavioural change. Absolute Scope 1 and 2 emissions are targeted to decrease by 42 % by FY2030 and 90 % by FY2045, while Scope 3 emissions per full-time equivalent are set to fall by 51.6 % by FY2030 and 97 % by FY2045, consistent with limiting global warming to 1.5 °C. Delivery actions include the transition to renewable electricity tariffs across UK offices, relocation decisions favouring lower-carbon and more energy-efficient premises, and verified carbon neutrality for UK operations and business travel in FY 2023/34.

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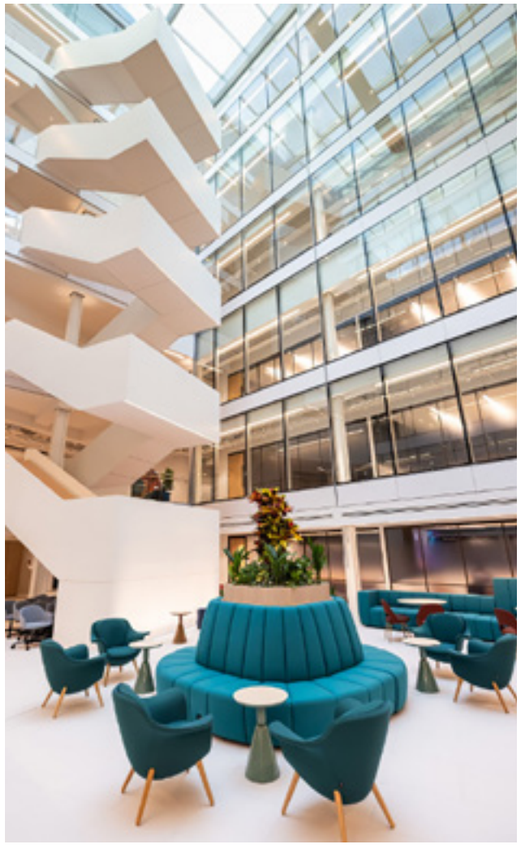
Value-chain progress is driven through procurement sustainability screening, emissions-data engagement with key suppliers, and reduced travel enabled by virtual meetings and hybrid working. Workforce capability is strengthened through structured climate education covering climate science, carbon impacts, and behavioural change, alongside firmwide environmental engagement activity. Environmental management is supported by audited ISO 14001 systems, improved emissions tracking and internal reporting, annual responsible business disclosure, and senior-level oversight embedded within organisational governance.

These actions deliver greenhouse-gas reductions across energy use, travel, and supply-chain activity; improved resource consumption and waste performance within office environments; integration of climate considerations into procurement, HR, governance, and client delivery; strengthened data quality; and visible climate action aligned with client and talent expectations. Ongoing priorities include expanding climate education to wider stakeholders, deepening sustainable supplier engagement to address Scope 3 hotspots, and developing collaborative environmental initiatives that sustain measurable long-term decarbonisation.



AETNA GROUP

SUSTAINABLE PALLET WRAPPING

SUMMARY

The Technoplat PW (Paper Wrapper) by Robopac is an eco-friendly, semi-automatic turntable machine designed to replace plastic stretch film with recyclable paper, reducing environmental impact. Its primary goals are sustainability through biodegradable paper, load protection and stability compliant with EU transport regulations, and operator safety via a multi-sensor mat and automatic clamping and cutting system. Capable of wrapping up to 30 pallets per hour, the PW combines environmental responsibility with industrial performance, precision, and compliance.

The Robopac Technoplat PW has earned recognition for sustainable packaging innovation: it was a first-to-market plastic-free solution, popular at IPACK IMA expos, and features advanced technologies like Cube Technology, Smart Glue dispensing, tilting carriage, adjustable tension, touchscreen controls, and R Connect remote monitoring. Overall, it balances eco-conscious design with high operational performance, safety, and regulatory compliance.

IN DETAIL

The Technoplat PW (Paper Wrapper) by Robopac is conceived as a cutting-edge, eco-friendly answer to conventional pallet-wrapping systems. Its core objective is to replace plastic stretch film with recyclable paper, reducing environmental impact throughout the packaging process.

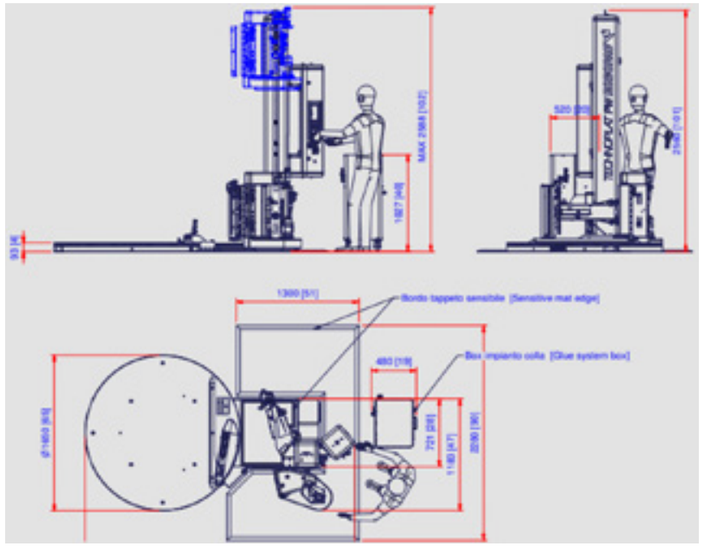
Designed as a semi-automatic turntable machine, the Technoplat PW focuses on three primary goals:

Sustainability: By utilising biodegradable paper instead of plastic, it addresses growing regulatory and social pressure to reduce single-use plastics and supports circular packaging strategies.

Load Protection & Stability: The system offers robust pallet stabilisation compliant with EU transport regulations. It tightly secures products to pallets, protects them from sun exposure and transit damage, and maintains load integrity.

Operator Safety & Efficiency: Equipped with a multi-sensor safety mat that halts the cycle if someone enters the danger zone, plus an automatic clamping and paper cutting system—featuring a tilting carriage to avoid creases—it enhances both safety and wrapping quality.

Altogether, the Technoplat PW marries environmental responsibility with industrial performance, achieving up to 30 pallets per hour



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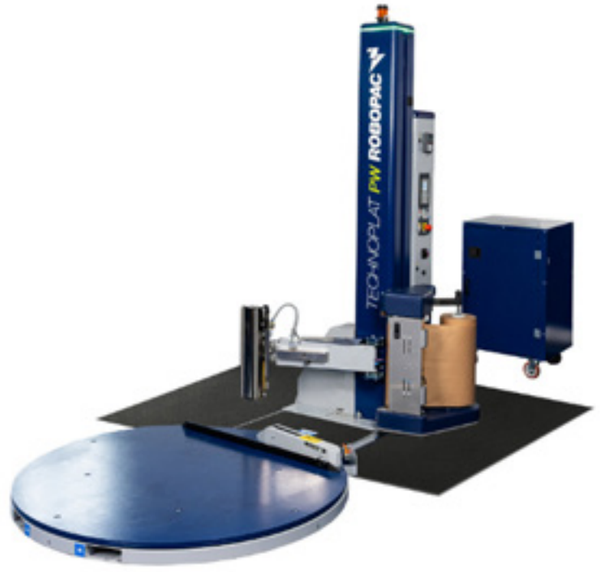
with precision, protection, and compliance—all while aligning with green supply-chain goals.

The Robopac Technoplat PW has achieved notable milestones in sustainable packaging innovation:

- First-to-market solution: The PW revolutionised pallet wrapping by replacing conventional plastic stretch film with recyclable paper, marking Robopac's bold entry into plastic-free packaging and drawing widespread attention.
- Fan favourite at expos: Lauded as a "crowd pleaser" at IPACK IMA, the PW captivated attendees with its eco-friendly design and intuitive automatic operation.
- High operational performance: Capable of wrapping up to 30 pallets per hour, it delivers industrial-grade productivity while maintaining environmental integrity.
- Regulatory compliance & load integrity: It boasts EU-compliant load stabilisation, protecting against sun exposure and transit damage.
- Advanced tech integration: Features such as Cube Technology for precise paper application, Smart Glue dispensing, auto clamping and cutting, tilting carriage to reduce creases, adjustable tension, and touchscreen controls demonstrate a high level of engineering sophistication.
- Enhanced safety & uptime: A multi-sensor safety mat ensures operator protection, and the R Connect remote monitoring system minimises downtime, supports troubleshooting, and facilitates firmware updates.



The Technoplat PW delivers a rare balance of eco-conscious design and industrial performance, earning acclaim at trade shows while providing real-world reliability, efficiency, and compliance.

ALLWOOD RECYCLING SOLUTIONS

CULINA IFORCE PARTNERSHIP

SUMMARY

At Allwood Recycling Solutions, strong partnerships and environmental best practices underpin every project. Their collaboration with Culina Group at the iForce House site aimed to improve waste management, deliver sustainability benefits, and identify CSR opportunities. Through a combination of immediate operational improvements, staff training, and long-term strategies, Allwood has already achieved significant environmental and financial impact. Key results include recovering 24,200 pallets, processing over 1,000 tonnes of waste, increasing the use of high-grade environmentally friendly plastics, and saving iForce £81,460 in costs. The project has also delivered measurable sustainability savings in fuel, energy, and CO2 emissions, while supporting community initiatives through charitable donations.

IN DETAIL

Allwood Recycling Solutions believes that environmental best practices are most effective when built on strong collaborations throughout the supply chain. The partnership with Culina Group was founded on credibility, confidence, and trust, aiming not only to enhance internal waste management at their iForce House site but also to create benefits for the wider community. While Culina Group recognised the importance of sustainability, they required expert guidance to make a tangible impact on key ESG areas. Allwood's goal was to optimise iForce's facilities, services, and knowledge to maximise environmental benefits, identify CSR opportunities, and reduce costs.

The approach combined immediate operational changes and ongoing staff support with long-term strategies and education to foster a positive

sustainability culture. Given that Culina Group is one of the UK's largest logistics companies with over 100 sites nationwide, there is significant potential for these initiatives to be expanded on a national scale.

Neil Henderson, General Manager at iForce Corby, stated: *"Allwood saved us. They took over as our waste management partner in January and quickly got on top of the post-Christmas waste, getting the site back to its world-class standard."*

The project is ongoing, with Allwood's Contract Manager, Engineer, and operatives providing extensive on-site support. Achievements so far include:

- Recovery of 24,200 pallets
- Processing 1,000.2 tonnes of waste
- Increasing Poly 98/2 (high-grade, environmentally friendly plastic) by 53%
- Installation of new equipment
- Introduction of WasteSmart Training
- Successful Environmental Agency inspection

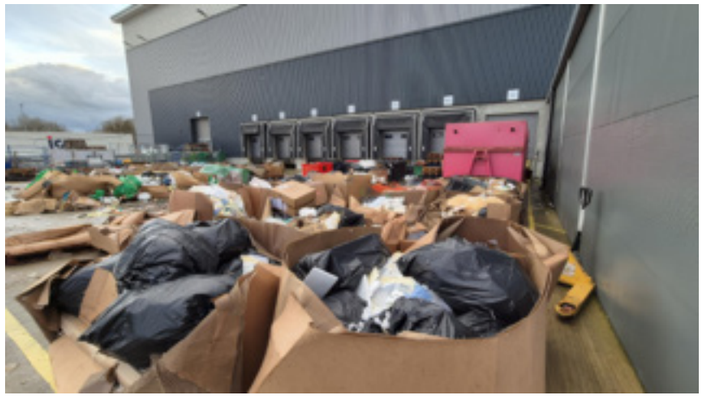
Sustainability savings recorded in Q1 include:

- 143 transport trips avoided
- 272 miles and 108.5 gallons of fuel saved
- 4,373.25 KWH energy and 285.45 KG CO2E reduction

Through wood waste and pallet management processes, iForce has saved £51,880—a reduction of 84% compared to their previous supplier. An additional £29,580 has been saved through training, procurement activities, and decommissioning old equipment. Notable initiatives include:

The project has also reinforced iForce's Corporate Social Responsibility through charitable contributions:

- Salvation Army: 14 pallets of charcoal and barbeque sets for resale
- Surplus2Purpose: 13 pallets of garden essentials for community use



Further CSR opportunities are being explored, highlighting the commitment to ongoing community engagement.

Neil Henderson commented: *"We're incredibly grateful to Allwood for their unwavering support in transforming our waste management into a streamlined success."*

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BIOGENIE REMEDIATION UK

FORMER QUAKERS YARD GASWORKS REMEDIATION AND ENVIRONMENTAL IMPROVEMENT WORKS

SUMMARY

The former Quakers Yard Gasworks, owned by Wales & West Utilities, required remediation due to historic use, remaining in-ground infrastructure, and an eroding riverbank exposing contaminated ground.

The project aimed to mitigate statutory risks, make the site suitable for continued public open space, and provide a durable solution considering foreseeable climate change. The site was highly constrained, with limited space, no vehicle access, and an ecologically sensitive setting.

Remediation was completed on time and within budget, enabling ongoing public use and delivering sustainable ecological benefits. Engagement, consultation, pre-planning, and a multi-disciplinary approach helped overcome challenges, with several site-won materials re-used.

Excavation, segregation, stabilisation, and wider materials management removed significant contamination. Treated materials meet site-specific protective criteria, and re-used non-treated materials pose low risk.

Biodiversity Net Gain was exceeded through planting ~1,700 trees and shrubs, wildflower and grass seeding, habitat restoration, and a sustainable riverbank solution.

IN DETAIL

The former Quakers Yard Gasworks, owned by Wales & West Utilities, required remediation due to its historic use, remaining in-ground infrastructure, and an eroding riverbank exposing contaminated made ground. Gas production on the site dated back to 1898, with historical structures including two below-ground gasholders (one later converted to a tar well), an above-ground gasholder, retort house, Tully plant, purifiers, scrubbers, washers, exhauster house, governor, meter house, and the site manager's house. Previous investigations identified coal tar contamination, Non-Aqueous Phase Liquids (NAPL), and asbestos in shallow demolition rubble. Tar was observed seeping through the riverbank, posing a risk of collapse and environmental harm.

The project aimed to mitigate statutory and environmental risks, make the site suitable for continued public open space, and provide a durable solution

considering foreseeable climate change. Delivery was complicated by a highly constrained site with limited space, no vehicle access, steep paths, a narrow pedestrian bridge, and significant ecological sensitivities, including protected species and habitats, with surrounding woodland subject to Tree Preservation Orders.

Extensive ecological surveys were completed, including a Contemporary Preliminary Ecological Appraisal, species-specific assessments, and an Ecological Management Plan. A Biodiversity Net Gain (BNG) Feasibility and Design report guided habitat reinstatement. The preferred remediation approach was site-wide excavation and turnover, coupled with onsite soil stabilisation and solidification. A Materials Management Plan (MMP) ensured material reuse, treatment, or appropriate off-site disposal, including asbestos and cast-iron pipework.

Works were divided into three areas: Area A (Gasholders No.1 and No.2), Area B (gasworks process areas including the retort and exhauster houses), and Area C (shallow asbestos-impacted ground and demolition rubble). Preparatory works included site clearance, vegetation management outside nesting seasons, and river protection measures, including silt barriers and coir mats in line with the Flood Risk Assessment Permit (FRAP).

Main remediation works (July–December 2024) involved excavation over 3.5 m to natural ground, removal of former structures, and processing of concrete and brick for onsite reuse. Approximately 4,000 m³ of material were processed, with 413 m³ treated onsite, and less than 1% disposed of offsite. Shallow asbestos hotspots were segregated and removed for licensed disposal. Drainage works were installed to prevent spring water from flowing through contaminated made ground, channelling it via lined French drains to the river.

A sustainable eco-engineered riverbank solution was implemented, reprofiling the bank, removing contamination, and using site-won wood to provide refugia for fish. Aqua rock bags, rock mattresses, and imported aggregate supplemented site-won materials, while native topsoil, wildflower/grass seeding, and 200 willow cuttings were planted along the bank.

Habitat restoration exceeded expectations, with approximately 1,700 trees and shrubs planted (860 onsite, 670 offsite, 200 willows), alongside two hibernacula, an otter holt, bee hotels, a bee basking

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bank, and bird and bat boxes including kingfisher-specific boxes. Reduced vehicle traffic and reuse of site-won materials further enhanced ecological outcomes.

Verification and monitoring included sampling of soil, treated material, groundwater, and surface water. Excavation samples were collected on a 10 m × 10 m grid (69 samples total). Treated material was tested to EA NEN 7375 standards, confirming durable, monolithic material with very low leaching rates. Groundwater and surface water monitoring continues post-completion.

The project was completed on time and within budget, successfully mitigating historic contamination risks while maintaining public open space. Social value initiatives included donations to Taff Bargoed Foodbank, a litter-picking event with Keep Wales Tidy, and the installation of benches and information boards highlighting the site's industrial history and ecology.

BIRKETTS

CAMBRIDGE OFFICE REFURBISHMENT

SUMMARY

This project delivered a modern, high-performing workplace for a top 50 law firm, carefully balancing ambition, operational excellence, and sustainability. Environmental, Social, and Governance (ESG) values guided every decision, ensuring design choices created meaningful impact. Redundant furniture was repurposed or donated, essential equipment supported local schools and charities, and waste was minimised. The result is a workplace that combines efficiency, wellbeing, and environmental responsibility, reflecting a thoughtful, socially conscious approach to modern office design.

IN DETAIL

The project set out to create a workspace that reflects the ambition, growth, and standards of a top 50 law firm, while remaining sympathetic to budget and committed to sustainability. A high-performing environment was delivered, enhancing heating, lighting, and acoustic performance to support employee wellbeing and productivity. The programme of works was fast-paced yet carefully managed to minimise disruption, allowing colleagues to continue working throughout, and completed efficiently, demonstrating a focus on operational excellence.

From the outset, ESG principles shaped every decision. Sustainability was approached as more than design—it was about tangible, lasting impact. Redundant furniture was repurposed or redistributed to local organisations, diverting it from landfill. The Bellbird Primary School received a full set of crockery, replacing their mismatched collection and bringing dignity to everyday use. Steel Bones, a charity supporting amputee families, received boardroom furniture and office essentials, supporting their growing team. Additionally, 100 mice, 100 keyboards, 20 monitors, and stationery were donated to some of Cambridge's most deprived schools, while families impacted by incarceration were supported through Rebooted with vital digital tools.

Internally, furniture and fittings were reused and blended with the new design, reducing waste and preserving the value of existing resources. This transformation reflects a balanced approach: delivering a modern, aspirational workspace while embedding environmental responsibility, social value, and lasting benefits for both people and the planet. Thoughtful planning, operational efficiency, and a commitment to ESG principles ensure this project demonstrates how design can create positive change for employees, communities, and the environment.

BOTAŞ INTERNATIONAL

SEA TURTLE MONITORING AND CONSERVATION PROJECT

SUMMARY

The Gulf of İskenderun, where our company operates, is an area of significant industrial and maritime activity but also serves as a critical breeding and nesting ground for sea turtles. Our sea turtle conservation project began under the framework of the Environmental Impact Assessment (EIA) for the Baku-Tbilisi-Ceyhan (BTC) Crude Oil Pipeline Project and has since expanded to include active conservation measures. These efforts encompass the collection of bioecological data, protection of nests and hatchlings, rehabilitation of injured turtles, and awareness-raising initiatives aimed at reducing human-induced pressures.

Since 2002, monitoring and conservation activities at Sugözü Beaches have led to the official designation of the area as a nesting site and the protection of over 70,000 hatchlings through nest caging and rescue operations. Field studies have also contributed to scientific research, including temperature-dependent sex determination, the identification of the Mediterranean green turtle subpopulation, and numerous academic theses and publications. Recent data show an upward trend in nesting over the last five years, demonstrating the effectiveness of the conservation efforts. Through long-term engagement with local communities and stakeholders, the project has combined industry operations with environmental stewardship, setting an example of sustainable development.

IN DETAIL

The Gulf of İskenderun, home to our company, is characterised by heavy industrial and maritime traffic, yet it remains a vital habitat for sea turtles, serving as breeding and nesting grounds. The sea turtle project was initiated as part of the Environmental Impact Assessment (EIA) Report for the Baku-Tbilisi-Ceyhan (BTC) Crude Oil Pipeline Project, initially focused on monitoring and providing data related to sea turtles. Over time, the project's scope expanded to include active conservation measures. These activities comprise providing bioecological data on sea turtles, implementing protective measures for nests and hatchlings in terrestrial environments, transporting injured turtles to rehabilitation centres, and raising awareness about wildlife conservation among both the industrial sector and the public. The overarching goal is to recover the sea turtle population by increasing natality through terrestrial conservation and reducing adult mortality through rehabilitation, while ensuring the sustainability of conservation efforts through education and awareness.

Based on monitoring results, Sugözü Beaches, the study area, were officially designated as nesting beaches by the relevant ministry in 2009. Over a 22-year period, a total of 2,360 green turtle nests and 2,985 non-nesting emergences were recorded, amounting to 5,345 activities in the terrestrial environment. Caging measures implemented

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at these sites protected 61,500 hatchlings from predation. Hatchlings unable to emerge naturally were also rescued during nest inspections, further contributing to the population. Injured turtles found stranded on the shore were treated and successfully released back into the sea. In addition, awareness-raising activities were conducted, engaging local and international volunteers and reaching a broad audience.

Sea turtles, recognised as iconic and umbrella species in conservation biology, also protect their broader habitats. Our company's project, therefore, integrates environmental responsibility into industrial operations. A team of experts conducts daily fieldwork during the nesting season, identifying nests and non-nesting emergences, caging nests, relocating them closer to the sea, rescuing trapped hatchlings, referring injured adults to rehabilitation centres, and educating the local community. Since 2002, approximately USD 660,000 has been allocated to sea turtle monitoring and conservation, with ongoing contributions from experts and volunteers.

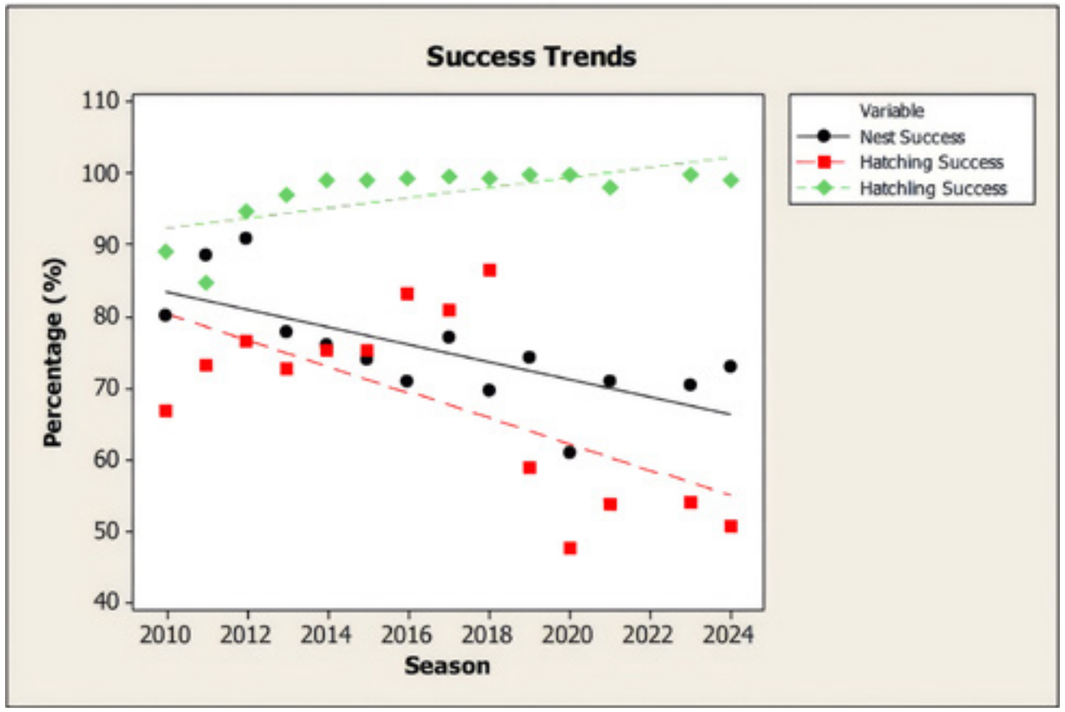
Initially, the project focused on monitoring sea turtle activity through our EIA report, identifying four beaches with high green turtle activity between 2002 and 2005, collectively named Sugözü Beaches. Bioecological data collected from 2006 to 2008 led to their official designation as nesting beaches by the Nature Conservation and National Parks Directorate. This recognition introduced significant restrictions on human activity and development in surrounding areas, ensuring safer conditions for sea turtles and fostering environmentally sensitive development both on land and in the marine environment. Our project represents a pioneering example of balancing industrial use with environmental protection. All surrounding facilities are now required to comply with regulations for sea turtle conservation.

Conservation measures implemented at Sugözü Beaches include nest relocation, predation pressure assessment, artificial light screening, and nest protection. The project also investigates the effects of climate change, as sea turtle sex determination is temperature-dependent. Research has shown that incubation periods can predict hatchling sex, metabolic heating affects nest temperatures, and the Mediterranean subpopulation of green turtles has been identified for the first time. Within the project's scope, 17 undergraduate theses, five master's theses, and one doctoral thesis have been completed, with four master's and two doctoral theses ongoing. Fourteen articles from the scientific studies have been published in high-impact journals.

Predation, the most fundamental natural pressure on nests, was closely monitored. Over the project period, caging measures enabled 61,500 hatchlings to survive predation, and an estimated 60,000 hatchlings reached the sea. A total of 7,695 trapped hatchlings were rescued, bringing the total number of hatchlings added to the population to approximately 70,000. Injured turtles were treated and released, contributing to adult survival. The estimated annual number of green turtle nests in the Mediterranean is 300–400, with the 2020 assessment recording 2,800 nests for Chelonia mydas, predominantly on Turkey's Mediterranean coasts.

Recent five-year field data indicate varying nesting trends at Sugözü Beaches: while Beach 1 and Beach 2 show a downward trend, other beaches demonstrate an upward trend. Although Sugözü Beaches had the lowest green turtle nest numbers five years ago, they became the fourth most active nesting site in 2021. Given that sea turtles reach sexual maturity at approximately 15–25 years, the increase in natality over the last five years highlights the effectiveness of conservation measures, particularly nest protection.

The project has also engaged a wide range of stakeholders, from primary school students to fishermen, raising awareness over more than 20 years. Children introduced to sea turtles in the early years of the project are now adults in decision-making positions, extending the project's influence. By combining robust field data with practical conservation measures, the project has contributed significantly to global biological heritage. The gradual increase in nesting and hatchling numbers demonstrates the success of these conservation efforts, and continued collaboration between scientific organisations and industrial companies is recommended to further enhance outcomes on a broader scale.



CBRE-THE LONDON FRUIT & WOOL EXCHANGE

LOCAL ORIGIN URBAN FARMING - FRESH 360 FRUIT AND VEG

SUMMARY

Local Origin is proposing a collaboration with the London Fruit & Wool Exchange (LFWE) to implement a circular urban farming and food waste management model. The project focuses on three integrated services: food waste management, urban farming, and educational outreach, forming a sustainable, hyper-local system that reduces emissions, improves soil health, and engages the community.

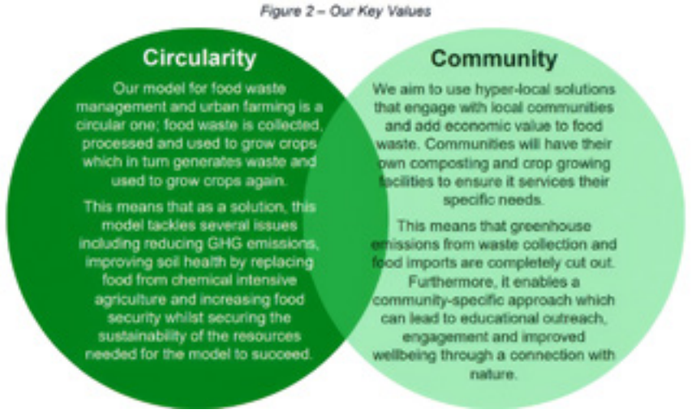
Food, cardboard, and garden waste from LFWE businesses will be collected and processed through bokashi pre-composting, aerobic composting, and vermicomposting, producing vermi-compost and vermi-compost tea. These outputs are then used in urban farming operations, including hydroponic towers, microgreen trays, mushroom cultivation, and biodiverse raised beds, providing crops to on-site businesses and the wider community.

Figure 1 – Circularity as integral part of Local Origin business

The project has demonstrated impact at the Spitalfields Estate, processing approximately 1,360 litres of compost (equivalent to 1,700 litres / 480 kg of food waste, 1,400 litres / 159 kg of cardboard, and 350 litres / 39 kg of garden waste) and producing 99% fewer greenhouse gas emissions than landfill.

The LFWE trial period will last at least one year, during which food waste management and produce will be provided free of charge, with capital contributions repaid through the value of produce. The project is designed to scale and be customised to site-specific needs, with long-term goals to expand across London, integrate community learning, and maximise local food security.

Figure 2 – Our Key Values



IN DETAIL

Local Origin, founded in 2022, proposes a collaboration with the London Fruit & Wool Exchange

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(LFWE) to implement a circular urban farming and food waste management model. The project is designed to deliver a 360° fruit and vegetable concept that strengthens urban food security through a sustainable, hyper-local approach. The services comprise food waste management, urban farming, and educational outreach, forming a circular system that minimises waste, reduces greenhouse gas emissions, and engages the local community.

The food waste management service collects food, cardboard, and garden waste from LFWE businesses. During the trial period, collection will be on foot, with future plans to include electric cargo bikes or electric vehicles. Waste is first processed using bokashi bran pre-composting, fermenting food waste including meat and dairy. The material then passes through aerobic composting, heated to 60–70°C to accelerate decomposition and eliminate pathogens, weeds, and seeds. Finally, the material is converted into vermi-compost in vertical bioreactor towers based on the Johnson-Su Bioreactor model. Vermi-compost tea, a nutrient-rich liquid fertiliser, is also produced for use in hydroponics or sold commercially.

The urban farming unit uses controlled-environment crop production methods utilising compost from the waste management process. Hydroponic towers, approximately 1 metre wide and 2 metres high, allow up to 30 plants per tower and use vermi-compost tea as a nutrient solution. Microgreens are grown on trays in vermi-compost and harvested after around 20 days, with multiple species possible depending on demand. Mushrooms are cultivated using vermi-compost as a pasteurised substrate, starting with oyster mushrooms and expanding to gourmet varieties in the future. Biodiverse raised beds support pollinators, increase native plant diversity, provide an educational platform, and enhance ecosystem balance. Water collection and storage systems reduce reliance on utilities and support vermi-compost curing, reinforcing circularity.

Educational and community outreach is central to the project, including free and paid workshops, demonstrations, and training for schools, universities, and community groups. These activities aim to improve recycling, teach sustainable farming, provide volunteering and employment opportunities, and create a community learning hub.

The project has already demonstrated measurable impact at Spitalfields Estate, producing approximately 1,360 litres of compost (equivalent to 1,700 litres / 480 kg of food waste, 1,400 litres / 159 kg of cardboard, and 350 litres / 39 kg of garden waste), achieving 99% fewer greenhouse gas emissions compared with landfill and less than half the emissions of waste-to-energy processing. This approach improves soil health, reduces reliance on imported food, and supplies high-quality compost for urban farming.

The LFWE project will begin with a trial period of at least one year, allowing Local Origin to scale and customise operations for the site. During this period, food waste management and produce will be provided free, with the value of produce used to repay capital contributions. Post-trial, Local Origin retains 100% of revenue from compost, produce, and services. The total capital required is £7,540, with LFWE occupants contributing 75% (£5,655) and Local Origin contributing 25% (£1,885). The estimated payback period is 2.3 years.

The long-term vision is to expand Local Origin's circular model to additional London sites, scaling food waste management and urban farming operations, integrating knowledge and resources across communities, and continuing educational programmes. This project offers a replicable, sustainable solution to food waste, emissions, and local food security challenges while engaging the community in hyper-local food production.

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CUSHMAN AND WAKEFIELD

BUTTERBEE'S - NECTAR CAFÉ FOR BEE'S

SUMMARY

Following a study by WWF and Buglife into the state of bees in the east of England, which found that 17 species have already gone regionally extinct, an unused balcony space was activated in support of Earth Day to install a Bee Nectar Bar.

As the centre is located in an urban town where green roof spaces can support diverse pollinator populations, creating a bee-friendly area provides a safe and welcoming habitat for bees and other beneficial insects.

A localised approach was developed to support biodiversity and protect local bees by turning the unused balcony into a nectar bar, encouraging staff and customers to get involved, and promoting the benefits and protection of bees.

The Buttermarket Centre aimed to attract bees to the Nectar Café to maximise economic benefit to the local area and to maintain and enhance an urban garden area, successfully achieving all key aims through planting bee-friendly species, enhancing the space with upcycled materials, and encouraging community participation.

IN DETAIL

Following a study carried out by WWF and Buglife into the state of bees in the east of England, it was identified that 17 species have already gone regionally extinct. In response to this finding, and in support of Earth Day, a decision was made to activate an unused balcony space and install a Bee

Nectar Bar to provide practical local support for pollinators.

As the centre is situated within a town with a more urban population, evidence shows that urban landscapes can successfully support diverse pollinator populations, particularly where green roof spaces and planted areas include pollinator-friendly species. Creating a bee-friendly environment therefore offers a safe, accessible, and welcoming habitat for bees and other beneficial insects in and around the immediate area, while also raising awareness among visitors and staff.

To support and promote biodiversity and protect local bees, a localised approach was devised that focused on:

- Turning an unused balcony space into a nectar bar
- Encouraging staff and customers to actively participate
- Promoting the benefits of bees and the importance of their protection

The Buttermarket Centre established two primary aims for the space:

- To attract bees to the Nectar Café, helping to maximise positive environmental and economic benefit to the local area
- To maintain and enhance an urban garden area that supports pollinators year-round

All three key aims of the project were successfully achieved:

- Attracting bees to the Nectar Café – A carefully selected range of bee-friendly plants was introduced to attract and nourish bees across different seasons. Guidance was sought from the Suffolk Bee Society to ensure an appropriate balance of pollinator plants and habitats was maintained.
- Maintaining and enhancing an urban garden area – Existing pallets left on site were upcycled into planting beds and bee houses, improving sustainability while enhancing the visual and ecological value of the nectar bar.
- Encouraging team and community involvement – A bespoke nectar bar information print-out was produced for site teams and made downloadable via the website and social media channels. In addition, a staff competition for the best bee-friendly area was introduced to inspire team members to create supportive habitats within their own gardens and green spaces, further extending the project's local impact.

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ENERJISA ENERJI

SENTRUM: SUSTAINABLE ENERGY-BASED TOURISM IMPLEMENTATION CENTRE

SUMMARY

SENTRUM is a Sustainable Energy-Based Tourism Application Centre aiming to transform underdeveloped destinations, promote sustainable tourism, and support local economic development. The project began in Ayvalık, Küçükköy, to create a replicable and scalable sustainable green destination, integrating energy efficiency, renewable energy, and community-based socio-economic development. SENTRUM addresses environmental, social, and economic impacts while preserving cultural and natural heritage, including Anatolian kilim motifs and traditional architecture. Initiatives included energy audits, solar power installations, energy-efficient lighting and appliances, permaculture gardens, workshops, and training for local women, students, and businesses. Key outcomes include Necmi Komili School becoming one of Turkey's first Net Zero Energy Buildings, the establishment of sustainable tourism routes, and installation of electric vehicle charging stations. The project aligns with multiple Sustainable Development Goals, particularly affordable and clean energy, decent work and economic growth, responsible production and consumption, and gender equality. SENTRUM now continues in Birgi, Ödemiş, focusing on sustainable governance, socio-economic development, and local cultural preservation.

IN DETAIL

SENTRUM's first phase in Ayvalık, Küçükköy, was established as a Sustainable Energy-Based Tourism Application Centre with the aim of transforming a destination that had not reached its full potential. The project integrated energy efficiency, renewable energy, and community-based socio-economic initiatives while respecting local cultural and natural

values, including traditional stone architecture, agricultural practices, and Anatolian kilim motifs. A detailed current situation analysis identified tourism resource values, marketable cultural and natural assets, and stakeholders. Green destination standards from various countries were studied and adapted to Küçükköy's context, forming roadmaps for green procurement, sustainable transportation, production, and consumption.

Energy audits were conducted for eight tourism businesses and two public buildings, resulting in energy-efficient lighting, white goods, and solar power installations. A private business also received support for energy improvements. A total of 140 participants, including high school students, local women, and business owners, received training on energy efficiency, renewable energy, sustainable tourism, waste management, climate change, and gender equality. A 'SENTRUM Coordination Office' was established at Sabancı University's Creative Technologies Workshop, accessible to local residents, businesses, and tourists, to provide guidance and raise awareness.

To demonstrate sustainable agriculture, a permaculture garden was created in the workshop's garden. The garden supported education and practical applications, including compost production, rainwater harvesting, permaculture techniques, and sustainable resource use.

Significant achievements include Necmi Komili Primary and Secondary School becoming one of Turkey's first Net Zero Energy Buildings and the installation of electric vehicle charging stations in a public parking area, saving 15,000 kg of coal and preventing 90,000 kg of carbon emissions annually. Sustainable tourism routes, including walking and cycling paths, were created, with panels, maps, and five informational signs installed, while worn signs were digitised with multilingual content.

The second phase in Birgi, Ödemiş, expands these initiatives. Local tourism businesses and public buildings underwent energy audits, and sustainable tourism training was provided to 350 participants covering behavioural finance, content production, customer-focused sales, fire safety, energy efficiency, and creative drama. Workshops encouraged production and creativity; in the Eco Print workshop, fabrics were coloured inspired by nature, and workshops on vinegar and pickle production were conducted in collaboration with Şerife Aksoy for local women and tourism businesses. Video recordings were made for

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those unable to attend, and content for the 'Birgi Sustainable Flavours' booklet began simultaneously.

A building allocated by Ödemiş Municipality was redesigned for sustainable tourism activities, furnished primarily for women and children. Birgi-specific sustainable tourism routes were created, five signage boards were installed, and worn signs were digitised with multilingual, updated designs. Marketing and branding strategies were developed, and the Gender Equality Action Plan was applied to all activities. Eleven local pension operators received training on GSTC Certification processes and sustainable tourism practices. Focus groups and action plans addressed gender equality, climate risk, employability of women and youth, and internship opportunities for vocational and university students.

Through all activities, SENTRUM addresses multiple Sustainable Development Goals, including SDG 7 (affordable and clean energy), SDG 8 (decent work and economic growth), SDG 12 (responsible production and consumption), SDG 5 (gender equality), and SDG 13 (climate action), contributing directly and indirectly through practical applications, education, and capacity-building initiatives. The project integrates energy efficiency, renewable energy, cultural preservation, and community-based socio-economic development into a replicable model for small-scale destinations in Turkey.

ENVIRONMENTAL CROP MANAGEMENT

A CASE STUDY IN INTEGRATED PEST MANAGEMENT. CONTROLLING BARLEY YELLOW DWARF VIRUS (BYDV) IN WINTER CEREALS.

SUMMARY

The project aimed to help farmers control BYDV infection in UK winter cereals using an integrated and holistic approach rather than relying solely on conventional insecticides. ECM uses Sven, a synthetic pyrethroid, which a PhD study at Manchester Metropolitan University showed to be minimally harmful to beneficial insects such as spiders that prey on aphids. The study found that spiders were only disrupted for a day or so after application, unlike other insecticides that killed them.
This approach has been applied for many years, aligning with ECM's philosophy of "profitable crops, safely." By combining selective chemical use with innovative cultural practices, ECM has successfully prevented yield losses of up to 50%, equivalent to £950 per hectare on a 10-ton Winter Wheat crop, for a minimal outlay of £5.66 per hectare. Farmers benefit from higher yields and lower herbicide costs, consumers enjoy stable wheat prices, and the environment thrives as beneficial insects survive and multiply, providing ongoing pest control.

IN DETAIL

BYDV is a yield-robbing virus affecting UK winter cereals, including wheat, barley, oats, and triticale, and is the most economically important virus in UK cereals. In severe infections, particularly in Northwest England, losses of up to 60% in winter wheat and 50% in winter barley are not uncommon. The virus is transmitted by cereal aphids that feed on crops soon after emergence. Once a plant is infected, there are no remedial controls, and symptoms appear only the following April or May, leaving farmers unaware of the extent of the damage until it is too late to plant alternative crops. Infected plants appear red or yellow, remain dwarfed, fail to develop properly, and yield poorly.

ECM studied the cereal aphid's life cycle and developed a comprehensive approach to control the virus at multiple stages. Aphids live in grassland, and desiccating the grassland before planting reduces virus pressure on winter cereals. Herbicide-resistant ryegrass also acts as a source of BYDV when aphids feed on it. ECM developed novel methods to control this ryegrass, reducing herbicide use and preventing competition with the crop, while denying aphids access to the virus. Farmers had previously delayed drilling to avoid early aphid landings in September, which often led to lower yields and forced some to grow lower-yielding spring barley. ECM's approach allows timely drilling without compromising crop performance and ensures the best possible establishment for winter cereals.

A key element of the project was breaking the 'green bridge,' where volunteer cereals from the previous crop could carry infected aphids directly into new crops. By disrupting this pathway, ECM reduces the initial virus load at planting. The use of Sven, the selective pyrethroid, ensures that beneficial insects such as spiders survive and continue to prey on aphids long after the chemical effect fades. Aphids themselves provide a safe food source for spiders, allowing their populations to multiply and maintain natural pest control within the crop. This ecological approach prevents further BYDV infection events and leaves the environment largely undisturbed.

The economic benefits are substantial. Yield losses of up to 50% have been avoided, translating to £950 per hectare for a 10-ton Winter Wheat crop, at a cost of just £5.66 per hectare for the pyrethroid. Farmers benefit from higher yields, reduced herbicide use, and greater certainty in crop outcomes. Consumers benefit from stable wheat prices, as protected yields maintain supply and prevent price spikes caused by virus-induced shortages. ECM staff, alongside 90 Crest agronomists across the UK, have been trained in these methods and have shared knowledge widely through Crop Production magazine.

The project demonstrates ECM's innovation by combining PhD-level research on the least damaging crop protection options with cultural practices that

disrupt virus transmission at its source. Further work continues on controlling herbicide-resistant ryegrass and exploring benign bio-insecticides soon to be available in the UK. ECM's strategy aligns with its mission to produce profitable, top-quality crops while feeding people, maintaining high yields, protecting the environment, and ensuring sustainable, affordable food production. By integrating chemical, cultural, and ecological approaches, ECM has created a model for long-term BYDV control that is both effective and environmentally responsible, showing measurable benefits for farmers, consumers, and the wider ecosystem.

HEIDELBERG MATERIALS

QUARRY LIFE AWARD

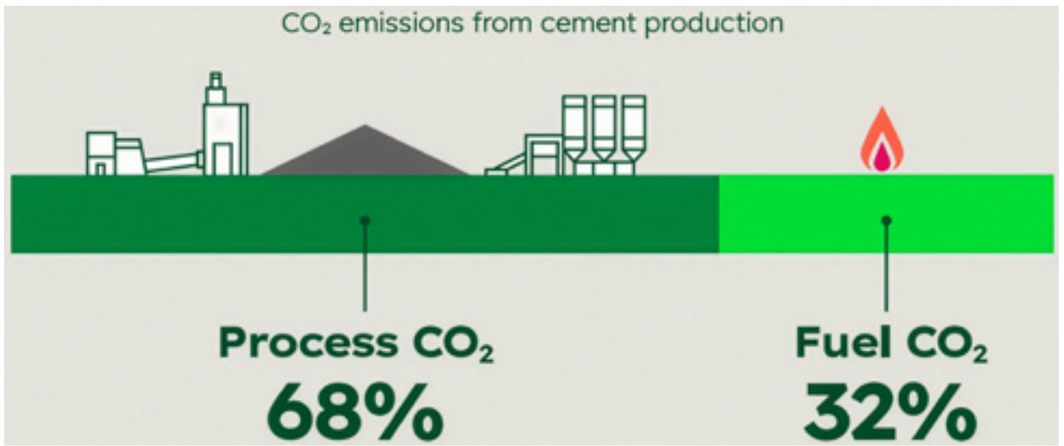
SUMMARY

Contrary to the perception of quarries as barren and dusty, extraction sites can offer significant opportunities for biodiversity, habitat creation, and species conservation. Since 2012, the Quarry Life Award (QLA), part of Heidelberg Materials' Corporate Social Responsibility and Nature Strategy, has promoted innovative, science-based, and community-driven biodiversity projects in and around quarry sites. The competition encourages collaboration between scientists, educators, conservationists, and local communities to develop practical solutions that restore habitats, protect species, and generate long-term environmental and social value.

With over 450 projects implemented across more than 25 countries, the QLA has distributed over €400,000 in international prize funding and integrated successful initiatives into long-term site management. Outcomes include restored ecosystems, new habitats, conservation of threatened species such as *Talbotiella gentii*, and educational programmes that promote environmental literacy. By engaging nearly 1,000 researchers and reaching thousands of stakeholders, the initiative strengthens community relations and sets benchmarks for biodiversity management in the extractive sector. The QLA exemplifies Heidelberg Materials' commitment to biodiversity stewardship, demonstrating the positive role of the private sector in addressing global biodiversity loss while inspiring future conservation leaders.

IN DETAIL

Contrary to the common assumption that quarries are dusty and barren, extraction sites provide a wide range of opportunities for biodiversity, habitat creation, and species conservation. Since 2012, the Quarry Life Award (QLA) has sought to enhance the ecological value of these sites by supporting innovative, science-based, and community-driven biodiversity projects. The competition forms a core part of Heidelberg Materials' broader Corporate Social Responsibility (CSR) and Nature Strategy, encouraging individuals and teams to explore, understand, and improve biodiversity in and around quarry environments. By focusing on local impact at a global scale, the QLA aligns with the Kunming-Montreal Global Biodiversity Framework targets,



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highlighting the private sector's critical role in reversing biodiversity loss.

The QLA encourages collaboration between scientists, educators, conservationists, and local communities, producing practical solutions that protect and restore habitats while generating lasting environmental and social benefits. It rewards excellence in scientific research and community engagement, ensuring that biodiversity conservation is embedded in quarry operations and local development plans.

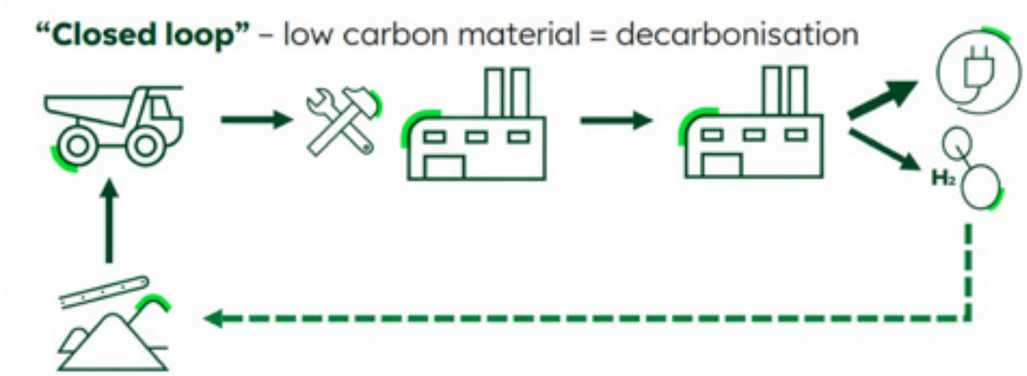
Since its inception, the QLA has attracted project proposals from over 25 countries, with more than 450 projects selected for implementation. In the International Competition alone, over €400,000 has been awarded to fund over 30 winning projects, not including national awards. Measurable outcomes include the creation of new habitats, restoration of degraded ecosystems, conservation of threatened or critically endangered species such as *Talbotiella gentii*, and development of educational programmes. Many projects have been incorporated into long-term site management, enhancing ecological resilience and local biodiversity.

The competition has engaged nearly 1,000 researchers and conservationists and reached thousands of stakeholders, including local communities, NGOs, and public authorities. By transforming quarries into living laboratories and outdoor classrooms, the QLA promotes environmental literacy, inspires future conservation leaders, and strengthens community trust and collaboration. Educational trails, green spaces, and recreational areas resulting from projects benefit both biodiversity and human well-being.

Over the past five editions, the QLA has developed new ecological restoration techniques tailored to quarry environments, increased scientific understanding of quarry-specific ecosystems, strengthened partnerships between Heidelberg Materials and academic, governmental, and non-governmental organisations, and integrated successful projects into long-term quarry management. International recognition from bodies such as the European Cement Association CEMBUREAU highlights the initiative's role in setting

benchmarks for biodiversity management in the extractive sector.

Looking ahead, the QLA will continue to evolve, exploring themes such as climate resilience, ecosystem services, and digital innovation in biodiversity monitoring. It aims to expand its reach, engaging more countries and communities, while carefully analysing past outcomes to inform global best practices in biodiversity management. The initiative exemplifies how businesses can drive innovation, education, and conservation through responsible environmental stewardship, creating a net positive impact on nature and inspiring the next generation of environmental innovators.



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HEIDELBERG MATERIALS

CRIGGION HYDROGEN PROJECT

SUMMARY

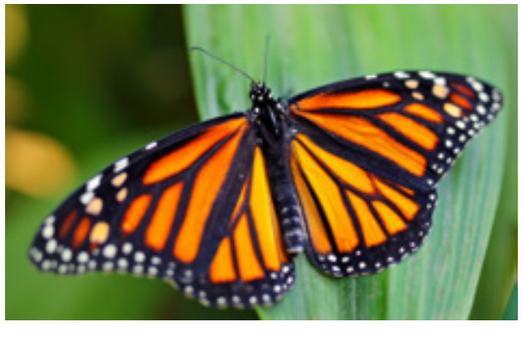
The Criggion Hydrogen Project is pioneering the use of hydrogen in asphalt production, aiming to reduce carbon emissions while maintaining operational stability. Asphalt plays a vital role in national infrastructure, keeping supply chains active and communities connected, yet it is relatively carbon intensive at 20 kgCO_2/tonne for Scope 1. This project seeks to demonstrate the technical performance, economic feasibility, and environmental impact of running an asphalt plant on hydrogen using a multi-fuel burner. It forms part of the Bay Hydrogen Hub consortium, alongside the UK National Nuclear Laboratory, EDF Energy, and Vulcan Burners, building on the consortium's 2023 feasibility study. The ultimate goal is to develop a replicable model for clean hydrogen deployment within the asphalt sector, with strong knowledge sharing, community engagement, and transferable insights for other industrial processes.

IN DETAIL

The Criggion Hydrogen Project is designed around an innovative multi-fuel burner capable of operating on three fuels, including hydrogen. This flexibility ensures long-term operational stability while allowing decarbonisation of the asphalt process when economically viable. The trials will carefully assess technical performance, economic feasibility, and environmental impact, providing insights that can be applied across the industry in the future. These findings will not only inform best practices for asphalt production but also provide guidance for other high-temperature industrial processes seeking to adopt low-carbon solutions.

Stakeholder engagement has been central to the project's success. Support from internal departments, customers, suppliers, and the local community—including National Highways and local councils—has enabled the project to progress effectively. Knowledge sharing is a key priority, with findings disseminated through multiple events, awards, and sector conferences, reaching audiences in sustainability, construction, and nuclear energy. These activities ensure that lessons learned are widely understood and can be adopted by other organisations pursuing similar decarbonisation goals.

Safety is treated as the highest priority throughout the project. Comprehensive hazard and safety studies have informed the design and operational approach, while the team has expanded its understanding of COMAH and hazardous substances regulations. These learnings are



relevant beyond the asphalt industry and have been shared widely, demonstrating the project's broader contribution to safe and sustainable industrial practice. The project therefore represents a holistic approach, combining technical innovation, rigorous safety standards, and active community collaboration to create a model for low-carbon asphalt production that can be replicated across the UK and beyond, setting a benchmark for future sustainable industrial initiatives.

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KEY ENVIRO SOLUTIONS & 25 NORTH COLONNADE

25 NORTH COLONNADE LONDON E14

SUMMARY

25 North Colonnade is a 15-floor commercial building in Canary Wharf, London, standing 80 metres (262 ft) tall, and previously occupied by the Financial Conduct Authority. Completed in 1991 and fully refurbished in 2021, the building offers 360,000 ft² of space, including Market Halls retailers (3 bars and 8 restaurants), a gymnasium, and various corporate offices specialising in banking and insurance. On an average day, approximately 3,500 occupiers visit the building.

In partnership with Key Enviro Solutions and Spectrum Recycling Ltd, 25 North Colonnade has implemented sustainable waste management practices to improve recycling and energy efficiency. Between March 2023 and March 2025, recycling rates increased from 55% to 71%, with a total of 276 tonnes of waste recycled, including seven segregated waste streams. Annual initiatives such as Waste Awareness Days and a River Cleanup Event engage tenants and promote environmental responsibility.

Additional sustainability measures include ISO 14001 accreditation, use of EURO 6 ULEZ compliant vehicles, photovoltaic panels, water conservation, low nitrogen oxide boilers, a 16 km Brise Soleil to reduce overheating, and a BREEAM rating of ‘Very Good’. Future projects for 2024/25 include coffee cup recycling, a clothing recycling drive with Traid, and a gum recycling initiative.

IN DETAIL

25 North Colonnade is a striking, multi-tenanted commercial building located in the heart of Canary Wharf, London. Completed in 1991 and fully refurbished in 2021, the building comprises 15 floors and stands 80 metres (262 ft) tall. It provides 360,000 ft² of space, which houses Market Halls retailers (3 bars and 8 restaurants), a gymnasium, and offices for corporate companies specialising in banking and insurance. On an average day, the building welcomes around 3,500 occupiers.

The building’s target is to maintain and increase its recycling rate beyond 71% while improving overall energy efficiency. Working in partnership with Key Enviro Solutions and Spectrum Recycling Ltd, 25 North Colonnade has focused on providing sustainable waste management services for tenants. All partners ensure the waste hierarchy is applied consistently. In 2024, objectives included segregating at least two new waste streams, increasing recycling tonnage, and reducing costs.

Achievements (March 2023 – March 2025)

- Recycling rate increased from 55% to 71%.
- Recycling tonnage increased by approximately 39 tonnes.
- Waste streams segregated increased from five to seven (General Waste, Cardboard, Mixed Recycling, Glass, Food, WEEE items, and toner cartridges).
- Annual Waste Awareness Days engage tenants and internal cleaning teams through interactive activities, follow-ups, and presentations.
- River Cleanup Event in April 2025 involved 15 tenants collecting general and recyclable waste, with more events planned for the year.

Implementation and Engagement

The increase in recycling was achieved through tenant engagement, training, and ensuring correct segregation using on-site receptacles. Waste is weighed individually and billed back to tenants. Key Enviro Solutions operatives sort and weigh all waste leaving the building. The introduction of WEEE items and print toners as new waste streams has further enhanced recycling performance. Account management teams attend occupier meetings to provide updates, promote initiatives, and educate on government legislation such as Simpler Recycling, boosting the building’s green credentials.

Sustainability and Energy Efficiency Measures

- ISO 14001 Environmental Sustainability accreditation.
- Weightron system to individually weigh all waste streams for tenants, encouraging efficient recycling and cost reduction.
- EURO 6 ULEZ compliant vehicles for waste collection.
- Waste transported via barge along the River Thames to a WtE plant in Belvedere, providing electricity to the national grid.
- Low nitrogen oxide-emitting boilers and zero ozone-depleting materials.
- Water conservation through sanitary sensors, selectors, and shutoff valves.
- Photovoltaic panels on the roof generating renewable electricity.
- 16 km Brise Soleil above high-performance glazing to prevent glare and reduce overheating, saving air-conditioning energy.
- BREEAM rating of ‘Very Good’.
- Beekeeping implementation providing green spaces and promoting sustainability, with plans to incorporate coffee grounds in the process.
- 255 bicycle spaces to encourage sustainable commuting.

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Future Projects (2024/25)

- **Coffee Cup Recycling:** Separating paper and plastic to create items such as shopping bags, notebooks, and cardboard.
- **Clothing Recycling Drive (Traid):** Diverts 3,000 tonnes of clothes from landfill each year, promotes reuse, reduces carbon emissions, funds international development, and educates on sustainable textile choices.
- **Gum Drop Initiative:** Recycles chewing gum (polyisobutylene) into products such as coffee cups and rubber boots, helping reduce the £50M annual UK street-cleaning costs.

25 North Colonnade’s ongoing commitment to sustainability, recycling, and energy efficiency demonstrates a holistic approach to environmental responsibility, tenant engagement, and operational excellence, with multiple projects planned to enhance its green credentials in the coming years.

LANDSEC

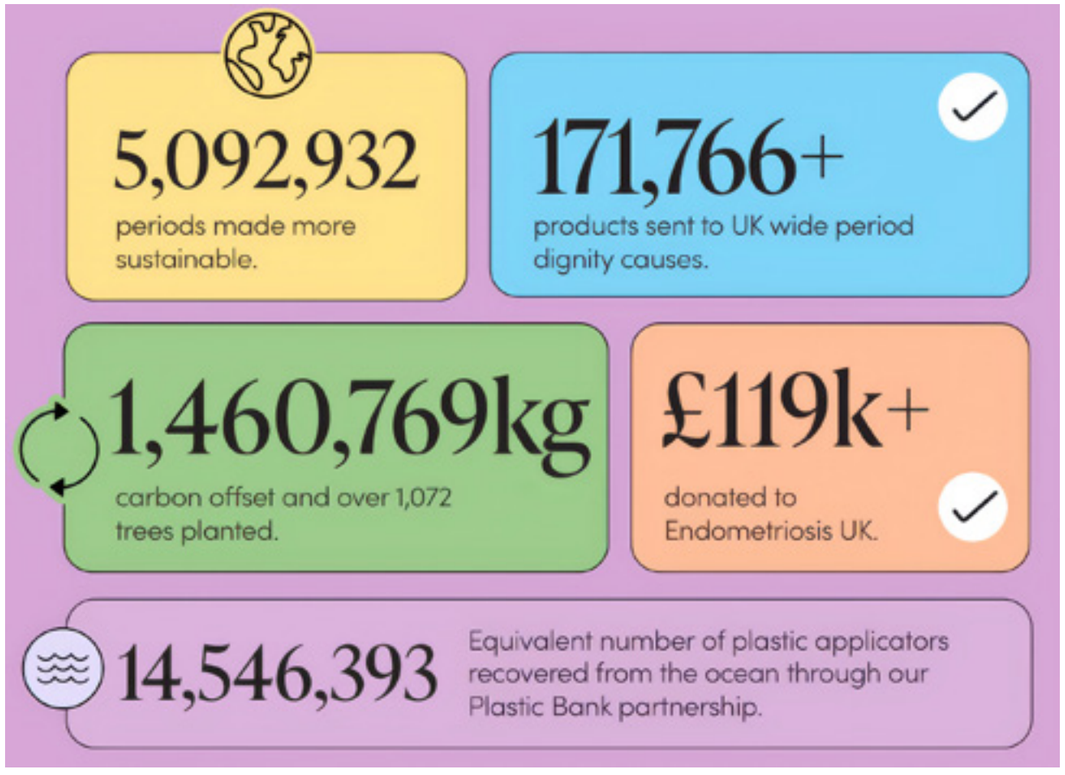
TOTM - TACKLING PERIOD STIGMA AND PLASTIC WASTE WITH SUSTAINABLE WORKPLACE PRACTICES

SUMMARY

In the UK, period stigma and period poverty affect workplace wellbeing, with 12% of women experiencing period poverty. Conventional period products generate 200,000 tonnes of waste annually, with 90% containing plastic that can take up to 500 years to decompose. In partnership with TOTM, sustainable period care was introduced in the workplace, providing free plastic-free products, hosting awareness events, donating products to vulnerable individuals, and reducing environmental impact. Over 10,080 sustainable period products were supplied, eliminating 53.3 kilograms of plastic waste and contributing a net benefit of 106.6 kilograms. The initiative aligns with UN Sustainable Development Goals 3, 5, 12, and 13 and was rolled out in phases, including planning, training, engagement, and feedback. It follows a four-pillar approach: providing sustainable period care, educational outreach, driving social impact, and reducing environmental impact.

IN DETAIL

This initiative exemplifies how workplace-level actions can tackle critical social and environmental challenges, positioning us as a leader in sustainable, inclusive, and scalable CSR practices. The initiative has delivered measurable outcomes, with over 10,080 sustainable period products supplied across the workplace. As part of the scheme linked to In-Kind Direct, 53.3 kilograms of plastic waste have been eliminated, and the same amount of ocean-bound plastic has been removed, creating a net benefit of 106.6 kilograms.



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Beyond the workplace, the initiative donated period care products to vulnerable individuals and supported menstrual health advocacy through Endometriosis UK. All of the measurable outcomes are detailed within the yearly impact report driven with our partners to help showcase the actual impact this initiative has. This initiative aligns seamlessly with the UN's Sustainable Development Goals, specifically SDG 3, Good Health and Wellbeing, SDG 5, Gender Equality, SDG 12, Responsible Consumption and Production, and SDG 13, Climate Action.

We are continually looking at the impact of our operations as part of the building sustainability and wellbeing strategy. This recognises that the success of business, society and the environment are connected and that we must address them together to create meaningful and impactful solutions. As a result, we research the market with our suppliers for market-leading initiatives to further our sustainable ambitions and business purpose. Working with our suppliers, TOTM, an ethical period care brand, we address critical issues of period dignity, period poverty, and environmental sustainability in our workplace.

Recognising the challenges currently around period poverty, we launched this initiative within the workplace to provide free sustainable, plastic-free period care to our occupiers on site, raise awareness about menstrual health and tackle period stigma, and contribute to broader environmental goals, such as reducing plastic waste and supporting ocean plastic recovery.

The initiative was rolled out in phases to ensure maximum impact. TOTM's Account Manager conducted engagement sessions and planning meetings within the workplace to raise awareness about menstrual health and tackle period stigma. Interactive pop-up sessions and talks encouraged participation from the building management team and services, and feedback mechanisms ensured all voices were heard. Feedback from occupiers was used to ensure they understood the what, why and how.

A holistic, four-pillar approach underpins the initiative. Providing sustainable period care ensures the washrooms within the workplace now feature sustainable, plastic-free period care products, giving employees access to safe, eco-friendly options and eliminating the need for conventional, plastic-laden alternatives. Educational outreach was central to the initiative, hosting pop-up sessions and expert-led talks within the workplace to help break the stigma, while discussions on menstrual health and sustainability showed how small changes in period care habits contribute to environmental and social impact. Driving social impact extends beyond the workplace, with donations to In-Kind Direct ensuring access to period care for vulnerable individuals and support for Endometriosis UK through workplace product purchases, contributing £50.40 to menstrual health advocacy and research. Reducing environmental impact was achieved by switching to plastic-free products, recovering 53.3 kilograms of ocean-bound plastic through TOTM's partnership with Plastic Bank, offsetting the workplace's environmental footprint.

We continue to assess the impact of our operations as part of the building sustainability and wellbeing strategy, recognising that the success of business, society, and the environment are connected and that they must be addressed together to create meaningful and impactful solutions.

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MURPHY

PLANT TEAM SUSTAINABILITY AT MURPHY

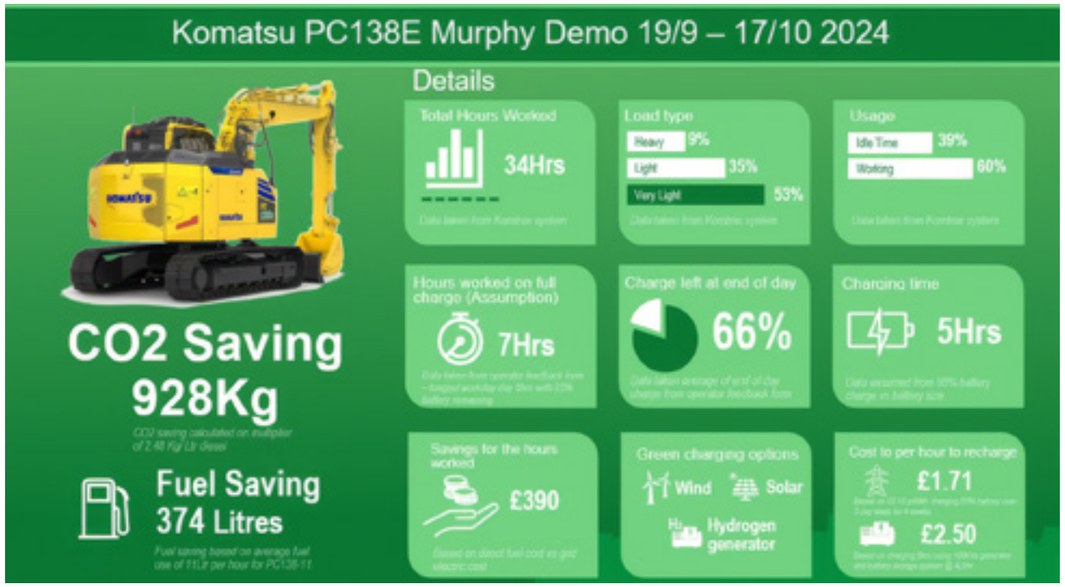
SUMMARY

Plant Team Sustainability at Murphy demonstrates the integration of cleaner, low-carbon technologies across multiple projects. At Elstree Substation, the site transitioned fully to Hydrotreated Vegetable Oil (HVO), reducing around 105 tonnes CO_2e, and deployed the UK's first fully electric 13-tonne excavator, achieving >99% CO_2 reduction and saving 374 litres of fuel. At Yorkshire Green, the Responsible Plant Use campaign trialled eco-operator training, auto-idle shutdown, e-mode startup, and maintenance measures at Overton and Monk Fryston sites, cutting fuel use, costs, and emissions by 10–20%. On the TransPennine Route Upgrade, a fully electric telehandler operated at the Joseph Lynn Hub, enabling zero-emission material handling and saving 5.6 tonnes CO_2e annually. Across all sites, the plant team combined renewable fuels, electric machinery, and data-led operational measures to improve efficiency, reduce carbon emissions, and support Murphy's Climate Action Transition Plan and long-term £150 million investment in state-of-the-art, low-carbon plant and equipment.

IN DETAIL

Elstree Substation Project

The Elstree 132kV GIS Substation was extended to add two new customer circuits and an additional SGT bay, increasing power capacity to support growing demand. Since December 2023, the site transitioned fully to Hydrotreated Vegetable Oil



(HVO) as its primary fuel, a renewable alternative to traditional fossil fuel. This change resulted in a reduction of approximately 105 tonnes of CO_2e to date, reflecting a significant step in reducing greenhouse gas emissions on-site.

From 19 September to 17 October 2024, the UK's first fully electric 13-tonne excavator was deployed at Elstree. Powered by a high-capacity ion battery with an integrated cooling system, the machine performed identically to a standard fossil fuel model while achieving a >99% reduction in CO_2 emissions and saving 374 litres of fuel. Charging required around eight hours overnight, and operational time varied depending on task intensity, with optimal use lasting 7–8 hours per shift and heavier use around four hours. The excavator required a 64-amp charger with a 16-metre cable and was best suited to substation work with connection to mains electricity.

Yorkshire Green – Responsible Plant Use Campaign

Murphy implemented the Responsible Plant Use campaign at the Yorkshire Green Project, which involves upgrading and reinforcing high-voltage electricity infrastructure across nine sites in North Yorkshire, including new build Air Insulated Switchgear (AIS) substations at Monk Fryston and Overton. The campaign aimed to optimise plant operation, improve fuel efficiency, and reduce carbon emissions.

Key measures included eco-operator training delivered on-site, combining practical and theoretical sessions tailored to project operations. Compatible machines were configured with auto-idle shutdown to reduce fuel consumption during extended idling, and e-mode startup to ensure machines restarted in eco-mode. Maintenance actions, such as component replacements and providing operatives with personal grease guns, supported efficient plant operation. Telematics data were monitored continually to identify trends, highlight performance improvements, and inform operational decisions. The trial is expected to reduce fuel costs by 10–20% and deliver both environmental and financial benefits, with insights from the six-month programme informing potential wider adoption across the business.

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TransPennine Route Upgrade – TRU East

Murphy's plant team supported the York to Leeds section of the multi-billion-pound TransPennine Route Upgrade (TRU), which aims to deliver faster, more reliable, and greener journeys across the Pennines. A fully electric Faresin 6.26 telehandler operated in Area 2 of the Joseph Lynn Hub (JLH), handling deliveries across three buildings, including general stores, overhead line equipment, and signalling components. The telehandler has a lift capacity of 2.6 tonnes and can lift up to 2 tonnes at its maximum height of 5.9 metres.

Powered entirely by an electric drive unit, the telehandler produced zero emissions, saving 108kg of CO_2e per week and 5.6 tonnes annually, equivalent to driving a petrol car 14,261 miles. Charging is performed on-site using a 450V fast charger, achieving full charge in three hours, sufficient for two to three days of operational use. A four-tonne electric telehandler is being considered for future inclusion to support heavier lifting requirements, further reducing reliance on fossil fuel plant.

NANOPOOL

PLASTIC FREE PACKAGING

SUMMARY

The project has demonstrated that Siopack-coated glassine can function as a fully recyclable, transparent packaging window, replacing plastic in real retail applications. In a pilot with a major European grocery chain, bakery bags with plastic windows were replaced by Siopack-enhanced glassine versions, resulting in a significant reduction in plastic waste with no compromises in visibility, freshness, product protection, or barrier performance. The solution was positively received and is considered ready for full-scale implementation.

The technology is fully compatible with existing packaging and converting processes, requiring no retrofitting. Following the pilot, discussions began with paper manufacturers and packaging converters across Europe to enable industrial-scale production across multiple sectors. The coating system is patent pending, certification-ready for food contact and compostability, and offers measurable plastic-saving potential.

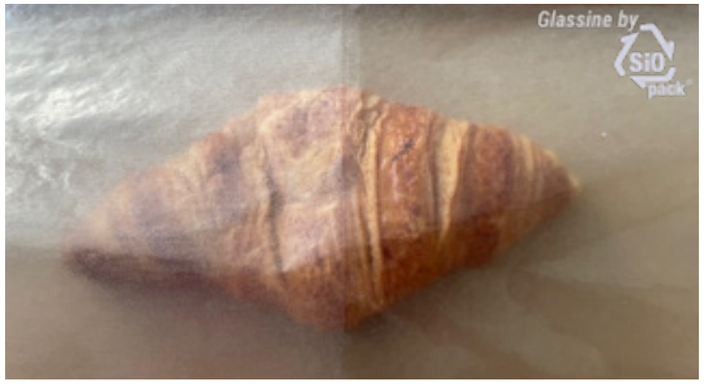
IN DETAIL

The project aimed to transform glassine paper, a sustainable and compostable base material, into a fully recyclable, transparent packaging window capable of replacing plastic. Using the patented Siopack® coating, glassine was functionally enhanced to achieve significantly improved clarity, barrier performance, and industrial compatibility. The coating can be applied inline or offline on standard equipment, with hot air or infrared drying, and is compatible with machine-glazed papers ranging from 28–60 g/m². No retrofitting or system changes were required.

In cooperation with a leading European retail company, a pilot run replaced single-use bakery bags with plastic windows with Siopack-coated glassine versions. The pilot confirmed that there were no compromises in visibility, product protection, freshness, moisture resistance, grease resistance, or barrier performance. The bags were positively received by both consumers and store staff, confirming operational readiness and market acceptance.

Technical validation demonstrated measurable improvements. Haze was reduced from approximately 70–80 to 35–40, and light transmission increased by 50% compared with untreated paper. The material is water- and grease-resistant, food-safe (certifiable), and fully recyclable within the paper stream. Compostability depends on the substrate. An oxygen transmission rate (OTR) barrier version is in development for oxygen-sensitive product categories.

The environmental impact is quantifiable. Europe uses over 100 billion plastic-based transparent packaging units annually, most of which are non-



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recyclable. Replacing just 10% of this volume with Siopack-coated glassine would save over 150,000 tonnes of plastic waste per year. The material is designed for recycling within existing paper streams, reducing fossil-based waste without disrupting current infrastructure.

Following the pilot, discussions began with leading paper manufacturers and packaging converters across Europe to enable mass production and broader application across sectors including dry foods, non-food items, logistics, quick-service restaurants, and e-commerce packaging. Industry interest has been confirmed, including interest in the future OTR variant.

The innovation lies in combining Siopack coating technology with glassine to create a new category of recyclable transparent packaging with barrier function. From a retail perspective, the solution provides a scalable, regulation-compliant, sustainable alternative. From a consumer perspective, it offers ecological packaging without compromising visibility or product protection. From an industrial perspective, it provides a plug-in solution compatible with current processes. From an environmental perspective, it reduces plastic waste and fossil-based materials.

The project was privately financed by the shareholders of Nanopool GmbH. Financial details have not been disclosed. The coating system is patent pending and certification-ready for food contact and compostability. OTR testing is planned for further application phases. This submission represents the first external award application for the further development of Siopack on glassine paper for transparent window packaging. A previous development from the Siopack technology platform received the Green World Award in 2020 for plastic-free barrier packaging applications, including drinking cups, ice cream, and frozen food packaging.

Nanopool operates in accordance with internal environmental standards and established governance and management systems. Over more than 20 years, there have been no indications of violations leading to regulatory action. Compliance with legal and regulatory requirements forms part of the company's culture.

The project demonstrates that sustainable packaging innovation does not require radical disruption, but rather the intelligent enhancement of existing materials through targeted technology, delivering visible, functional, recyclable solutions at industrial scale.

NORDIK RETAIL

NO NEED TO FLICK ANYTHING ANYWHERE ANYMORE

SUMMARY

Reduce global cigarette butts with smart, accessible design by promoting responsible smoking and scaling via cities, events, and brands—making Nanobin the standard for cigarette disposal worldwide. The protected eco-ashtray was launched in Europe and received positive feedback from cities and retailers. EU-made with sustainable materials, it drives behaviour change and gains growing brand recognition.

IN DETAIL

The Nanobin project involved launching a recyclable, pocket-sized ashtray to combat cigarette butts—a major global environmental issue. It was created to offer a practical, user-friendly alternative to tossing butts on the ground. The project was self-funded by founder Alice Hertz Dahl, with some early revenue from sales to municipalities and retailers.

Nanobin has helped reduce cigarette butts in cities and at events, promoting sustainable behaviour change. Beneficiaries include smokers, city services, and the environment. Long-term, the project aims to normalise responsible smoking globally and make Nanobin the standard for cigarette disposal worldwide.

Its innovation lies in its simplicity, its disposability in the litterbin, and its behaviour-driven design. The concept is scalable and replicable for cities, NGOs, and brands. The protected eco-ashtray is EU-made using sustainable materials and has gained growing brand recognition, including recognition in sustainability media.

The team has learned that small design changes can shift habits. Future plans include scaling manufacturing, expanding markets, and developing related products.

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PARC TROSTRE RETAIL PARK

ENCOURAGING AN IMPROVED ATMOSPHERE THROUGH NATURE

SUMMARY

Parc Trostre is a 22-acre outdoor retail park in Llanelli, South Wales, with 35 retail units and a 1,009-space car park, attracting approximately five million customers annually. The park features landscaped areas that provide wildlife habitats and tranquil spaces for visitors.

Since 2020, Parc Trostre has run the project “Encouraging wildlife through nature”, creating habitats and food sources for bees, butterflies, and other wildlife. In 2025, a new initiative focused on improving air quality and supporting climate change mitigation was introduced by planting bamboo. Thirty-five bamboo plants—Phyllostachys Aurea, Phyllostachys Bissei, and Fountain Bamboo—*were installed throughout the park, including in repurposed stainless steel waste bins. Each bamboo plant absorbs up to 12 kg of CO_2 per year, helps prevent soil erosion, produces oxygen, and filters pollutants including methane and black carbon.

Future plans include introducing additional carbon-absorbing plants, green-roofed cycle shelters, living walls, and a community campaign encouraging tree and bamboo planting, alongside the ongoing wildlife project.

IN DETAIL

Parc Trostre’s landscaped areas are designed to support wildlife while providing visual and calming benefits to customers and the local community. The park is near the South Wales coastline, with easy access to coastal pathways, country parks, and nature trails, allowing visitors to engage with the surrounding natural environment.

The 2025 bamboo project was developed to complement the existing wildlife programme and focus on improving local air quality. Bamboo was chosen for its environmental benefits: it grows quickly (maturing in about three years versus 25 for trees), thrives in a wide range of soil conditions, regenerates naturally when harvested or cut, and is resistant to pests and diseases. Bamboo can replace fossil fuels either as gas for heat and electricity or as a biodegradable alternative to plastics and metals.

Three bamboo species were planted: Phyllostachys Aurea, Phyllostachys Bissei, and Fountain Bamboo. Thirty-five plants, each approximately 1.5 metres tall, were installed in April 2025. Some were planted directly into the ground using non-invasive species, while others were placed in repurposed stainless steel customer waste bins, which were removed to make space for recycling bins. This reuse saved approximately £13,600. Coffee grounds and park compost were used as fertiliser.

Bamboo has multiple environmental benefits. Each plant absorbs up to 12 kg of CO_2 annually, equivalent to a small car driving roughly 50 miles, with 35 plants collectively sequestering around 420 kg of CO_2 per year. Bamboo stores CO_2 in its root system, helps prevent soil erosion by binding soil, produces more oxygen than trees, and acts as a pollution filter for short-lived climate pollutants such as methane and black carbon, which contribute 45% of global warming.

The bamboo installation has also had social and aesthetic benefits. Customers and tenants have commented positively on the calming and attractive appearance of the plants.

Looking ahead, Parc Trostre plans to expand its environmental initiatives, including planting additional carbon-absorbing species such as ivy and aloe vera, introducing cycle shelters with green roofs, and creating living walls. The park is also preparing a community campaign to encourage local residents to plant bamboo or trees, aligning with its annual nature photography competition, which will have a “Trees” theme this year.

The ongoing “Encouraging wildlife through nature” project will continue alongside these initiatives, ensuring that biodiversity, climate action, and community engagement remain central to Parc Trostre’s environmental strategy.

PURAGEN

WASTE REDUCTION IN THE BIOGAS INDUSTRY

SUMMARY

The project aimed to reduce the amount of waste activated carbon sent to landfill by biogas and biomethane operators by developing a method for recycling high-sulphur spent carbons. Activated carbon is widely used in the industry to remove hydrogen sulfide (H2S) and VOCs from gas streams, but spent carbons with high sulphur levels were previously considered untreatable and disposed of as hazardous waste. Puragen has developed a proprietary process, operational since late 2023, that allows these heavily-loaded spent carbons to be recycled at its UK thermal reactivation facility. The technology handles spent carbons with up to 80% sulphur loading, converting what was previously waste into reusable activated carbon for biogas purification, odour control, and industrial emissions reduction. This first-to-market solution prevents thousands of tonnes of waste annually, reduces disposal costs for operators, and enhances the sustainability of biogas and biomethane as renewable energy sources.

IN DETAIL

Activated carbon filtration is a critical process in the biogas and biomethane industry, used to remove hydrogen sulphide (H2S) and volatile organic compounds (VOCs) from gas streams before energy generation or grid injection. H2S is toxic, corrosive, and odorous, causing severe damage to downstream combined heat and power (CHP) engines or preventing biomethane from reaching the quality standards required for grid injection. Activated carbons impregnated with specific chemical functional groups react with H2S, leaving elemental sulphur on the carbon surface and thereby

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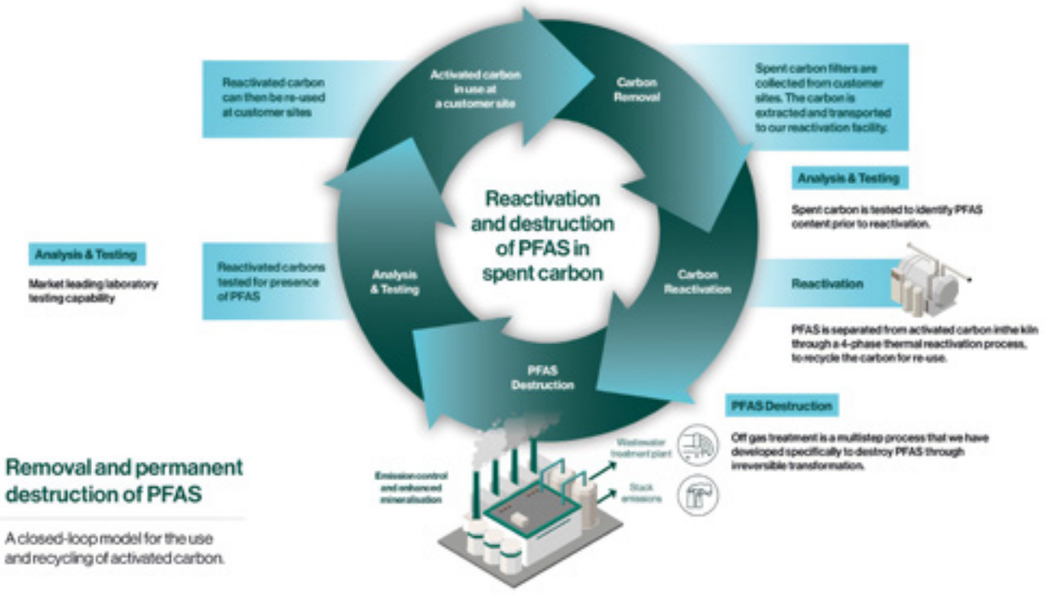
purifying the gas stream.

Historically, spent carbons with low sulphur loadings could be safely recycled via modified thermal reactivation, saving over 85% of the carbon footprint compared to using virgin activated carbon. However, improvements in activated carbon performance have led to higher sulphur loadings, with 40% now considered normal. Conventional thermal reactivation kilns cannot process these heavily-loaded carbons because heat generates elemental sulphur that deposits on kiln internals, while residual moisture can form sulphurous acid, causing corrosion. Any sulphur in the off-gases could also form sulphur dioxide (SO_2), a toxic and environmentally harmful gas. As a result, spent carbons from the biogas sector have traditionally been disposed of as hazardous waste.

Puragen's research and development team, including Technical Director Andy Leatt FRSC, R&D Manager Dr. Andrew Gill, and QC Laboratory Team Leader Liz Balch, developed a proprietary process, referred to as 'CR3', to overcome these challenges.



This process safely and economically removes sulphur contamination from spent carbons, allowing them to be recycled for biogas purification, odour control, and industrial air emissions abatement. Lab studies have demonstrated the technology can handle spent carbons with sulphur loadings of up to 80%, significantly exceeding current market requirements and future-proofing the process.

Operational since late 2023, the UK-based thermal reactivation facility is the first in the industry to offer this capability. Spent media previously considered waste is now converted into a reusable feedstock, preventing several thousand tonnes of waste from being landfilled or incinerated annually. This innovation not only reduces disposal costs for biogas and biomethane operators but also enhances the environmental credentials of the sector by eliminating the use of single-use activated carbons and supporting the circular economy.

This breakthrough represents a technological step-change for the biogas and biomethane industry, addressing a long-standing problem with high-sulphur spent carbons and providing a sustainable solution to maintain the reliability and quality of renewable energy production. The achievement positions Puragen as a first-to-market provider of this solution, demonstrating both technical expertise and a significant contribution to the broader adoption of sustainable energy sources.

SAUDI ARAMCO

PIPELINE BERM STABILIZATION WITH CHEMICAL POLYMER T-30

SUMMARY

T-30 is an advanced polymer technology specifically designed to stabilise soil by forming a hard, wear-resistant crust that prevents sand movement and erosion. The polymer penetrates the soil surface, filling the spaces between soil particles to create a durable film that binds them together, enhancing soil structure and stability. Environmentally safe and non-toxic, it does not harm plant growth, wildlife, or the surrounding ecosystem. Reviewed and approved by Aramco and the Environmental Protection Department, T-30 aligns with sustainability goals, supports safer sand management, improves operational efficiency, and has been successfully applied in multiple regions, with plans for further expansion to new locations, contributing to local economic development.

IN DETAIL

T-30 is a highly advanced polymer technology specifically engineered to infiltrate and stabilise the soil surface. When applied, the polymer penetrates the topsoil, filling the spaces between soil particles and forming a continuous, durable film. This film bonds the soil or sand particles together, creating a hard, wear-resistant crust that effectively prevents the movement of sand and reduces surface erosion. By stabilising the soil structure in this way, T-30 enhances both the safety and efficiency of areas susceptible to sand displacement.

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The product meets Aramco's standards for environmentally friendly chemical polymers, and its safety and sustainability profile has been reviewed and approved by the Environmental Protection Department. This demonstrates its compliance with both industrial and environmental regulations, ensuring it can be applied safely without causing harm to the surrounding ecosystem.

T-30 is fully environmentally friendly and offers multiple benefits: it is non-toxic to animals, non-corrosive, non-inhibitive to plant growth, free from heavy metals and other toxic elements, non-flammable, and environmentally safe. These properties make it suitable for use in sensitive ecological areas and align with broader goals of environmental stewardship and sustainability.

The technology is designed to support several strategic objectives, including alignment with circular economy principles, promotion of environmental sustainability, adoption of innovative technologies, and the improvement of health, safety, and environmental standards by preventing uncontrolled sand movement.

A key achievement of T-30 is its role in enhancing operational efficiency while maintaining high environmental and safety standards. By creating a durable crust on the soil surface, it reduces maintenance requirements and minimises the risks associated with loose sand, contributing to more stable and predictable working environments.

The Southern Area Pipelines Department (SAPD) has already implemented T-30 in multiple regions with notable success. Following these achievements, there are plans to expand its application to new locations, supporting ongoing innovation and contributing to local economic development. The use of T-30 demonstrates a practical, sustainable approach to soil stabilisation that benefits both operational efficiency and environmental protection.

SAUDI ARAMCO SAPD

DESIGN AND SIMULATION OF CATHODIC PROTECTION (CP) SYSTEMS

SUMMARY

As one of the world's largest integrated energy and chemicals companies, we are committed to sustainable energy solutions and supporting the global transition to a net-zero economy. In line with Saudi Arabia Vision 2030 and Aramco circular economy initiatives, we apply climate risk assessments and vulnerability modelling to strengthen the resilience of pipeline infrastructure. The solar-powered cathodic protection (CP) system mitigates corrosion while replacing hydrocarbon-based electricity with renewable energy, improving operational reliability in remote areas and reducing environmental impact. Recognised with the 2025 Environmental Energy Leader Award, the project integrates scientific modelling, renewable energy, advanced materials, and IoT monitoring, demonstrating the company's leadership in sustainable energy innovation and long-term infrastructure sustainability.

IN DETAIL

Building on this overview, we employ advanced tools and strategies to ensure that pipeline infrastructure withstands climate-related stressors. Historical climate data and predictive models guide evaluations of temperature fluctuations, solar radiation, and environmental factors that could affect the performance of the CP system. Through simulation and vulnerability modelling, software such as HOMER and Excel-based tools are used to assess the performance of solar-powered CP systems under diverse climate conditions. Energy demand is compared with solar power supply to maintain system reliability even during extreme weather, while battery storage requirements are determined to optimise protection during periods of low solar output. Life Cycle Cost Analysis evaluates the economic feasibility and long-term sustainability of each system, allowing configurations that balance resilience with reduced carbon emissions and operational risks.

Future adaptation strategies focus on several complementary areas. Integrating solar photovoltaic power into CP systems replaces diesel generators and conventional electricity, improving reliability in remote locations and supporting circular economy objectives. Advanced materials and coating technologies are being explored, including smart coatings with self-repairing properties, nanotechnology-enhanced anodes, and temperature-resistant batteries, which collectively enhance pipeline durability, reduce maintenance costs, and extend system lifespan. Digital monitoring systems, enabled by IoT technology, provide real-time data on corrosion rates, environmental conditions, and energy fluctuations. Predictive analytics based on this data allow early detection of potential failures, dynamic adjustments to CP power, and optimised maintenance schedules, ensuring uninterrupted pipeline protection while lowering long-term costs.

All adaptation measures comply with Aramco CP standards, NACE best practices, and Saudi Arabia renewable energy regulations, ensuring regulatory alignment and supporting Vision 2030 sustainability goals. The impact of implementing solar-powered CP systems is substantial: carbon emissions are reduced by over 20 tons per system annually, lifecycle cost savings exceed 4.5 million SAR, and operational expenses decline due to reduced reliance on fossil fuel-based electricity. These measures position the company as an industry leader, setting a benchmark for engineering excellence, decarbonising hydrocarbon operations, and enhancing the resilience and reliability of Saudi Arabia's pipeline infrastructure. By combining innovative technology, scientific modelling, and renewable energy integration, the company ensures that its energy infrastructure remains sustainable, efficient, and prepared for future climate challenges.

ارامكو السعودية
Saudi Aramco

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SEMAD

PSA - PAGAMENTO POR SERVIÇOS AMBIENTAIS (PAYMENT FOR ENVIRONMENTAL SERVICES)

SUMMARY

The “Cerrado em Pé” Payment for Environmental Services (PES) Program, led by SEMAD-GO, is a pioneering initiative in the Brazilian Cerrado that provides financial incentives to rural landowners and traditional communities to conserve native vegetation and restore degraded springs. By offering annual payments of up to R$664 per hectare, the programme turns environmental protection into an economic activity, prioritising regions under high ecological pressure and low Human Development Index (HDI). Its first phase successfully preserved nearly 7,000 hectares of native Cerrado, directed significant funding to traditional communities, and incorporated satellite monitoring for transparency. National recognition highlights its success in combining conservation, social equity, and sustainable rural development, establishing a model that can be replicated across Brazil.

IN DETAIL

The Cerrado em Pé programme represents the first large-scale state-led PES initiative in Brazil using its own public environmental fund. Developed and executed by SEMAD-GO, it targets the northeastern Goiás Cerrado, a biome of high ecological importance and vulnerability. Its principal goals are to conserve native vegetation beyond legal obligations, restore degraded springs, and strengthen both environmental protection and social equity in regions with considerable socio-economic challenges.

In its initial phase, the programme allocated approximately R$20 million (US$3.6 million) to support 187 rural properties, protecting almost 7,000 hectares of native savannah. These areas, often legally eligible for deforestation, were voluntarily preserved through financial compensation ranging from R$498 to R$664 per hectare annually, depending on land characteristics and restoration commitments. Notably, 30% of the funds were directed to traditional communities, such as quilombolas and smallholder farmers, ensuring inclusive benefits for socially vulnerable populations.

The programme prioritises municipalities with low HDI, including Cavalcante and Mambaí, linking conservation to sustainable rural income generation. It protects essential ecosystem services—such as water regulation, carbon storage, and biodiversity—supporting

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ecological restoration, enhancing biodiversity and the capacity of landscapes to support climate resilience.

Designed to be scalable and replicable, its legal framework, payment structure, geographic prioritisation, and monitoring protocols can be adapted to other regions and government structures. Future expansions may integrate blended finance, attracting private and multilateral investment while maintaining strong public-sector governance.

local resilience and contributing to broader climate mitigation goals. The restoration of degraded springs also enhances long-term water security in the region.

A key feature of Cerrado em Pé is its rigorous monitoring and evaluation system. Satellite imagery and geospatial analysis verify vegetation cover and property eligibility in real time, while on-site inspections ensure compliance. This transparent, data-driven approach earned national recognition, including a finalist position in the Prêmio Brasil Mais for its monitoring protocol. Contracts with beneficiaries are clear on terms, conditions, and penalties, and all funds are monitored through FEMA’s public financial reporting, with regular audits by the State Comptroller’s Office. To date, no irregularities or legal challenges have arisen, demonstrating the programme’s robust institutional and technical foundation.

The initiative is particularly significant because it safeguards areas not classified as mandatory Legal Reserves or Permanent Preservation Areas, preventing potential legal deforestation. By assigning tangible economic value to conservation, nearly 7,000 hectares of native savannah were preserved in its first phase. The programme also encourages

Cerrado em Pé stands out for its combination of policy, technology, and community engagement. It demonstrates how subnational governments can connect public finance to verified conservation outcomes, promoting environmental protection alongside social and economic development. Its allocation of funds to marginalised groups, commitment to ecological restoration, and evidence-based monitoring set a precedent for equitable, measurable, and locally led environmental initiatives. Recognition by national institutions reinforces its methodological leadership and illustrates the programme’s potential as a model for sustainable rural development across Brazil.

SEOCHO-GU DISTRICT OFFICE

REPAIRS AND RECYCLING ON WHEELS

SUMMARY

Repairs and Recycling on Wheels is a mobile repair service that fixes umbrellas, sharpens knives and restores potted plants. It is an ESG initiative designed to reduce environmental waste by encouraging resource reuse while improving residents' quality of life. Over its first year, more than 6,000 items were repaired or revived instead of being discarded, and resident satisfaction has been high. The project also delivers social value by providing employment and skills training for socially underprivileged groups, including Self-Help Work (SHW) recipients, thereby combining environmental and community benefits.

IN DETAIL

Repairs and Recycling on Wheels is a mobile public service operating throughout Seocho-gu that repairs everyday items such as umbrellas and knives and revives potted plants. The initiative aims to reduce waste by promoting reuse and enhancing residents' well-being. In its first year, over 6,000 items were successfully repaired or restored, demonstrating strong participation and positive feedback from the community. Operating via a mobile truck improves accessibility compared with traditional, location-based services, enabling residents to use the service more conveniently and frequently.

The project also supports social inclusion by employing and training individuals from disadvantaged backgrounds, including SHW recipients. Participants receive technical training in practical skills and customer interaction, creating opportunities for sustained employment and personal development rather than short-term work. Restored potted plants are distributed to schools and low-income families, fostering community sharing and improving home environments.

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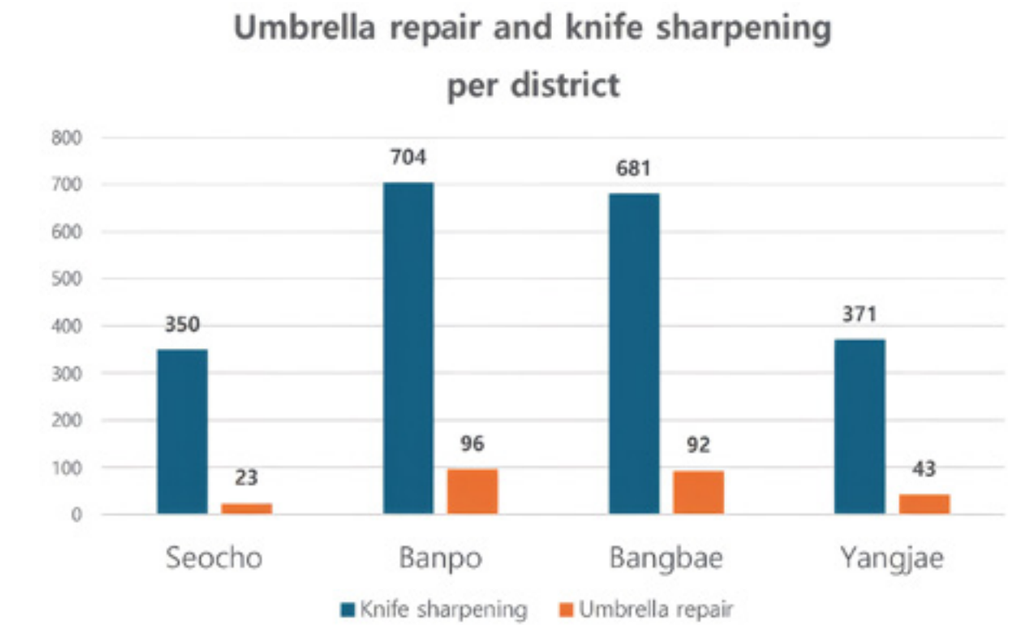
Residents have reported psychological benefits and a strengthened sense of neighbourhood connection, illustrating the broader social value of the initiative.

Media coverage from organisations such as Munhwa Ilbo, News1, Asia Today and Segye Ilbo has highlighted the project's resource-circulation welfare model and positive reception. These reports emphasise how combining environmental sustainability with social welfare can address community needs in practical and innovative ways. By reducing waste, providing employment and improving accessibility, the initiative demonstrates a holistic approach to local development.

The project's future plans include expanding services to small appliance repairs and tool rentals, recruiting additional SHW recipients and developing operational models that can be shared with other local governments. Such expansion aims to strengthen environmental benefits and create further employment opportunities while replicating successful practices in other areas. Ultimately, Repairs and Recycling on Wheels illustrates how sustainable public services can contribute to environmental protection, social inclusion and community well-being in a practical and measurable manner.



SEREMBAN CITY COUNCIL - MALAYSIA

SEREMBAN STREET ART

SUMMARY

The Seremban Street Art (Lorong Seni Seremban) is a 550-metre mural project initiated by the Seremban City Council (MBS) to promote arts appreciation, cultural sustainability, and tourism impact in Seremban City. The project transforms neglected back alleys of pre-war shophouses into a safe, vibrant pedestrian corridor with interactive murals, dioramas, street furniture, and lighting. Objectives include encouraging walking as a form of community engagement, improving pedestrian accessibility and comfort, reducing carbon emissions, and boosting local business revenue through increased tourism. The initiative, branded as Lorong Seni Seremban, repositions urban back lanes as public spaces and integrates cultural storytelling, 3D installations, buskers, and weekend heritage bazaars. The Malaysian Tourism Council recognised the project with a Gold Award for Tourism Promotion Event 2022. This revitalisation aligns with Seremban's ongoing evolution as a sustainable city with rich historical and cultural significance.

IN DETAIL

The Lorong Seni Seremban project represents a transformative initiative by the Seremban City Council (MBS) to integrate arts appreciation, cultural sustainability, and tourism-led urban regeneration in the heart of Seremban City. Spanning 550 metres along the back alleys of pre-war shophouses between Jalan Tuanku Munawir (Lemon Street) and Jalan Yam Tuan (Paul Street), the project redefines these historically neglected spaces as safe, walkable, and visually engaging corridors. The concept, known as Street Art Back Alley Re-Enhancement (S.A.B.A.R.), prioritises accessibility, safety, and environmental sustainability while challenging negative perceptions of alleyways as unclean or unsafe.

The transformation began with a comprehensive visioning and site assessment phase. The council evaluated the physical condition of walls, pavements, lighting, and drainage, while identifying safety concerns such as illegal dumping, crime, and poor illumination. Ownership and stakeholder involvement were addressed, with formal permissions obtained from property owners and engagement of local artists and community groups as collaborators, ensuring that the project reflected both professional and community perspectives.

Following assessment and stakeholder engagement, a detailed design concept was developed, highlighting Seremban's history, local culture, and community identity. The creative programme incorporated interactive murals, graffiti, doodles, and local satire, complemented by QR codes for digital storytelling. Three-dimensional installations, including dioramas and caricature sculptures,

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alongside street performers, buskers corners, and decorative street furniture, enhanced the visitor experience. Additional elements such as potted plants, decorative lighting, and themed pavements contributed to a cheerful, vibrant environment that encouraged walking as both recreation and cultural engagement.

Parallel to the artistic transformation, substantial infrastructure upgrades were implemented. Walls were washed, treated, and repainted with primer to ensure longevity, while open and unsanitary drainage was concealed and replaced with culturally inspired pavement. Decorative street lighting, strategically positioned bins, and informative signage improved safety, cleanliness, and pedestrian comfort. The experience was further enriched through the creation of social media-friendly photo points, interactive QR-code narratives about the murals and artists, and weekend pop-up food and heritage markets. These initiatives collectively enhanced the vibrancy of the area, attracting both local visitors and tourists.

Branding and promotion were integral to the project's success. The lane was officially named Lorong Seni Seremban, supported by a logo, signage, and a multi-platform promotional campaign that involved tourism boards, local influencers, press coverage, and mapping on Google Maps as a recognised landmark. Complementary programming included guided tours, annual mural refresh events, and art workshops for schools, colleges, and universities, embedding the project within the wider cultural and educational ecosystem. To ensure long-term sustainability, maintenance crews and local NGOs were assigned to regularly clean, repaint, and touch up installations, guaranteeing the preservation of the corridor's artistic and functional qualities.

The project also builds upon Seremban's extensive historical and cultural heritage. Formerly known as Sungei Ujong, Seremban originated in the 14th century, coming under the rule of the Sultan of Johor in 1760. It later evolved as a trade and administrative centre, particularly following the discovery of tin, coffee, gambier, and rubber in the 1870s, which attracted Arab, Malay, and Chinese immigrants. The back alleys of pre-war shophouses were central to the town's commercial activities, yet over time many fell into neglect, creating negative stereotypes about pedestrian safety and hygiene. The Lorong Seni Seremban project reconnects these historical spaces with the community, blending preservation with contemporary urban regeneration and place-making.

Today, Seremban City continues to develop rapidly across industrial, residential, transportation, and tourism sectors. The 2020 merger of Seremban and Nilai Municipal Councils into the Seremban City Council reflects the district's capacity to implement sustainable urban development strategies. The street art initiative demonstrates the council's commitment to enhancing the city's cultural identity, improving pedestrian accessibility, reducing urban carbon emissions, and generating economic value through increased visitor engagement. Through this initiative, Seremban repositions itself as a city where historical preservation, creative expression, and sustainable urban planning coexist in a vibrant, publicly accessible environment.

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SODEXO

ACHIEVING THE UN SDG 12.3 AHEAD OF DEADLINE

SUMMARY

Food waste generates up to 10% of annual global greenhouse gas emissions and costs around $1 trillion each year. Sodexo committed to halving food waste in its operations by 2025, ahead of United Nations Sustainable Development Goal 12.3. Through its Better Tomorrow 2025 Corporate Responsibility strategy and the global deployment of WasteWatch powered by Leanpath to 3,000 sites, the organisation embedded measurable food waste prevention into operations and financing.

Working with a global pharmaceutical client across APAC and EMEA, Sodexo achieved a 50% reduction in food waste in 2024, preventing 472,560kg of waste, avoiding 3,292 tonnes of CO_2 emissions and saving €1.4 million. Data-driven monitoring, employee engagement, leadership oversight and shared best practice enabled measurable progress ahead of both corporate and UN deadlines, demonstrating that sustained operational focus can deliver quantifiable environmental, social and financial outcomes.

IN DETAIL

Global population growth is expected to exceed two billion people by 2050, requiring a 65% increase in food production while significant land area and 25% of global fresh water are already used to produce food that is never consumed. Reducing food loss and waste is therefore central to ensuring sufficient food availability while limiting environmental impact. Preventing food waste is also the single most effective action available to Sodexo to cut carbon emissions and address food poverty, aligning operational delivery with SDG-guided corporate responsibility commitments established in 2017.

WasteWatch powered by Leanpath (WWxLP) functions as a customised global prevention

programme combining hardware, software and structured operational support. Food discarded at each site is weighed before disposal or donation, and employees record food type, source and reason for waste. Baselines derived from measured waste levels establish reduction targets, while real-time reporting enables stock monitoring, ordering accuracy, menu refinement, improved understanding of consumer preference and reduced waste management requirements. These insights also inform transparent discussions with on-site clients, including reassessment of free-food incentives that can increase post-consumer plate waste. Measured data supports behavioural change among both customers and production teams, extending environmental impact beyond the workplace.

Since initial rollout across 12 pharmaceutical client locations and subsequent expansion to 46 eligible sites in EMEA and APAC, governance and engagement mechanisms have underpinned delivery. Quarterly reporting to executive leadership has maintained accountability, while

training, operational resources and site-level empowerment have enabled teams to act on identified opportunities. Cross-site collaboration led by WWxLP champions has accelerated adoption of effective practices, with several locations exceeding the 50% reduction threshold.

Sustained engagement initiatives have reinforced momentum, including global WasteLESS Week activity, GOALympics performance competitions, awareness communications linked to the International Day of Awareness of Food Loss and Waste, idea-sharing through Innov'Hub, educational webinars featuring WWF and WRAP, and on-site consumer awareness events. The Autumn 2024 GOALympics competition provided the final performance improvement required to surpass the 50% reduction milestone across the account.

Overall, consistent measurement, leadership commitment, employee participation and data-led operational change enabled achievement of the food waste reduction target ahead of schedule, delivering verified environmental savings, operational efficiencies and financial value while providing a scalable model for wider organisational impact.

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THE TROPICAL WATER RESEARCH ALLIANCE

SUSTAINABLE DEVELOPMENT AND BIODIVERSITY CONSERVATION OF THE TOCANTINS-ARAGUAIA RIVER BASIN: PILOT PROJECT

SUMMARY

The project "Sustainable development and biodiversity conservation of the Tocantins-Araguaia river basin: Pilot project," coordinated by the Tropical Water Research Alliance, aimed to support the Brazilian Waters Program by promoting environmental restoration, sustainable land use, and socio-economic and digital inclusion in the Araguaia river basin. Demonstrative units integrating ecological restoration with livestock farming increased native vegetation, improved soil structure, enhanced seedling survival of Cerrado species, and raised plant biomass. Socio-economic benefits included technical training, technology transfer, digital inclusion, and local income generation. Techno-scientific outputs included published reports, new biodiversity and land-use data, and the development of replicable indices (ISAT and IQP) for environmental monitoring. The project applied climatic modelling, spatial simulations, and participatory methodologies, showing conservation is feasible alongside rural development. The model is replicable in other regions and supports the design of public policies and ecological restoration initiatives with social inclusion.

IN DETAIL

The pilot project was designed to address the needs of the Brazilian Waters Program, recognising that biodiversity protection requires attention to both terrestrial and aquatic ecosystems, with hydrological connectivity being essential to river basin health. Its principal objectives included environmental restoration, sustainable land use, and social, economic, and digital inclusion of local communities

within the Araguaia river basin, the geographic and ecological heart of Brazil.

Species distribution maps and detailed analyses of land use changes were employed to establish a scientific basis for efficient management and conservation actions. To evaluate environmental quality and improve land management, indices suitable for tropical systems (ISAT and IQP) were developed as replicable tools for adoption by public managers in other regions.

Demonstrative units (DUs) integrating ecological restoration with livestock farming were established. The approach promoted the growth of native Cerrado species through controlled grazing, reducing competition between forage plants and trees, preventing fires, and enhancing soil structure and ecosystem functionality. These units led to increased native vegetation cover, improved survival of seedlings, and greater plant biomass across grazed and ungrazed areas.

Socio-economic outcomes included technology transfer, access to technical training, digital inclusion, and income generation through local employment and sustainable practices, strengthening community participation. Techno-scientific outputs included unprecedented biodiversity and land-use data, technical reports, and tools supporting public policy. Climatic modelling and spatial simulation were applied to identify priority conservation areas, while participatory methodologies ensured local engagement and cooperation between scientific institutions, communities, and governmental bodies.

The pilot demonstrated that ecological restoration can coexist with productive rural systems. Its holistic and replicable model serves as a reference for river basin management and public policy development in Brazil and internationally. Despite the conclusion of Banco Itaú funding, the DUs remain operational, and TWRA continues long-term initiatives such as “Araguaia Vivo 2030” and a Future Earth–funded soil and water management study, focusing on integrated monitoring, sustainable community practices, and economic modelling to guide environmental decision-making. These ongoing programmes maintain a multi-stakeholder approach to ecosystem conservation and rural development, ensuring benefits for both local communities and the broader Araguaia river basin.

WORKMAN RETAIL & LEISURE

FEED THE WORMS AND BUG HOTEL

SUMMARY

The Touchwood Sustainability team works to improve environmental performance annually through projects and strict adherence to environmental and energy standards. The latest initiatives support minibeast and insect reproduction, enhance external green gardens, reduce food waste, and create a natural cycle of life. Key actions included installing a large bespoke bug hotel and a Worm City composting facility, generating nutrient-rich fertiliser for plants and supporting pollination, hive growth, and honey production. The team implemented a summer planting scheme featuring Rudbeckia, Echinacea, Skimmia Japonica, Lavendula Hidcote, Rosemary, and Allium Globemasters to increase pollen rates and attract insects. Honey from rooftop beehives is harvested, jarred, and used in educational outreach to local schools. Projects cost under £5,000 and engage stakeholders including tenants, staff, and the wider community. Work contributes to Green School Awards, reduces waste charges, and strengthens biodiversity awareness. The Centre retains ISO 14001 and ISO 50001 certification.

IN DETAIL

Touchwood's sustainability projects are designed to improve environmental performance year on year through practical interventions and compliance with leading environmental and energy standards. The most recent initiatives aim to support reproduction of minibeasts and insects including ladybirds, spiders, woodlice, bees, and the Centre's Buckfast

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beehives, while transforming external green gardens into vibrant, attractive spaces and reducing food waste produced by the Centre Management team. Progress and learnings are shared with local organisations such as schools and colleges, as well as stakeholders including residents, investors, other Workman sites, tenants, and Centre employees. Achieving recognition such as a Green Apple award would highlight the team's work and support ongoing improvements.

Biodiversity protection was enhanced with the introduction of a large bespoke bug hotel in external green spaces, offering shelter, egg-laying, and refuge from predators. A Worm City composting facility was installed on the rooftop service deck near the management suite, processing food waste from approximately 60 Centre team employees and coffee grounds from onsite coffee shops. Organic matter is broken down by worms, producing nutrient-rich castings used as fertiliser for external planting. This natural fertiliser supports growth of plants chosen for insect attraction qualities, increasing pollen availability and aiding bee pollination, hive growth, and honey production.

Summer planting schemes included Rudbeckia, Echinacea, Skimmia Japonica, Lavendula Hidcote, Rosemary, and Allium Globemasters. The bug hotel was designed with eye-catching Touchwood lettering to attract attention and encourage engagement. Installation took approximately one week following a two-week construction period. Honey harvested from rooftop beehives is potted in branded jars for promotional events and as prizes for local schools, raising awareness of sustainability aims.

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These initiatives are part of the Green School Awards programme, sponsored by the Centre, which challenges schools in the borough to improve environmental performance. The total project cost was under £5,000, supported by sustainability stakeholders including landlords, tenants, and the Facilities Management partner. Tenants benefit from reduced waste charges and improved waste handling, visitors enjoy enhanced green spaces, and staff and local schoolchildren gain insight into ecosystems, the role of shopping centres in environmental stewardship, and methods to improve eco-friendliness at schools and home.

Long-term plans include additional composting units to handle restaurant food waste more efficiently and expanded rooftop planting to further support biodiversity and waste reduction. The project demonstrates an innovative cycle linking waste reduction with external garden enhancement, transferable to business and home settings. Centre staff have gained understanding of the importance of biodiversity, ecosystem services, human health, environmental regulation, and economic benefit. In May 2025, the Centre retained Certificates of Conformity to ISO 14001 and ISO 50001, confirming ongoing adherence to environmental and energy management standards.

This work of reference gathers environmental projects into a clear, accessible resource. Each entry outlines aims, processes, and outcomes, showing how ideas become real world action. Useful for consultation or study, it provides a broad perspective on environmental initiatives and their practical impact

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