

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



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Research & Innovation



Stimulating Circular Economy through Sustainable Biotechnology

PolyU start-up JAPJAP Zero Waste has developed the JAPJAP Machine, a modular food waste pre-treatment system integrating Internet of Things technology with black soldier fly-based biological recycling. Designed for flexibility and ease of use, the system supports various scenarios, including schools, businesses, and community facilities, while reducing operational costs. The JAPJAP Box, a compact intelligent recycling unit, enables real-time monitoring and control of the treatment process, making it efficient and reliable even in space-constrained environments. By leveraging black soldier flies in a modular stacking system using upcycled pallets, the machine significantly reduces food waste, providing an environmentally friendly alternative to traditional landfill disposal.

The innovative design and eco-friendly impact of JAPJAP have been recognised with multiple awards, including the **Gold Prize at the HK Techathon+**

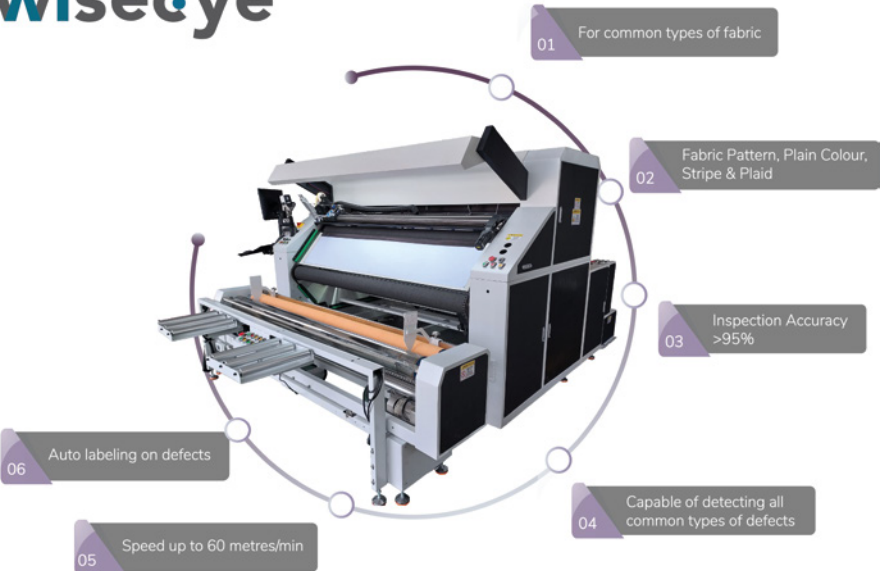
(Category – Sustainability & ESG), the **Grand Prize at the Asia Social Innovation Award**, and the **InnoTech N-Generation Award**. Supported by the Recycling Fund, the system offers on-site food waste processing and resource recovery, transforming organic waste into valuable byproducts, such as fertiliser and protein, and fostering a circular economy. This decentralised approach mitigates carbon dioxide emissions and decreases reliance on landfills, promoting sustainable urban and industrial waste management.

Optimising Textile Manufacturing with Automated Inspection

The global textile and apparel industries have long relied on human visual inspection for quality control, a process that is time-consuming, inconsistent, and prone to errors. WiseEye, a standalone AI-based system developed by the School of Fashion and Textiles, addresses these challenges by automatically detecting, classifying, and grading defects in woven, knitted, and non-woven textile materials. Designed for high-speed inspection environments, it provides instant, accurate results, reducing the dependence on highly skilled quality inspectors.

Being awarded the **Silver Medal at the 49th International Exhibition of Inventions Geneva**, WiseEye also minimises downstream wastage by identifying defects early in the production process, ensuring that defective textiles are promptly addressed. This innovation supports manufacturers in maintaining consistent quality standards, improving operational efficiency, and fostering sustainable production practices within the textile sector.

wisecye



Teaching & Learning

Co-Creating a Greener Future with Young Nepalis

The EAGLE Global Youth Leadership Programme, a year-long initiative co-organised by the Student Affairs Office, World Vision, and a local social enterprise, Dundum Solutions, arranged leadership and social innovation workshops, camps, and hands-on engagement for students to cultivate global citizenship, ethical leadership, and a strong sense of social responsibility. A key feature of the programme was EAGLE the Adventurers, in which PolyU students embarked on an expedition to Kathmandu, Nepal to collaborate with local youths to co-create impactful community projects aligned with the UN Sustainable Development Goals. Guided by design thinking and leadership training, students proposed practical, sustainable solutions to local challenges using readily available resources.

Moreover, through Poly Free TaRUN, a project designed to address the lack of waste separation at Tarun School, designated recycling bins and an incentive scheme were introduced with the support from local recycling social enterprises. Such an initiative not only improved the Nepalese campus environment but also heightened awareness of recycling practices among local students. Through this transformative cross-cultural programme, students were able to broaden their global outlook, empathy, and problem-solving abilities. It also demonstrated the powerful role of student-led innovation in fostering sustainable community impact and driving positive, actionable societal change based on environmental, social, and governance values.



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External Engagement

Innovative Waste Solutions for Sustainable and Circular Construction Practices

In collaboration with the International Society for the Environmental and Technical Implications of Construction with Alternative Materials, PolyU hosted the "11th International Conference on the Environmental and Technical Implications of Construction with Alternative Materials" with the theme "Innovative Valorisation of Alternative Materials and Waste towards Circular Construction".

Featuring over 160 paper presentations and insightful keynote speeches from global experts, the Conference brought together **around 300 participants** from academia, industry, and the public sector from around the world. These scholars, researchers, and practitioners engaged in discussions centred on innovative technologies and practices for converting waste and industrial by-products into sustainable construction materials.

Technical visits were arranged to Y-PARK, WEEE-PARK, T-PARK, and CIC iHub. These provided participants with first-hand insights into advanced recycling and waste-to-energy processes, as well as construction innovation. Through knowledge exchange and cross-sector collaboration, it is hoped that emerging technologies and innovative methods can contribute to the advancement of circular construction practices.



External Engagement

Championing Sustainability in the Global Fashion Industry

PolyU demonstrated its leadership in sustainable fashion with a high-impact global debut in Paris through its collaboration with the esteemed AELIS Couture and an international exhibition showcase.

The collaboration with the French fashion house featured groundbreaking sustainable textiles developed by the School of Fashion and Textiles (SFT). These innovative textiles, using a waterless metallising technology to embed nanoscale metal films onto silk organza, inject environmental responsibility into elegance. The resulting gold and silver-coated fabrics offer a luxurious aesthetic with comfort and flexibility, while producing no chemical or water waste, signalling a powerful and full-of-potential fusion of technology, design, and sustainability.

Meanwhile, the Flying High exhibition in Paris clearly signalled PolyU's strong presence in the global fashion industry. The ten interdisciplinary projects under the themes of "Style in Motion" and "Sustainability in Innovation" included innovations such as vegan antiviral leather, textiles made from waste for use in construction, interactive



Lecture Series on Sustainable Fashion Technology

optical-fibre fabrics, and sputtering-coated pollution-free fashion materials.

To showcase the University's commitment to impactful research and sustainable development, SFT also held a "Lecture Series on Sustainable Fashion Technology" to introduce attendees to pioneering concepts and real-world applications such as edible vitamin-based functional fibres and emerging sustainable fashion technologies, which help push boundaries across science, materials, and fashion, driving eco-conscious transformation in the global fashion landscape.



Flying High exhibition in Paris

Governance & Operations

Encouraging Eco-Friendly Habits and Waste Reduction on Campus

PolyU continues to nurture awareness and active participation in sustainable living among staff and students through flagship programmes like the GreenCoin initiative. This programme incentivises eco-friendly habits such as recycling disposable beverage containers and adopting reusable bags, rewarding participants with virtual coins redeemable for coupons and on-campus services. With **over 7,000 users** and **more than 300,000 recyclable items collected**, GreenCoin has become a vital driver of positive behavioural change.

To further these goals, reusable lunchbox rental and return machines have significantly cut down single-use disposable food containers on campus, alongside with signature campaigns including Low Carbon Dining Week, Campus Sustainability Week, and Urban Farming. The University's dedication to

sustainable waste management has achieved **Excellent Level in the WastewiSe Certificate under the Hong Kong Green Organisation Certification scheme**, reflecting its leadership in environmental stewardship.

With a view to further encourage green practices, the University offers a promotional wheat straw reusable cutlery set redeemable with GreenCoins, supporting efforts of the Government of the HKSAR to reduce disposable plastic products and empowering the community to cut plastic use. Additionally, the comprehensive Green Map provides an interactive guide for staff and students to sustainable features on campus, including recycling points, farming sites, and catering outlets offering "Bring Your Own" discounts, fostering engagement and making sustainable choices more accessible.

Reduction of municipal solid waste disposal to landfill (tonnes):



250+

Recycling volume at Reverse Vending Machine (RVM):



347,400+
(increased 41%, compared to 2022/23)

