SDG 9

INDUSTRY, INNOVATION AND INFRASTRUCTURE

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UM's Contribution to SDG 9 in 2025

The Universiti Malaya (UM) contributes to SDG 9 by turning research into enterprise, partnering with industry and building the infrastructure that innovation needs. This chapter reports UM's 2025 performance against the four SDG 9 indicators of the THE Sustainability Impact Ratings 2027: research on industry, innovation and infrastructure; patents citing UM research; university spin-offs; and research income from industry and commerce.

In 2025 UM brought its industry relations, technology transfer and prototyping units together in a single department, JPIPP, and continued to grow its venture pipeline through the UM Deep Tech accelerator, the UM Commercialization Bridging Grant and equity crowdfunding with pitchIN. Its established spin-offs, from Xcess Pressure in clean energy to BioApps in medical technology, keep UM intellectual property in productive use. New agreements with China State Construction Engineering (Hong Kong), Global Turbine Asia, COWAY and KAO Malaysia extended company-funded research, while UM UG i-Fest, Makerspace@UM, KIK 2025 and UMRIIS 2025 carried a culture of innovation from students and staff to industry partners.



A Single Gateway for Industry and Innovation

In May 2025 UM introduced the Innovation & Research Commercialization Management Department (Jabatan Pengurusan Inovasi dan Pengkomersialan Penyelidikan, JPIPP) under the Office of the Deputy Vice-Chancellor (Research & Innovation). JPIPP brings together three units that previously worked side by side: the UM Centre of Industry Relations (UMCIR), which is the University's first point of contact for companies and manages its industry agreements; the UM Centre of Innovation and Enterprise (UMCIE), UM's technology transfer office, which handles intellectual property, licensing and venture building; and the Technology Innovation Centre (Makerspace@UM), which provides prototyping and digital-fabrication facilities. A company seeking a research partner, or a researcher with an idea ready for market, now deals with one department rather than three.

The University's commercial arm completes this structure. UM Innovations Sdn Bhd (UMI), a wholly owned subsidiary of UM Holdings Sdn Bhd, forms and holds equity in UM spin-off companies and supports 27 business pods and incubatees in engineering, education, medical technology, artificial intelligence and the life sciences. JPIPP also connects UM to national innovation policy. In June 2025 UM contributed to MRANTI's SUPER Innovation Pillar workshop (12 June) and to the Ministry of Science, Technology and Innovation's review of the National IP and Innovation Commercialisation Policy (18 June), and in February it joined the national committee of deputy vice-chancellors for industry and community networks at Universiti Utara Malaysia.

UM Deep Tech: Turning Laboratory Research into Companies

UM's main route from discovery to enterprise is the UM Deep Tech (UMDT) accelerator, a six-month programme run by UMCIE that takes proof-of-concept research to validated, investor-ready prototypes. Researchers are paired with business co-founders and supported through grants, 24 weekend classes, market-validation exercises and mentoring, with backing from Yayasan Bank Rakyat, Youth Venture, AWS, FingerPrint for Success, UMVCC and UMI.

The third cohort ended in January 2025 with the UMDT Startup Demo Day at the Research Management & Innovation Complex (RMIC). Ten startups presented to about 125 investors, funders, corporate leaders, researchers and students. Their technologies ranged from AI-powered fetal monitoring (NeoGuard) and platelet-derived therapy for osteoarthritis (MBIOH) to automated solar-panel cleaning (UMTechvis), plastic-to-fuel conversion (LiquePro) and nanographene carbon dots (Malphene). Three of them — Qubios, Zephyron and BiofusionPlus — received investment term sheets from Origgin Ventures, Singapore.



Figure 1. Startups presenting prototypes to investors and industry at the UM Deep Tech Startup Demo Day, Research Management & Innovation Complex, January 2025. Source: UM news; photo: Corporate Communications Centre, UM

The pipeline continued through the year. On 21 April 2025 UMCIE launched the fourth cohort with a Co-Founder Search Day that matched 14 research-based ventures with business leaders. On 18–19 October 2025 UMCIE and GrowthCharger ran the UM Deep Tech Challenge, a two-day hackathon at the KPPI Building in which student teams moved from ideation to rapid prototyping; ten finalists were selected from dozens of teams. The UM Deep Tech Innovation Competition final was then held at UMRIIS 2025, where outstanding student innovators received cash prizes, mentorship and post-competition support to bring their ideas closer to market. Because THE counts spin-offs only from their third year, these 2025 ventures will add to UM's spin-off count from 2027 onwards.



Figure 2. Participants of the UM Deep Tech Challenge hackathon, organised by UMCIE with GrowthCharger, KPPI Building, Universiti Malaya, 18–19 October 2025. Source: UMCIE and GrowthCharger.

Financing UM Ventures

Promising technologies often stall between the laboratory and the market. UM addresses this gap through the UM Commercialization Bridging Grant (UM-CBG), which provides up to RM500,000 per project over 12 months to raise the technology readiness of products developed by UM researchers, UMDT alumni and UM spin-offs. Recipients must build on UM research or intellectual property and form a company if they have not already done so, which ensures that the grant produces ventures rather than further prototypes.

Beyond University funding, UMI's partnership with the equity-crowdfunding platform pitchIN gives UM startups access to public investment and a structured fundraising accelerator. UM also brought investors to campus during the year: Quest Ventures visited on 18 June 2025 and Breakthrough Energy, the climate-technology initiative founded by Bill Gates, held an introductory session on 25 June 2025. Both met UM startups to explore investment and collaboration.

UM's Spin-off Portfolio

UM's spin-offs are registered companies that exploit intellectual property created at the University. Some are majority-owned through UM Innovations Sdn Bhd; others operate independently under licence agreements with UMCIE. UM Holdings reported 16 portfolio spin-off companies built on licensed UM technologies in its Annual Report 2021, and in line with THE's definition UM counts for 2025 only those established between 1 January 2000 and 31 December 2022 that remained active during the year. The portfolio shows how UM research has moved into sectors that matter to Malaysia's industrial future.

Spin-off	UM technology commercialised	Sector
Xcess Pressure Sdn Bhd	In-pipe micro-hydropower recovering energy from excess pressure in water mains, piloted with Air Selangor	Clean energy
Essentinutrien Sdn Bhd	Health supplements from tiger milk mushroom (*Lignosus rhinocerus*)	Life sciences
eProfiler Solution	Portable, chemistry-free diagnostic profiling	Medical technology
Fylix	AI solutions from the Faculty of Computer Science and Information Technology	Artificial intelligence

Xcess Pressure illustrates the model at its clearest. Its in-pipe turbine, developed from UM engineering research, recovers energy that water utilities would otherwise dissipate through pressure-reducing valves, and its pilot with Air Selangor has taken the technology from the laboratory into a working water network. Essentinutrien and eProfiler carry UM research in natural products and diagnostics into the health market, while Fylix applies the University's computer-science expertise to commercial AI solutions. Each company keeps UM intellectual property in productive use and creates skilled employment outside the University.

A Mature Portfolio of UM Spin-off Companies

THE counts spin-offs that were established at least three years before the data year and are still active. For 2025, this means companies founded between 1 January 2000 and 31 December 2022. UM's Sustainability Report 2023 documented ten registered spin-off companies that were already operating and commercialising UM research that year. These companies came from research centres such as the Centre of Printable Electronics, the Nanotechnology and Catalysis Research Centre (NANOCAT) and the Faculty of Medicine's Medicinal Mushroom Research Group. UM Innovations Sdn Bhd (UMI), the University's commercialisation arm, supports UM's spin-off companies.

The portfolio spans the sectors that matter most to Malaysia's industrial future. In healthcare and medical technology, Bioapps Sdn Bhd uses digital manufacturing to produce custom-fitted prosthetic and orthopaedic devices. Biosight Sdn Bhd developed an IoT-based scoliosis assessment system that lets clinicians monitor patients remotely. UMCH Technology Sdn Bhd makes personal health and wellness monitoring technology, and Uniresearch Innovation Sdn Bhd developed an electrochemical device for rapid detection of foodborne bacteria. In natural products, Essenti Nutrien Sdn Bhd makes health supplements from the Tiger Milk Mushroom, and Oleofarma Sdn Bhd produces natural-based creams for pharmaceutical and cosmetic use. In clean energy, Xcess Pressure Sdn Bhd generates electricity from excess pressure in water pipelines, and Van Coating Sdn Bhd develops coatings that improve the efficiency and durability of solar panels. In advanced materials and digital technology, Flexilicate Sdn Bhd produces precision capillary tubes for medical diagnostics and multi-bore optical fibres for high-speed data transmission, and Fylix Sdn Bhd builds AI chatbots for customer service across many sectors.

UM's later reports show that these companies continued to trade and grow after 2023. The Sustainability Report 2024 recorded Xcess Pressure Sdn Bhd taking its in-pipe hydropower technology to industrial testing. Representatives of the Ministry of Energy Transition and Water Transformation (PETRA), the National Water Services Commission (SPAN), Pengurusan Aset Air Berhad (PAAB) and Air Selangor witnessed the tests, and a pilot prototype was installed in a working water network. The same report described Essentinutrien Sdn Bhd's Tiger Milk Mushroom supplements. The company also trains rural cultivators and builds inclusive supply chains. Both companies continue to feature in UM's 2025 SDG 9 reporting.

Behind this established portfolio, a new generation of ventures is moving through UM's pipeline. The Sustainability Report 2024 featured start-ups from the UM Deep Tech accelerator, including Musculoskeletal BioHeal, CARE Passport App, NeoGuard, UMTechVis, Zephyron, Qubios, eProfiler, Biofusion+ and Malphene. These ventures were formed after 2022, so they do not yet count towards THE's spin-off indicator. They will add to UM's count as they reach three years of operation from 2027 onwards.

Independent Evidence of an Established Spin-off Portfolio

Sources outside UM's sustainability reports confirm that the University's spin-offs were established well before THE's cut-off of 31 December 2022. UM manages its spin-offs through UM Holdings Sdn Bhd and its subsidiaries UM Innovations Sdn Bhd and UM Capital Berhad. The UM Holdings Annual Report 2021 recorded 16 portfolio spin-off companies "driven by licensed UM technologies" in life sciences and medical technology, IoT, engineering and materials, and agriculture and sustainable technology, drawing on a portfolio of 639 patents and 1,823 copyrights. The report noted that BioApps Sdn Bhd and UMCH Technology Sdn Bhd had won more than RM3 million in National Technology and Innovation Sandbox grants from MOSTI, and that Fylix Sdn Bhd was serving clients including MAMPU, the Ministry of Higher Education, Petronas and Perodua.

The UM Centre of Innovation and Enterprise (UMCIE) also publishes the track record of UM's longest-standing spin-offs. BioApps Sdn Bhd generated more than RM2.5 million in revenue in 2018, and UMCH Technology, Oleopharma and CBMTI each earned revenue from UM technology that year. BioApps was spun out of the Faculty of Engineering's Centre for Applied Biomechanics in early 2015 and has run the prosthetic and orthotic service at the Universiti Malaya Medical Centre since January 2015.



Figure 3. UM Holdings' intellectual capital in 2021: 24 business pods, 16 portfolio spin-off companies, 639 patents, 1,823 copyrights and 8 trade secrets, with highlights of BioApps, UMCH Technology, Uniresearch & Innovation, Essentinutrien and Fylix. Source: UM Holdings Sdn Bhd, Annual Report 2021, p. 37 (ebook.um.edu.my/UMHolding/annual-report).

Xcess Pressure: A Spin-off Built on UM Intellectual Property

Xcess Pressure Sdn Bhd shows how a UM spin-off exploits the University's intellectual property, the core of THE's definition of a spin-off. Its founder, Dr Iswadi Jauhari, developed the Super Butterfly in-pipe hydropower system while researching hydropower at UM; the system converts excess pressure normally wasted at pressure-reducing valves in water mains into clean electricity. The company's investor profile on pitchIN, the equity crowdfunding platform that partners with UM Innovations, sets out its licence agreement with UM: intellectual property derived from the licensed UM technology is jointly owned by UM (30%) and Xcess Pressure (70%). Its pilot system at an Air Selangor site has a potential output of more than 50 kW, about 420,000 kWh a year, enough for around 50 homes, and saves about 320 tonnes of carbon dioxide.



Figure 4. Intellectual property clause of the licence agreement between Universiti Malaya and Xcess Pressure Sdn Bhd (XPSB): IP derived from the licensed technology is jointly owned, 30% by UM and 70% by XPSB. Source: Xcess Pressure investor profile, pitchIN (pitchin.my/equity/xcess-pressure).



Figure 5. Xcess Pressure's Super Butterfly pilot project at an Air Selangor site: potential power above 50 kW (about 50 homes, 420,000 kWh a year) and a saving of about 320 tonnes of CO_2. Source: Xcess Pressure investor profile, pitchIN (pitchin.my/equity/xcess-pressure).

Strategic Industry Partnerships

UM's industry agreements in 2025 spanned construction, aerospace, data centres, renewable energy and consumer technology. The most significant was a five-year memorandum of understanding with China State Construction Engineering (Hong Kong) Ltd (CSHK), signed on 12 June 2025 at the Legislative Council Complex in Hong Kong during a UM delegation's official visit from 10 to 12 June. The agreement covers joint research and innovation in construction and green technology, student development and technical exchange, and gives UM researchers access to one of the region's largest construction firms and its innovation facilities.



Figure 6. UM delegation's official visit to China State Construction Engineering (Hong Kong) Ltd, culminating in a five-year MoU on joint research, innovation and technical exchange, Hong Kong, 10–12 June 2025. Source: UMResearch.

Other agreements extended UM's reach into high-technology sectors. On 21 February 2025 UM signed a memorandum of understanding and non-disclosure agreement with Basis Bay Information Solutions to develop a data-centre foundation course and renewable-energy solutions for data centres. On 21 May 2025, at the Langkawi International Maritime and Aerospace Exhibition (LIMA 2025), UM formalised a strategic partnership with Global Turbine Asia in aerospace engineering and education. UM also signed agreements with COWAY Malaysia and SpeeQual, and on 30 June 2025 concluded a memorandum of agreement with Sacoor Group Malaysia worth RM150,000 for student awards and placements from 2025 to 2028.

Dialogue with industry and government complemented these agreements. UM met the Malaysian Investment Development Authority (MIDA) on 29 May 2025 to explore research and investment collaboration, took part in the Airbus–MIGHT outreach on sustainable aviation on 10 April, introduced its UM-INCO joint research programme to China Communications Construction Company and the China Enterprises Chamber of Commerce in Malaysia on 21 February, and hosted the MICCI–UM Post-Budget 2026 Forum (6 November) and the ASEAN E-Commerce Conference 2025 (24 November).

Research Income from Industry and Commerce

Each of these partnerships is a route to company-funded research. UM reports to THE only income received in 2025 directly from industrial and commercial organisations for research, following the Frascati Manual definition. Consultancy fees, royalties and licence income, donations and sponsorships such as the Sacoor Group award, government grants and income from UM's own companies are excluded, as THE requires. The income is reported by broad subject area and scaled by the academic staff in each area.

Industry-funded research at UM is concentrated in three areas that match the partnerships described above. In science, technology and engineering, companies commission work on energy systems, green construction, data-centre efficiency and advanced materials. In medicine and health, the Universiti Malaya Medical Centre and the Faculty of Medicine conduct contract research and industry-sponsored clinical studies with pharmaceutical and medical-technology firms. In the social sciences and business, industry bodies such as MICCI work with UM economists and policy researchers on economic and trade questions. JPIPP manages the contracts for all three areas, while the Bursary records the income received, ensuring that the figures UM submits to THE are verified, traceable to signed research agreements and limited to research income in the strict sense.

A Sustained Record of Industry-Funded Research

THE measures research income received directly from industry and commerce, scaled by the number of academic staff in each subject area. UM's Sustainability Report 2023 published this measure for 2020 to 2023 using data from the Office of Research Management and Innovation. The figures are adjusted for purchasing power parity and expressed per academic staff member.

In 2020, UM's overall research income from industry and commerce reached a peak of 29,240 per academic staff member. STEM led at 36,222, followed by Medicine at 25,464 and Arts and Humanities and Social Sciences at 11,951. Income fell during the pandemic years, to 13,600 in 2021 and 7,603 in 2022. It then recovered strongly to 15,573 in 2023, more than double the 2022 level. The recovery was broad: STEM reached 18,002, Medicine 18,331, and Arts and Humanities and Social Sciences 11,246, its highest level since 2020. This record shows that industry funds UM research in all three subject areas THE measures, not only in science and engineering.

Company-Funded Research Contracts in 2025

Companies continued to fund research by UM academics in 2025, the income THE counts under indicator 9.4. On 5 May 2025, UM and COWAY (Malaysia) Sdn Bhd signed a memorandum of agreement for a 12-month research project, “Study on Insect Repellent Gel Incorporated with Essential Oils”, to develop a safe and effective repellent gel against household pests and assess its potential for local production. Repellency and cytotoxicity testing is carried out at the Tropical Infectious Diseases Research and Education Centre (TIDREC), and degradation analysis at the Centre for Foundation Studies in Science (PASUM).

In September 2025, KAO Malaysia signed its first academic partnership in Malaysia with UM, contributing RM50,000 through its Bioré brand. Part of this funds a Faculty of Science research project, “Innovative Clean Skincare Formulations for Skin Protection and Healthy Living”; the rest supports a UMCares community programme and is not counted as research income. UM also signed agreements that open new routes to company-funded research: a two-year memorandum of understanding with Global Turbine Asia Sdn Bhd on aerospace research and technology transfer at LIMA 2025 on 21 May, and a memorandum of understanding with Clinical Research Malaysia and the Centre for Affordable Diagnostics and Therapeutics on 23 May for clinical research on affordable healthcare.



Figure 7. MoA signing between UM and COWAY (Malaysia) Sdn Bhd for the research project on insect repellent gel, PASUM, 5 May 2025. Source: IndustriVersity@UM e-Newsletter, Vol. 2, Issue 6 (2025), p. 7, JPIPP.



Figure 8. MoU between UM and Global Turbine Asia Sdn Bhd on aerospace research and technology transfer, LIMA 2025, Langkawi, 21 May 2025. Source: IndustriVersity@UM e-Newsletter, Vol. 2, Issue 6 (2025), p. 3, JPIPP.

UM UG i-Fest 2025: Malaysia's First Undergraduate Ideas Festival

Innovation at UM begins with its students. From 24 to 26 June 2025 the University held the inaugural UM Undergraduate Ideas Festival (UM UG i-Fest 2025) at Dewan Tunku Canselor — the first festival of its kind in Malaysia. It brought together more than 2,600 undergraduate projects from across the Social Sciences, Science and Technology, and Health Sciences, presented through research talks and exhibition booths to peers, academics, industry representatives and visitors.

The festival gave students direct exposure to industry evaluators and partners. It was held alongside the Industry Pay It Forward (iPIF) career programme and included Makerspace@UM prototyping demonstrations and robotics workshops with Autobotic Sdn Bhd. By treating final-year projects as ideas worth presenting to industry, i-Fest helps students build the communication, critical-thinking and presentation skills that innovation careers demand.



Figure 9. Participants, organisers and exhibitors at UM UG i-Fest 2025, Malaysia's first undergraduate ideas festival, Dewan Tunku Canselor, 24–26 June 2025. Source: UM Sustainability Report 2025; photos: Corporate Communications Centre, UM.

Makerspace@UM: Infrastructure for Making

Makerspace@UM provides the physical infrastructure that turns ideas into prototypes. Its laser cutters, 3D printers and electronics and IoT workstations are open to staff, students and the public, and its programmes in 2025 reached well beyond the campus. The Makers Club robotics competition, Maze Craze, brought 80 students together from 21 to 24 April to build and programme maze-solving robots, and on 29 May UM hosted Malaysia Makers Meet 2025 with STEM 4 All Makerspace and Cytron Technologies, a national gathering on makerspaces and digital fabrication in education.

The facility also serves as a bridge to schools. In 2025 it welcomed students from Integrated Islamic School Shah Alam (14 and 24 April), SMK Sri Kiambang in Kelantan (40 students and 5 teachers, 25 April) and SMK Tok Perdana in Sitiawan (40 students and 5 teachers, 26 June), introducing them to laser cutting, IoT and 3D design. With Autobotic Sdn Bhd, Makerspace@UM also ran robotics and STEM sessions for children at Shelter After School on 18 April and 20 June 2025.

KIK 2025 Fosters a Culture of Innovation and Creativity

Innovation at UM is not limited to research laboratories. The Universiti Malaya Kumpulan Inovatif dan Kreatif (KIK) Convention 2025 brought together more than 100 innovation projects from responsibility centres across UM and the Universiti Malaya Medical Centre, of which 30 outstanding projects were selected to advance to the next phase. Guided by UM's P.O.I.S.E. values — Passion, Oneness, Integrity, Sincerity and Empathy — KIK encourages staff to generate creative ideas that improve service quality and solve operational problems, extending the culture of innovation to every part of the University.



Figure 10. Staff innovation projects on display at the Universiti Malaya Kumpulan Inovatif dan Kreatif (KIK) Convention 2025. Source: UM Sustainability Report 2025; photo: Corporate Communications Centre, UM.

Responsible Innovation: AI Governance and Intellectual Property

As digital technologies reshape research and teaching, UM has strengthened the governance that keeps innovation responsible. In 2025 the University completed the Universiti Malaya Academic Policy for Artificial Intelligence, which provides an institutional framework for the ethical use of AI in academic activities while safeguarding academic integrity. The policy was soft-launched at the Senate meeting on 20 November 2025 by the Vice-Chancellor and is read together with the Universiti Malaya Guidelines for the Use of Ethical Artificial Intelligence, updated in 2025.

UM also builds researchers' capacity to protect and transfer their inventions, which in turn supports the patent citations THE measures under indicator 9.2. On 28 April 2025 UMCIE ran a hands-on intellectual-property workshop at the Faculty of Science for holders of the Fundamental Research Grant Scheme, covering how to identify, document and file inventions. Throughout the year UMCIE also promoted UM technologies for licensing, including CranioMax, an AI-powered three-dimensional skull-growth predictor, and a rapid aptamer biosensor that detects Acinetobacter baumannii in under three hours.

UMRIIS 2025 Showcases Innovation, Research Excellence and Industry Collaboration

From 22 to 23 October 2025, Dewan Tunku Canselor hosted the Universiti Malaya Research, Innovation and Industry Summit 2025 (UMRIIS 2025). Themed "Inspiring Research, Advancing Collaboration, Transforming Impact", the summit brought together more than 2,000 participants from academia, industry, government and non-governmental organisations, and featured more than 1,000 transdisciplinary research posters and presentations. Officiating the opening, the Deputy Vice-Chancellor (Research & Innovation), Professor Ir. Dr. Kaharudin Dimyati, described the summit as a platform where ideas meet opportunity, and where UM turns research into practical solutions for society, industry and the nation.

The programme was designed around industry engagement. Keynote sessions addressed semiconductors and energy, fireside chats brought together industry and research leaders, and a Business Matching Day on Health and MedTech connected UM researchers directly with companies. The summit closed with the UM Deep Tech Innovation Competition final and awards ceremony, at which the Deputy Secretary-General (Management and Development) of the Ministry of Higher Education recognised the winning student innovators. UMRIIS 2025 gave UM a single annual stage on which to present its research to the partners best placed to use it.







Figure 11. Researchers, industry and government visitors at the Universiti Malaya Research, Innovation and Industry Summit 2025 (UMRIIS 2025), Dewan Tunku Canselor, 22–23 October 2025. Source: UM Sustainability Report 2025; photos: Corporate Communications Centre, UM.

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