



EARTO INNOVATION AWARDS 2025

Technology for a better world

www.earto.eu



EARTO - European Association of Research and Technology Organisations

Founded in 1999, EARTO promotes RTOs and represents their interest in Europe. EARTO network counts over 350 RTOs in more than 32 countries. EARTO members represent 228,000 highly-skilled researchers and engineers managing a wide range of innovation infrastructures.

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EU RD&I PROGRAMMES
GLOBAL CHALLENGES
EUROPE'S
INDUSTRIAL COMPETITIVENESS
EUROPEAN RESEARCH AREA

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EARTO INNOVATION AWARDS 2025

From the lab to your everyday life. RTOs innovate to improve your health and well-being, your safety and security, your mobility and connectivity. RTOs' technologies cover all scientific fields. Their work ranges from basic research to new products and services' development. RTOs are non-profit organisations whose core mission is to produce, combine and bridge various types of knowledge, skills and infrastructures to deliver a range of research and development activities in collaboration with public and industrial partners of all sizes. These activities aim to result in technological and social innovations and system solutions that contribute to and mutually reinforce their economic, societal and policy impacts.

IMPACT DELIVERED

For this category, the rewarded innovations (product or services) have social and/or economic relevance, innovative originality, are today on the market and have proven their impact.

IMPACT EXPECTED

For this category, the rewarded innovations (product or services) have social and/or economic relevance, innovative originality, are not yet on the market as a final product/service but promise to have a great impact.

THE AWARD COMPETITION IS ADJUDICATED BY AN INDEPENDENT JURY



Christian Ehler
Member of the
European Parliament



Georg List
Vice President of Corporate
Strategy, AVL List GmbH &
WG R&I Chair,
BusinessEurope



Elisa Rivera
General Director of Planning,
Coordination & Knowledge
Transfer, Ministry of Science
and Innovation of Spain



Michiel Scheffer
President of the Board of
the European Innovation
Council

17 EARTO
INNOVATION
AWARDS
YEARS

**NUMBER
OF APPLICATIONS
SO FAR**

61
RTOs

428
APPLICATIONS

19
COUNTRIES

**NUMBER
OF WINNERS
SO FAR**

23
COUNTRIES

22
RTOs

81
WINNERS

IMPACT **DELIVERED**

Discover
more innovations
from RTOs

1ST

CEA is a French RTO, ranked as the world's most innovative research organisation (Clarivate 2025). Its institute CEA-Leti is a global leader in microelectronics and nanotechnologies.

Revolutionising Vibration Sensing: Wormsensing's Dragonfly®

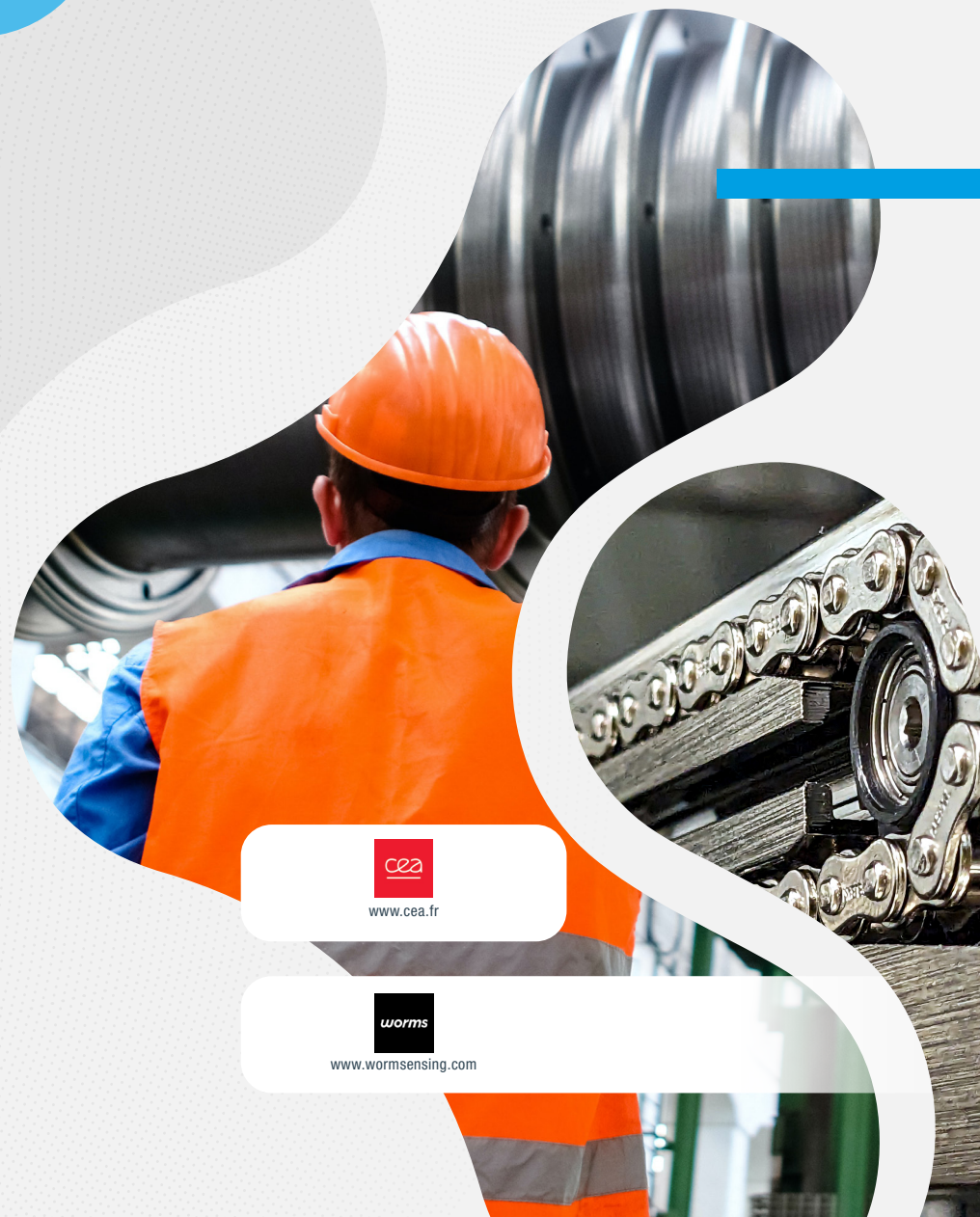
Wormsensing, a spin-off of CEA, is revolutionising the industry 4.0 with its innovative Dragonfly® vibration sensor. Launched in 2024, Dragonfly has already gained significant traction, demonstrating its potential to transform various industries.

Innovation

Dragonfly is a groundbreaking universal sensor that surpasses traditional vibration sensors in sensitivity, versatility, and cost-efficiency. Built with advanced semiconductor technology, it features a 10µm piezoceramic layer, making it 1000 times more sensitive and 100 times more versatile than conventional sensors. Its compact size and zero power consumption further enhance its appeal. Dragonfly's ability to detect microscopic changes in equipment behaviours enable predictive maintenance, reducing downtime and enhancing safety, and optimising operational excellence.

Impact Delivered

The impact of Dragonfly is profound. In the aerospace industry, the sensor has improved detection accuracy by 20%, enabling real-time monitoring and predictive maintenance. In critical industrial equipment health monitoring, Dragonfly has reduced downtime by 15% and extended equipment lifespan by 20%. In manufacturing, the sensor has increased production efficiency by up to 30%. With over 1,000 sensors deployed, Dragonfly has a >95% customer satisfaction rate. Its scalability and adaptability make it a game-changer for industries seeking to optimise operations and reduce costs.



2ND

Fraunhofer

Fraunhofer IGB is one of the 76 institutes/research units of Fraunhofer, a leading RTO for applied research, experimental development and technology transfer.

Next Generation Pathogen Diagnostics

Current diagnostics for pathogens in severely ill patients are lacking from limited sensitivity and specificity. Therefore, life-saving targeted antibiotic therapies in many cases are administered too late or are inappropriate.

Innovation

EARTO Member Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB developed an innovative approach for detecting microbial pathogens in blood based on high-throughput DNA-sequencing of microbial cell-free DNA. Analog to forensic approaches, the innovation demonstrates superior precision than standard-of-care-diagnostics currently used routinely in the clinics.

Impact Delivered

More than 15,000 patients were already diagnosed with the innovative technology providing a chance for better outcome in severely ill patients at intensive care units (ICUs). Also, economic benefits are expected as sepsis is one of the most important drivers of costs in hospitals.



 **Fraunhofer**

www.fraunhofer.de

 **Fraunhofer**
IGB

Fraunhofer Institute for Interfacial
Engineering and Biotechnology IGB

www.igb.fraunhofer.de

3RD



TNO's work focuses exclusively on developing the technologies, systems and applications that demonstrate a direct benefit to partner competitiveness and to society as a whole.

NEStore thermal battery: circular solution accelerating Europe's energy transition

The rapid growth of PV installations in Europe creates significant oversupply around midday, while energy demand peaks in the evening (18-21h), leading to grid congestion. The NESTore thermal battery converts surplus solar power into heat behind the meter, maximise self-consumption (>90% on sunny days) and avoids the need for costly network upgrades.

Innovation

The NESTore is designed to reduce energy losses by more than an order of magnitude, achieving standby losses of just ~1% per day. This is made possible by its patented multi-layer vacuum insulation. Integrated with smart meters and AI-driven algorithms, it charges during solar peaks and discharges during high-tariff periods, delivering over 95% energy efficiency in a maintenance-free, completely fire-safe system at costs below €250 per kWh - making it the most cost-effective storage solution available.

Impact Delivered

With over 100 units deployed within one year, NESTore demonstrates >90% self-consumption, 10-15% peak-load reduction, and sharp decrease in surplus export. The NESTore E30 delivers 5-7 days of hot water for a four-person household while retaining over 99% of stored heat. Fully EU-manufactured and recyclable, NESTore provides immediate grid relief while dramatically reducing the need for electrical batteries.



TNO innovation
for life

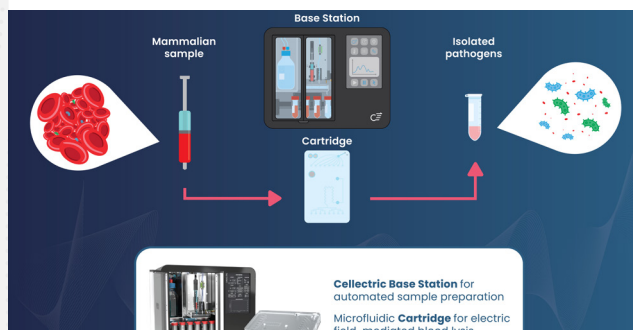
www.tno.nl

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energy solutions

www.newton.energy

NEStore

ELYSIS Electrical cell lysis as key for rapid antibiotic resistance testing



Antibiotic resistance is a growing global health threat, demanding rapid diagnostic solutions. Current methods for identifying resistant bacteria often take days, delaying appropriate treatment and therefore worsening patient outcomes. A new technology from AIT offers a significant breakthrough.

Innovation: This innovation utilises precisely controlled electrical pulses to selectively lyse human cells in clinical samples, leaving bacterial cells intact. This rapid purification process, completed in minutes, streamlines antibiotic susceptibility testing, significantly reducing the time required to identify resistant strains. This can be performed at point-of-care or in a central lab.

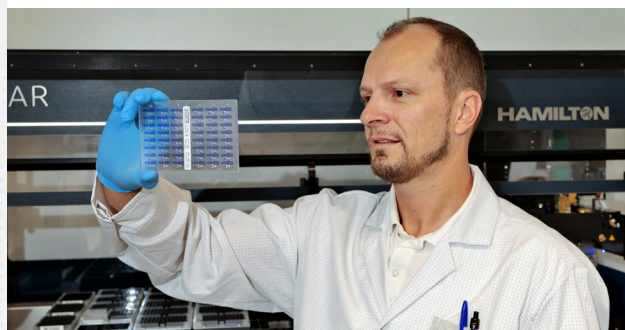
Impact Delivered: Faster results empower clinicians to prescribe targeted antibiotics sooner, improving patient outcomes and reducing hospital stays. By minimising the use of broad-spectrum antibiotics, the technology helps combat the spread of resistance, preserving the effectiveness of these crucial drugs for future generations. With ELYSIS, treatment is faster, cheaper and more effective, revolutionising infection management. Ultimately, this leads to healthier communities and a more sustainable healthcare system.



The Austrian Institute of Technology (AIT) is a renowned provider of research services and innovations for industry and society in key areas of research.

www.ait.ac.at

VeriPlate: Liquid volume verification made easy



Thousands of labs in the pharmaceutical industry, diagnostics, and life sciences rely on automated liquid handling systems for high-throughput screenings and assays. Precision in pipetting is critical to meet regulatory standards and ensure reproducibility.

Innovation: The idea - patented by CSEM and industrialised by Hamilton - is simple. At the heart is an SBS plate containing 48 capillary slots, where the liquid aliquot is dispensed. The liquid moves along the capillaries, and the distance it covers depends on the sample volume. An optical scanner analyses the image and determines the liquid volume in just seconds.

Impact Delivered: *"This is a significant advancement in the safe use of automated liquid handling systems",* says Dr. Christoph Jung, Vice President Robotics at Hamilton. *"VeriPlate is an essential part of our Pipetting Excellence program and has a substantial impact on our business and customers by enabling routine quality checks in the lab workflow."* The launch of VeriPlate in April 2024 marked the successful end of the CSEM-Hamilton collaboration.



CSEM is a non-profit-oriented public-private Swiss technology innovation centre renowned for developing advanced technologies with profound societal impact, with life sciences as a key market.

www.csem.ch

Programming robots with a gesture, the first step in a new robotics revolution



In the world of advanced manufacturing, robot programming remains one of the main challenges for industrial automation. Traditionally, programming a robot requires coding skills and complex configurations, limiting its use to specialists. But what if programming a robot were as simple as drawing a movement with your hands? That is the concept behind ROBOMIMIC, an innovative imitation-based programming system that completely changes the rules of the game, developed by Aitiip Technology Centre.

Innovation: ROBOMIMIC is a multi-camera system with decentralised processing, capturing real-time motion data from different angles. Using advanced cameras and a central unit, it translates movements into precise 6D trajectories. Operators can demonstrate tasks using a dummy tool, and the robot replicates them with millimetric precision.

Impact Delivered: Its intuitive interface and virtual simulation optimise processes before execution, reducing costs and enhancing flexibility. Applicable in aerospace, automotive, and advanced manufacturing, ROBOMIMIC streamlines assembly, material handling, and process optimisation. In R&D, it accelerates innovation by removing technological barriers, while in education, it enables practical robotic programming training. ROBOMIMIC dramatically reduces setup time, ensures precision, minimises errors, and enhances workplace safety.



Aitiip specialises in plastics and mould manufacturing, driving innovation, sustainability, and industry 4.0 with 140+ R&D projects and 11 patents.

www.fedit.com - www.aitiip.com

SOGUN: Precision and efficiency in shotcrete applications



The SOGUN system, developed by DRAGADOS in collaboration with CARTIF, is set to revolutionise tunnel construction, especially for shotcrete applications.

Innovation: This automated technology uses an integrated LiDAR scanner to create a highly accurate 3D georeferenced point cloud of the tunnel surface. The collected data is instantly compared to the theoretical tunnel design and projected onto the walls, visually indicating areas of over- or under-concrete using colours and numerical markers.

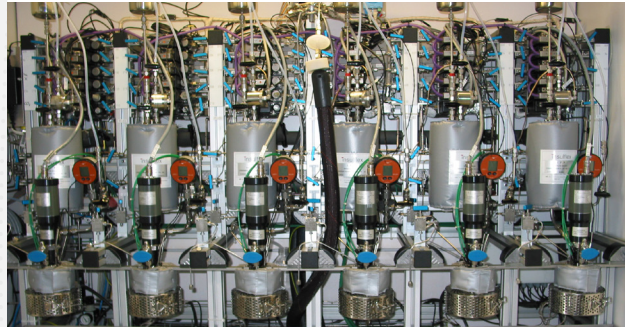
Impact Delivered: SOGUN drastically reduces processing time to less than one minute, compared to the 1.3 to 3 hours required for manual marking. It also improves accuracy through in-construction analysis. The system simplifies the operator's job by providing clear, real-time visual guidance. Its benefits include increased productivity through faster and more accurate execution, improved sustainability by reducing material waste, and improve safety by minimising the risks of manual marking in critical areas of tunnels.



FEDIT-CARTIF is a Spanish RTO focused on applied research in energy, industry, and sustainability to foster innovation, development and technology transfer.

www.fedit.com - www.cartif.es

DMX™ CO₂ capture technology



The French DMX™ technology, developed by IFPEN, is an advanced post-combustion CO₂ capture process aimed at reducing the carbon footprint of industrial emissions. It is a second-generation process using a solvent that reduces the energy intensity for carbon capture by nearly 30% as compared to the MEA (Monoethanolamine) reference process.

Innovation: The DMX™ process is a CO₂ post-combustion capture process based on absorption by a demixing solvent, the DMX™ solvent. The DMX™ process has been successfully demonstrated for CO₂ capture on steel gas in Arcelor Mital site in Dunkirk. It can also be used for capturing CO₂ from other types of emitters such as waste incinerator, cement plant, district heating, and biomass-based electricity production. Particularly effective for industrial emissions with low to medium CO₂ partial pressures, the DMX™ process offers high capture efficiency, reduced energy consumption, and cost savings.

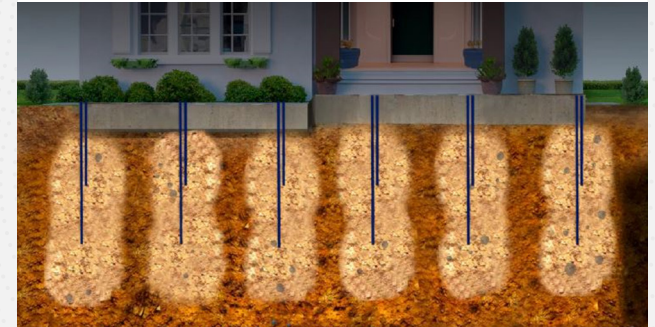
Impact Delivered: By minimising solvent degradation and operational costs, it provides a scalable, economically viable solution for mitigating climate change. With its reliability and scalability, the DMX™ process is a key technology for achieving global decarbonisation targets and industrial emission reduction goals by 2050.



IFP Energies Nouvelles (IFPEN) is a major player in research and innovation, providing solutions to societal and industrial challenges in energy, mobility, environment, and climate.

www.ifpennergiesnouvelles.com

MAGELLAN: A Game Changer in the Treatment of Clay Soils



Born from an innovation challenge in 2019 at IFP Energies nouvelles (IFPEN), the MAGELLAN solution represents a significant advancement in the treatment of the swelling-shrinkage of clays, a phenomenon with strong social, societal, economical, and environmental impacts.

Innovation: Initiated by an IFPEN employee facing the risk of shrink-swell of clays, the MAGELLAN solution was co-developed with Solinjection, a subsidiary of the Talensis group. This innovation uses a silica-based mineral gel, precisely adapted to the geotechnical characteristics of the soil. Laboratory and in-situ tests have confirmed its effectiveness in making soils less sensitive to the alternation of drought and rain. The patented injection technology and the in-situ visualisation technique using electrical resistivity tomography ensure optimal application. The solution has been validated by an independent control office and benefits from a ten-year warranty insurance.

Impact Delivered: MAGELLAN is currently being marketed, with contracts already signed and initial projects underway. This solution, designed and developed in collaboration with specialised economic actors, marks a turning point in the treatment of clay soils under foundations, reducing costs and ecological impact compared to existing methods.



IFP Energies nouvelles (IFPEN) is a major player in research and innovation providing solutions to societal and industrial challenges in energy, mobility, environment and climate.

www.ifpennergiesnouvelles.com

CEVESA: Holistic Long-Term Electricity Market Planning for the Energy Transition and Decarbonisation



Achieving Europe's energy transition goals requires sophisticated tools to navigate the complexity of electricity markets. CEVESA, co-developed by INESC TEC and Universidad Pontificia Comillas, empowers policymakers, regulators and industry leaders with high-resolution simulations and robust planning capabilities.

Innovation: CEVESA is an advanced software platform for long-term electricity market planning and operation. It integrates energy, reserve and capacity remuneration models, supporting strategic investment decisions for renewables, storage, green hydrogen and electric mobility. Its multi-zonal, hourly resolution enables comprehensive market coupling analysis and sector integration (EVs and H2).

Impact Delivered: CEVESA is being validated by China Three Gorges Europe in its investment strategies and policy decisions, thus supporting energy companies and policymakers in accelerating the energy transition. It contributes to reducing CO₂ emission target by 2030 of up to 30%, thus cutting system costs by 15%, accelerating Europe's decarbonisation goals and supporting UN's Sustainable Development Goals 7, 8, 9, 11, 12 and 13.



INESC TEC (Portugal) and Universidad Pontificia Comillas (Spain) deliver innovative solutions for energy transition, combining cutting-edge research and industry expertise.

www.inesctec.pt

3DMPWire Material-efficient Cu wire-based 3D printing technology



3DMPWire invention addresses the needs for more efficient and waste-free 3D printing Wire Arc Additive Manufacturing (WAAM), specifically in the production of corrosion-resistant components operating in marine environments.

Innovation: 3DMPWire is an innovative production technology of newly developed Cu-based feedstock materials (wires) for 3D printing technology and 3D_WAAM printing technology of components such as water turbine propellers, seawater pump elements, (impellers, manifolds) and valves.

Impact Delivered: A full-size five-blades prototype of the propeller was successfully printed and machined. The solution proved that it is possible and viable to replace traditional manufacturing technologies with additive manufacturing successfully. The innovative products (Cu-based wire) and 3D_WAAM printing technology can also be used to manufacture other products, in many branches of industry, e.g. wide application in the armaments sector.



Łukasiewicz-Institute of Non-Ferrous Metals provides research and innovative solutions in the fields of non-ferrous metals processing, critical elements recovery, new-generation materials.

www.lukasiewicz.gov.pl - www.pit.lukasiewicz.gov.pl

FAST: Flood Advisor Service Technologies



Given the increasing climate uncertainty and the foreseeable rise in extreme flood events, such as the recent DANA flooding in Valencia (Spain) on October 29th 2024, there is a great need for the use of technologies in the early prediction of these events, in order to give enough advance warning that will save lives and reduce economic losses. FAST (Flood Advisor System Technology) positions itself as an effective technology-based solution to provide municipalities, infrastructure operators, and industries with sufficient advance warning of flood risks for proper management and activation of response protocols.

Innovation: EARTO Member TECNALIA offers FAST, an advanced real-time data capture system that integrates information from hydrometeorological stations and proprietary sensors to predict the evolution of river levels. Thanks to Artificial Intelligence and Machine Learning algorithms, the platform accurately projects flood risks, issuing early warnings. Commercialised by IntelliAlert, the start-up was created by Tecnalia and Team Engineering Consulting Group.

Impact Delivered: This innovation will promote safety and resilience against natural disasters, such as flooding, in the fight against climate change. The expected impact will include saving lives and reducing economic losses associated to extreme flooding events.



The largest Research and Technology Organisation in Spain and member of the Basque Research and Technology Alliance. We transform technological research into prosperity.

www.tecnalia.com

Renaissance: Boosting Software Maintenance Productivity



It is widely recognised that 60 to 80% of the total cost of software ownership is attributed to maintenance. Globally, software maintenance costs are estimated to be around a trillion euros per year. These substantial investments in maintenance can hinder innovation and growth. With the current scarcity of software engineering experts, there is a pressing need to enhance software maintenance productivity.

Innovation: Renaissance introduces a novel approach to software maintenance by leveraging a graph-based methodology and a suite of dedicated domain-specific languages. This approach provides the software industry with powerful code analysis and transformation technologies that can be utilised by most software engineers without requiring expertise in compiler technology.

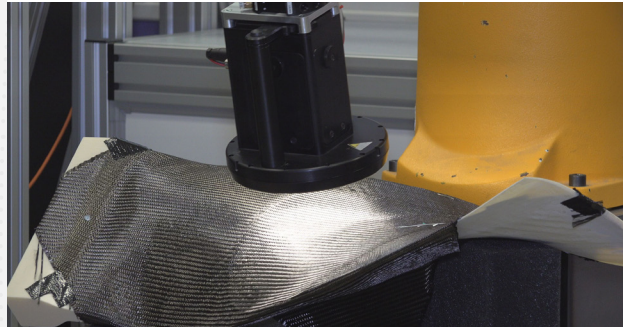
Impact Delivered: Renaissance is currently employed by two global software service providers. Over the past few years, it has significantly improved productivity in various industry projects, recently achieving a threefold productivity increase for a specific large-scale maintenance task.

TNO innovation
for life

TNO, an independent Dutch RTO where professionals put their knowledge and experience to work in creating smart solutions to complex issues for over 90 years.

www.tno.nl

F-Scan: Revolutionising Composite Inspection for a Sustainable Future



PROFACTOR's F-Scan technology sets a new standard in composite material inspection. It enables high-speed, automated inline quality control for carbon and glass fibre components, ensuring consistent product quality from the first production step. By combining speed, precision, and flexibility, F-Scan supports manufacturers in delivering safer, more reliable products while promoting sustainable production.

Innovation: F-Scan inspects fibre-reinforced composites at speeds up to 1 m/s. Its compact system (200 x 200 x 300 mm) captures high-resolution images (40-60 µm) over a 50 x 50 mm² field of view. Thanks to a proprietary reflection model, 288 high-power LEDs, and advanced algorithms, F-Scan accurately detects fibre orientation, misalignments, and surface defects - even on complex, reflective surfaces. Its modular design allows easy integration into various production lines and applications.

Impact Delivered: F-Scan reduces material waste by up to 50%, cuts inspection times by 30%, and improves defect detection by 30 to 50%. This ensures higher product safety in critical industries like aerospace and automotive, aligning with Sustainable Development Goals 3, 8, 9, and 12. By automating inspection tasks, it fosters safer working conditions and enhances production efficiency, typically delivering ROI within 6 to 12 months.

UAR
Upper Austrian Research GmbH

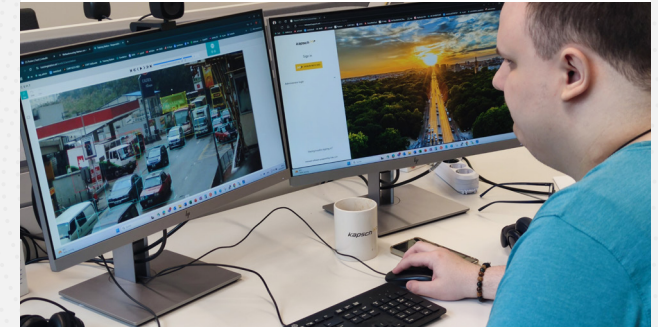
PROFACTOR

Upper Austrian Research GmbH is the leading organisation for non-university research in Upper Austria. It promotes innovative solutions and provides access to excellent R&D capacities.

PROFACTOR is an Austrian RTO driving innovation in industrial quality control and advanced manufacturing, bridging applied research with industrial implementation for sustainability.

www.uar.at - www.profactor.at

Responsible Annotation: Advancing an Inclusive AI Workforce



Contrary to common belief that Artificial Intelligence (AI) is a job killer, Responsible Annotation promotes inclusion, creating new job opportunities for people with disabilities through AI.

Innovation: Annotated data is vital for AI development, traditionally done by able-bodied individuals under often poor conditions in low-wage countries. Austria lacks a fair annotation market. Responsible Annotation provides people with disabilities access to this work, valuing their unique skills like exceptional attention to detail, crucial for annotation tasks and promoting inclusion in AI.

Impact Delivered: The training station, designed for autistic and deaf individuals as well as those with visual or psychological impairments, has significantly reduced the dropout rate in job training at Kapsch TrafficCom from 27% to 6%. Responsible Annotation in Kapsch TrafficCom has successfully placed 23 individuals in annotation jobs and created six qualification spots specifically for autistic people in Linz. The training station is now integral to job assistance at Kapsch TrafficCom, used in clearing and onboarding processes. A pilot project with Diakoniewerk engaged 25 individuals with disabilities, showcasing the effectiveness of the station in talent search and supporting diverse workforce needs. The start-up Responsible Annotation Services was launched.

UAR **scch** { }

Upper Austrian Research GmbH

software competence
center hagenberg

Upper Austrian Research GmbH is the leading organisation for non-university research in Upper Austria. It promotes innovative solutions and provides access to excellent R&D capacities.

Software Competence Center Hagenberg specialises in integrating Software and AI Systems, bridging international research with domestic industry and conducting world-class research.

www.uar.at - www.scch.at

IMPACT **EXPECTED**

Discover
more innovations
from RTOs

1ST

VTT is a visionary research, development and innovation partner for companies and society, and one of the leading technical research organisations in Europe.

Cryogenic CMOS: The next generation of chips for quantum computing and beyond

The increasing size and huge cost of quantum computers, the cost and ineffectiveness of regular electronics in space and the high cost to mitigate the enormous heat generated from chips running in supercomputers and datacentres - all have a common problem and require the same solution: electronics that consume and dissipate very little heat.

Innovation

VTT has a long history of expertise in microelectronics and quantum technology, including R&D in Cryogenic CMOS (Complementary Metal-Oxide-Semiconductor) chips. Unlike standard CMOS chips, which generate excessive heat, Cryo-CMOS ensures minimal energy dissipation, and are designed to operate in extremely cold environments (-270°C). In 2023, aiming to create impact by scaling-up innovations, a spin-off from VTT was launched, SemiQon. SemiQon has further should be developed this innovation, which features superior energy efficiency and performance, and will be produced in a European pilot line foundry.

Impact Expected

Cryogenic CMOS is the next generation of chips set to revolutionise multiple industry verticals. It has the potential to contribute to various UN SDGs by enabling advancements in fields like quantum computing, energy-efficient electronics, space exploration, and environmental monitoring. Beyond its environmental and economic benefits, this innovation strengthens the EU semiconductor industry and supports Europe's strategic autonomy in key technologies.

VTTwww.vttresearch.comSemiQon™www.semiqon.tech

2ND

ŁUKASIEWICZ-WIT

The Łukasiewicz Research Network is one of the biggest research networks in Europe, with over 7,000 staff and 22 research institutes in 12 cities across Poland.

Blazing a Safer Future: High Fire Resistance Board Ł-WIT

Urban areas are soaring skyward at an unprecedented pace, heightening the need for dependable fire safety solutions. Across the globe, tunnels, skyscrapers, and industrial sites demand innovations that save lives and resources.

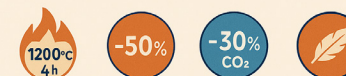
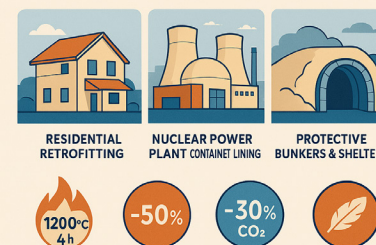
Innovation

Łukasiewicz Research Network - Warsaw Institute of Technology answers this call with the High Fire Resistance Board Ł-WIT: a breakthrough fire-retardant panel that defies conventional limitations. Lightweight yet remarkably durable, it features an eco-friendly core derived from only European raw materials. The result is a resilient, cost-efficient shield that meets modern construction challenges.

Impact Expected

By significantly cutting installation overheads and slashing carbon footprints, the High Fire Resistance Board Ł-WIT advances both financial and environmental sustainability. Its implementation paves the way for safer living and working spaces, ensuring that even the densest urban landscapes remain protected. Beyond its technical merits, the High Fire Resistance Board Ł-WIT represents a new era in responsible innovation.

HIGH FIRE IMPEDANCE BOARD Ł-WIT APPLICATIONS



Ł-WIT



www.lukasiewicz.gov.pl

3RD

➤ INESC TEC

INESC TEC is a leading Portuguese RTO that advances science and technology to promote innovation and deliver societal and economic impact across multiple sectors.

KEPsoft: A Pan-European Solution to Enhance Kidney Transplant Access and Efficiency

Kidney Exchange Programmes (KEPs) provide life-saving transplant opportunities for patients with end-stage renal disease and incompatible living donors. However, most KEPs rely on fragmented, difficult-to-maintain systems, limiting transplant access and cross-border cooperation.

Innovation

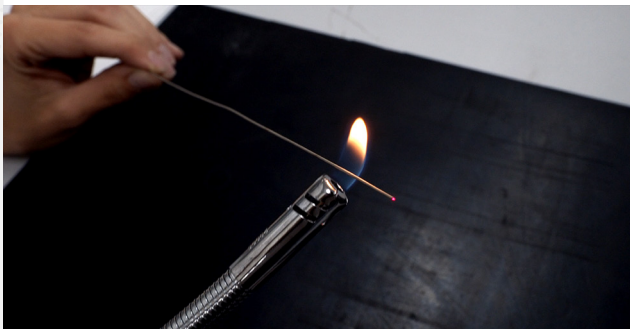
Developed by INESC TEC with partners KRTK Hungary, Óbuda University, and the University of Glasgow, KEPsoft is the first pan-European software platform that uses optimisation algorithms to identify the best transplant matches, increasing the efficiency of national and international KEPs. Its modular architecture ensures interoperability with existing IT systems and adaptability to different legal, clinical, and data governance frameworks.

Impact Expected

The adoption of KEPsoft is expected to increase the number of living donor kidney transplants and shorten waiting times. It advances Value-Based Healthcare by delivering up to € 2 million in healthcare savings per 100 patients moved from dialysis to transplantation, while improving patient outcomes, quality of life, and enabling more patients to return to active lives. KEPsoft fosters cross border healthcare collaboration, driving equity, efficiency, and sustainability in kidney exchange across Europe.



Overcome the last frontier in fiber optic sensing for ultra-harsh environments



Fiber optic sensors (FOS) outperform conventional sensors (thermocouples, gauges) in size, durability, and multi-point measurement. They are ideal for energy, aerospace, and civil engineering. However, their use above 450°C is limited, as high temperatures cause instability, requiring costly coatings like gold.

Innovation: AIMEN has developed a nickel-coated FOS technology enabling operation beyond 700°C while measuring temperature and strain. This coating (20 µm to 700 µm) surpasses commercial solutions in robustness and uniformity. The sensors also endure high-temperature embedding (e.g., welding), allowing seamless integration into structures.

Impact Expected: These innovations expand FOS applications in extreme environments, monitoring multiple parameters (strain, temperature, pressure, corrosion). Successfully tested in energy and naval sectors, they also hold potential in aeronautics, metallurgy, and nuclear power. Companies in FOS market are engaged, with commercialisation expected in 2025/2026.



AIMEN is a leading European innovation centre in advanced manufacturing, smart materials, digital technologies and laser processing, providing R&D industrial solutions.

www.aimen.es

SlotMachine, a new collaborative solution for improved traffic management



The developed privacy-preserving ATFM slot exchange platform, based on secure multi-party computation and blockchain technology, leads to the extension of existing user-driven prioritisation processes.

Innovation: SlotMachine envisions a new kind of marketplace for slot swapping and air traffic management. The platform enables more flexible, faster, scalable and (semi-)automated processing of slot swapping transactions in a fair and trustworthy manner. Built with a privacy-first approach, it protects airlines' sensitive data from competitors and airport operators, unlocking the full potential of collaborative slot swapping.

Impact Expected: More effective because it protects secure, sensitive airline data (flight cost structures), inter-airline slot swapping is seen as a very promising development in the younger aviation industry to improve efficiency through local optimisation of airport infrastructure. It will therefore lay the foundations for an essential element in the future that will contribute to better use of existing resources, higher airline efficiency, lower emissions and shorter delays for passengers.



AIT Austrian Institute of Technology is Austria's largest RTO, a leading development partner for the industry and a top employer within the international scientific community.

www.ait.ac.at

zBMS: improving battery performance and safety



Batteries are crucial for the electrification of transport and the integration of renewable energy sources. Battery management systems (BMS) are essential for monitoring and optimising battery performance, ensuring safety, longevity, and efficiency in energy storage and electric vehicles.

Innovation: CSEM has developed a novel battery management system called zBMS that exploits electrochemical impedance spectroscopy. zBMS extracts physics-based battery models, where the frequency-domain processing framework known as Distribution of Relaxation Times was extended into the time-domain to also capture ultra-low electrochemical transport and degradation phenomena. The patented innovation provides a multimodal AI-ready diagnostic framework that radically improves the quality and interpretability of BMS data.

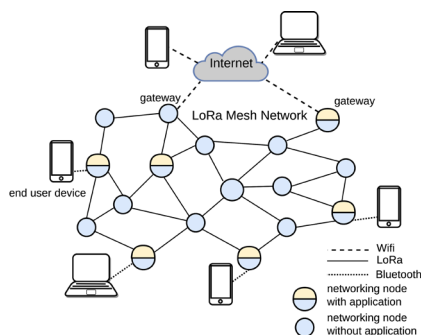
Impact Expected: This innovation has the potential to significantly improve battery performance and safety. At the same time this innovation strongly supports the European circular economy goals, thus positioning Europe at the forefront of €50B sustainable battery management business. Based on ongoing developments it is expected that first products will reach the market within the next two years. It is expected that the innovation will first be introduced to battery energy storage systems, followed by the mobility sector and niche applications. The target market is worldwide.



CSEM is a Swiss technology innovation centre that develops and transfers advanced technologies with high societal impact to industry.

www.csem.ch

LoRaMesher software library for building LoRa mesh networks



LoRaMesher is a software library that enables deploying LoRa mesh networks for distributed applications on top of the existing LoRa communication physical layer.

Innovation: Compared to alternative solutions, deploying LoRaMesher networks is very cheap, very fast by node autoconfiguration, and does not require any specific technical knowledge. LoRaMesher networks have several innovative technical capacities such as node-to-node communication, multi-hop, and large and reliable payload transmission capacity.

Impact Expected: LoRaMesher can have a strong social impact by being an inclusive communication solution. This inclusivity is given by LoRaMesher being based on open knowledge and open source. From the environmental impact point of view, LoRa mesh networks can be considered resource-saving communication solutions, which can easily be solar powered. Regarding the economic impact, LoRaMesher can become part of the recent ICT architecture that moves data and communication towards the edge of the networks. By enabling distributed applications on IoT devices, LoRaMesher may integrate tiny nodes of Edge AI applications as service providers.



The Universitat Politècnica de Catalunya - BarcelonaTech (UPC) is a public institution of higher education and research, specialising in architecture, engineering, and technology.

www.fedit.com - www.cit.upc.edu

DiCES: A parallel and sustainable implementation of CE Strategies



With rising environmental awareness, scarce access to virgin materials and stricter regulations like the EU Green Deal, companies face pressure to make value chains more sustainable. Product life cycles are extending, and supply chains are evolving into closed loops. A key challenge in the circular economy (CE) is managing unpredictable product returns and the complexity of selecting the optimal ReX strategy. A Wear and Tear Prediction and Decision Model can turn these challenges into opportunities, enabling competitive and sustainable value creation.

Innovation: FIR, in collaboration with its partners, developed the concept of an IT architecture to implement parallel and sustainable ReX strategies in the manufacturing industry. In addition to integration with ERP/ME systems, following software solutions were developed: Wear and Tear Prediction, which calculates wear based on usage, product, and testing data, and Decision Model, with CO₂ accounting, circular economy strategy simulation, and decision-making.

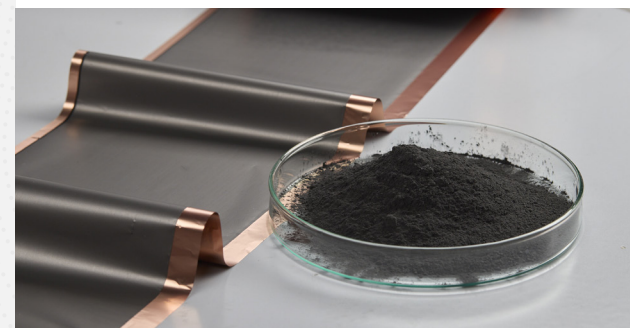
Impact Expected: This innovation will enable the implementation of a multidimensional circular economy in manufacturing companies, making CE an integral part of their operational order processing. Additionally, it will enable the prediction of wear usage and the identification of the most suitable ReX strategy for each specific product.



FIR is an intersectoral RTO driving innovation in industrial management and business organisation, boosting SME competitiveness and advancing an upgraded circular economy.

www.fir.rwth-aachen.de - project-dices.de

DRYtraec®: An enabler for cost-efficient battery production



The growing electrification of transport and energy highlights the need for electric energy storage - especially for lithium-ion batteries. An essential step for future green production schemes is to reduce energy consumption, factory footprint and avoid toxic chemical consumption.

Innovation: DRYtraec® is an innovative dry coating process developed by Fraunhofer IWS for battery electrode production. This environmentally friendly method eliminates the use of toxic solvents in the energy-intensive electrode coating step. It dispenses the need for drying-ovens and solvent recovery systems, which is an enormous cost- and footprint advantage compared to state-of-the-art gigafactories. This reduces energy consumption in battery cell production by up to 30% and decreases equipment footprint by up to 75%. Besides LIB production, DRYtraec® is also an ideal solution for next-generation batteries offering higher energy density and improved safety.

Impact Expected: DRYtraec® is an enabler for cost-efficient battery production in countries with high energy prices. This strengthens the European value chain in the energy storage sector and keeps the European automotive industry competitive, securing a significant number of jobs in Europe.



The Fraunhofer IWS is one of the 76 institutes/research units of Fraunhofer, a leading RTO for applied research, experimental development and technology transfer.

www.fraunhofer.de - www.iws.fraunhofer.de

PLANET'AIR: Pioneering Air Quality Solutions for Tomorrow's Cities



PLANET'AIR is a transformative SaaS platform revolutionising air quality management for urban environments. By combining state-of-the-art simulation technology with extensive real-world datasets, it equips urban planners, port authorities, and industrial leaders with rapid, precise, and actionable insights, empowering them to tackle air pollution challenges effectively and with greater confidence in shaping sustainable urban futures.

Innovation: PLANET'AIR leverages advanced mesoscopic modelling to simulate traffic dynamics, vehicle fleet evolutions, and policies such as Low Emission Zones - all within minutes. Built upon millions of kilometres of real-world driving data, this innovative tool translates complex analytical results into intuitive, user-friendly dashboards, making sophisticated air quality strategies accessible to decision-makers.

Impact Expected: PLANET'AIR fosters healthier, more sustainable cities by driving pollutant reductions of 5 to 15%, enhancing public health outcomes, and delivering significant healthcare cost savings. By promoting eco-friendly transport solutions and equitable policy measures, it ensures cleaner air and improved living conditions for urban populations while supporting global sustainability goals.



IFP Energies nouvelles (IFPEN) is a major player in research and innovation providing solutions to societal and industrial challenges in energy, mobility, environment and climate.

www.ifpennergiesnouvelles.com

Heat2Power®: from waste heat to lasting value



Between 40 to 50% of our energy is converted to waste heat. This energy is rarely recovered and put to good use, very often because industries do not know how to address this valorisation opportunity.

Innovation: Heat2Power® is an optimisation software calculating the waste heat potential of exhaust gases, cooling towers and generic streams. It determines the best heat-to-power solution from a whole list of technologies, with the objective of maximising the revenues from electricity and/or steam production. It is based on a process integration approach formulated as a mathematical programming model and streamlined for process engineers and energy auditors.

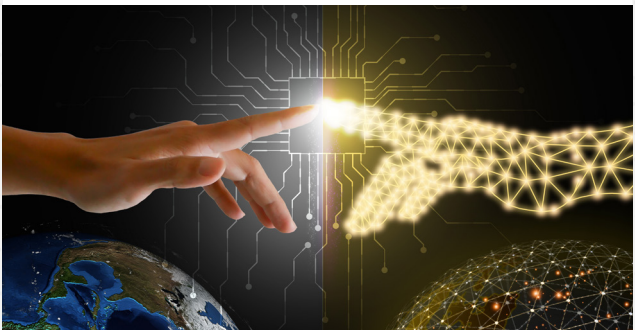
Impact Expected: The assessment of waste heat-to-power scenarios is complex due to the large number of variables to consider. With Heat2Power®, the retained solution will be systematically optimal, with results showing a 30% increase in electricity yield as compared to a standard heuristic approach with, as such, reduced payback time. Furthermore, end-users will save about 35 to 40% of its assessment time by using the tool to conduct the assessment.



Luxembourg Institute of Science and Technology, is a mission-driven Research and Technology Organisation active in the fields of materials, space, environment, and IT.

www.list.lu

Game changer in tackling societal challenges



Twinations is an LLM-enhanced computational platform dedicated to developing social digital twins of nations, modelling important societal challenges the population of interest faces, and simulating plausible effects of user-defined what-if scenarios.

Innovation: Twinations tests solutions in silico prior to a roll-out in the real world and assesses their broader plausible impacts on multiple domains. It uses high-value datasets, novel machine learning techniques, and algorithms of human cognition and behaviour to the largest extent possible to increase data-richness of a multitude of layers substantial to how the societal challenge works and can be solved.

Impact Expected: This innovation offers a significant increase in the realism of computational representation of the real-world social system by utilising available data to the highest extent possible, and a significant decrease in time required to develop a social model and assess the results of simulated scenarios. This cutting-edge tool helps us to tackle complex societal challenges such as climate change, spread of mis- and disinformation, or radicalisation of attitudes by simulating in silico plausible effects of candidate actions. Using natural language in the interaction with the tool and exploration of data and simulated results makes the user experience friendly and intuitive.



NORCE conducts research in energy, health, climate, environment, society and technology for public and private sectors, to facilitate informed and sustainable choices.

www.norceresearch.no

From Waste to Value: Smart Traceability for Safer Plastic Recycling



As outlined by the EU Green Deal and Circular Economy Action Plan, verifying recycled content in products is key to replacing virgin plastics. But this is no easy task. Measuring recycled content requires precise tracking from production back to source.

Innovation: PRecycling develops an integrated methodology for sorting, sampling, and tracing plastic waste streams, including the detection of legacy additives, and introduces standardised procedures for analysing both waste and recyclates. This ensures the production of high-quality secondary raw materials based on their degradation level, with digital tools ensuring traceability and safety.

Impact Expected: Through life cycle and cost analysis, PRecycling proves that safe, certified products made from recyclates are economically viable. Demonstrators include home appliances, toys, and 100% recycled textiles from multiple EU regions, with potential applications in packaging, vehicles, and electronics, offering scalable and replicable solutions for a truly circular plastic economy. Its impact covers industrial, commercial and societal levels, demonstrating that high-quality recyclates can power new safe products for different industries, while reinforcing EU circularity goals and boosting consumer confidence.



AIJU is a Spanish technology centre that drives innovation in the plastic industry by developing advanced materials and technologies to enhance efficiency and environmental impact.

REDIT joins the 11 RTOs in Valencia Region offering a wide range of R&D&I advanced services to businesses, especially SMEs, which need their support to innovate and be competitive.

www.aju.es - www.redit.es

PET: Enabling transaction monitoring while safeguarding privacy



Money laundering is a significant concern, with Europol estimating its value at 1.3% of the EU GDP. Financial institutions are legally obligated to identify criminal activity within the financial system. Transaction monitoring is crucial for detecting money laundering or terrorism financing; however, analysing transaction data poses privacy concerns. Previous collaborative efforts have faced criticism from authorities such as The European Data Protection Board, recently leading to the cessation of operations by Dutch banks collaboration: Transaction Monitoring Nederland.

Innovation: Privacy Enhancing Technology provides a solution, enabling transaction monitoring while safeguarding the privacy of legitimate actors. The Alliance of Privacy Preserving Detection of Financial Crime project has demonstrated that Anti Money Laundering algorithms can function effectively with Privacy Enhancing Technology (PET). This approach offers a method for identifying money laundering and terrorism financing while maintaining the privacy of lawful individuals. Collaboration also increases enforcement chain efficiency, potentially reaching up to € 8 billion annually.

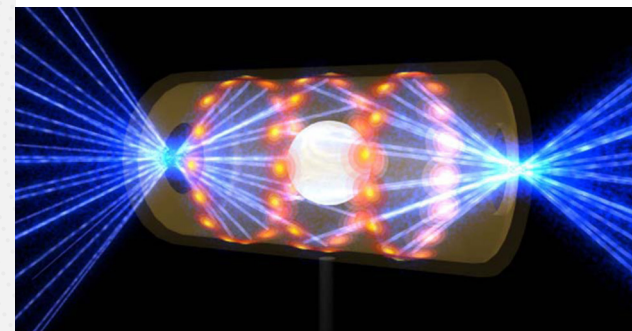
Impact Expected: The findings of this research extend beyond the financial sector, facilitating further collaboration in other fields such as healthcare, logistics, defence, and the public sector, all benefiting from the advancements made by this project.



TNO, an independent Dutch RTO where professionals put their knowledge and experience to work in creating smart solutions to complex issues for over 90 years.

www.tno.nl

Laser Ultrasound enables Breakthrough Improvement in Fusion Target Quality



Nuclear fusion promises clean, virtually limitless energy. A key challenge lies in the production of ultra-precise fuel targets. Researchers at RECENTD and General Atomics have developed a novel laser ultrasound method to measure wall thickness and variations in small hollow spheres with nanometer precision - enabling the next step toward efficient fusion energy.

Innovation: The FreDomLUS System uses laser ultrasound to measure the wall thickness of opaque small objects with unprecedented precision. Ultrasonic resonances are excited by a laser and measured via laser interferometry - measuring wall thickness in the micrometer range, fully non-contact without damaging the measured object.

Impact Expected: The developed system enables significantly improved quality control in the production of fusion fuel targets - crucial for achieving efficient, symmetric fusion reactions. It supports the development of clean fusion energy and has further potential in sectors like medical technology, mobility, and aerospace where precise, non-destructive measurements are essential.



The Upper Austrian Research GmbH (UAR) is the leading organisation for non-university research in Upper Austria. It promotes innovative solutions and provides access to excellent R&D capacities.

The Research Center for Non-Destructive Testing GmbH (RECENTD) is a leading Austrian RTO for applied research advancing optical and acoustic technologies from lab to industrial application.

www.uar.at - www.recentd.at

CCStage: the future of the performing arts available for everyone



CCStage celebrates innovation by championing a vision of a world where everyone has a seat at the table of culture. It rewrites the script of what's possible in the performing arts. It brings art to life - anytime, anywhere, for anyone! How? CCStage enables people to perform together from multiple places at the same time. Real-time, easy-to-use, web-based, interoperable.

Innovation: CCStage provides real-time video-conferencing capabilities, video production features, and video mixing mechanisms in one tool, to make it universally accessible with web technologies. Quick setup and usable from any kind of device, it aims to democratise culture by making it accessible for everyone.

Impact Expected: It enables scenarios that wouldn't have been possible without specific professionals, skills and equipment before, and enables all kind of micro-SMEs to have the possibility to create distributed performances.



Vicomtech is a non-profit applied research centre specialised in computer vision, multimedia and data analytics located in San Sebastian and Bilbao, Spain.

vicomtech.org

RTOs INTERNATIONAL NETWORK **RIN**

Discover
more innovations
from RTOs



AIST is one of the largest public research organisation in Japan. It strives to meet the needs of businesses through its own marketing company, AIST Solutions.

Insight Without Exposure: Unlocking Hidden Value in Private Data

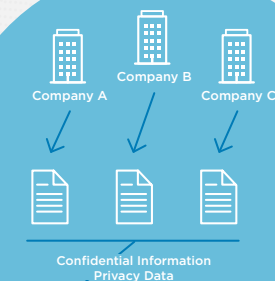
Across industries, valuable corporate data remains untapped not due to lack of utility, but because of risks tied to its use, e.g., privacy concerns, compliance burdens, and fear of leaks. ZenmuTech is shifting this paradigm with QueryAhead™, a secure computation platform that enables insights without exposing raw data, thus empowering organisations to collaborate and innovate safely.

Innovation

QueryAhead™ is built upon research by AIST. Using secret sharing, data is split into two encrypted shares on the client side and sent to two separate servers. Each server holds only meaningless fragments, enabling computation without revealing the original data. EDPB (European Data Protection Board) recognises MPC (Multi-Party Computation) as a tool for secure cross-border data transfers under GDPR (General Data Protection Regulation). QueryAhead™ is designed to meet these standards for compliant and privacy-preserving collaboration.

Impact Delivered

In materials development, QueryAhead™ enables companies to jointly analyse proprietary data to accelerate innovation whilst maintaining the anonymity of said data, as demonstrated in PoC projects. In real estate, buyers and sellers are matched without exposing identities or property details. By securely letting sensitive data take flight, ZenmuTech unlocks new value while ensuring confidentiality and trust.



QueryAhead®
Secure Multi-Party Computation Platform



Take a look at our presentation video "FE0Acq0Usp4"



The Agency for Science, Technology and Research (A*STAR) is Singapore's lead public sector R&D agency. Through the Technology for Enterprise Capability Upgrading (T-Up) programme, A*STAR seconded research scientists to MetaOptics Technologies to support its innovation and product development in metalenses.

Enabling Scalable Manufacturing of Metalenses

With the rising demand for clearer, smaller lenses in smartphones, wearable tech, and self-driving systems, Singapore startup MetaOptics Technologies is addressing a major challenge: mass-producing advanced, ultra-thin lenses known as metalenses. These flat, tiny lenses offer high-quality imaging, especially in compact devices where space is limited.

Innovation

To accelerate product innovation, MetaOptics collaborated with A*STAR researchers to develop a highly precise Direct Laser Writer (DLW), capable of quickly creating and testing tiny microscopic lens structures. They also pioneered a groundbreaking technique to directly pattern these lens structures onto large, industry-standard glass wafers. These advancements simplify the process, reduce production time, and lower costs, making high-quality metalenses easier and cheaper to manufacture on a large scale.

Impact Delivered

Through these innovations, MetaOptics is driving the creation of smaller, more powerful imaging systems. The company is moving from initial research stages to real-world applications, supplying metalenses for mini-projectors and compact scanning devices, and developing advanced camera modules for smartphones and augmented reality gadgets. With revenue expected to grow fourfold by 2027, MetaOptics is transforming cutting-edge research into practical technology that can revolutionise imaging across multiple industries.





The Advanced Technology Research Council (ATRC) drives Abu Dhabi's R&D agenda through entities like TII, its applied research arm advancing science and technology.

Open-Source Gen AI Made in the UAE with a Global Mission

Falcon is a suite of open-source generative artificial intelligence (AI) language models developed under Abu Dhabi's Advanced Technology Research Council (ATRC) by the Technology Innovation Institute (TII). Falcon is the Middle East region's most powerful AI model, featuring advanced multilingual and multimodal capabilities that enable transparent, adaptable, and locally relevant AI solutions.

Innovation

Falcon models are trained on high-quality, curated datasets and support tasks such as content generation, summarisation, and translation. Innovations include Falcon Edge, Falcon H-1, and Falcon Arabic. Falcon Edge runs efficiently on local devices with limited resources. Falcon H-1 features a hybrid Transformer-Mamba architecture with strong multilingual support. Falcon Arabic is tailored to Modern Standard Arabic and regional dialects.

Impact Delivered

Falcon models have been downloaded over 55 million times, accelerating innovation across various sectors, including education, customer service, and scientific research. By providing high-performance AI models without restrictive licenses, Falcon enhances innovation, inclusivity, and digital sovereignty, particularly benefiting regions with historically limited access to advanced AI.



www.atrc.gov.ae

Falcon LLM

Pioneering the Next Generation of
Language Models

ELDORADO

Reference in Research, Development and Innovation in Brazil, ELDORADO RTO has 26 years of experience in creating innovative technologies and solutions for companies and society.

Stainless steel/copper oxide nanoparticles based biosensor for glucose detection

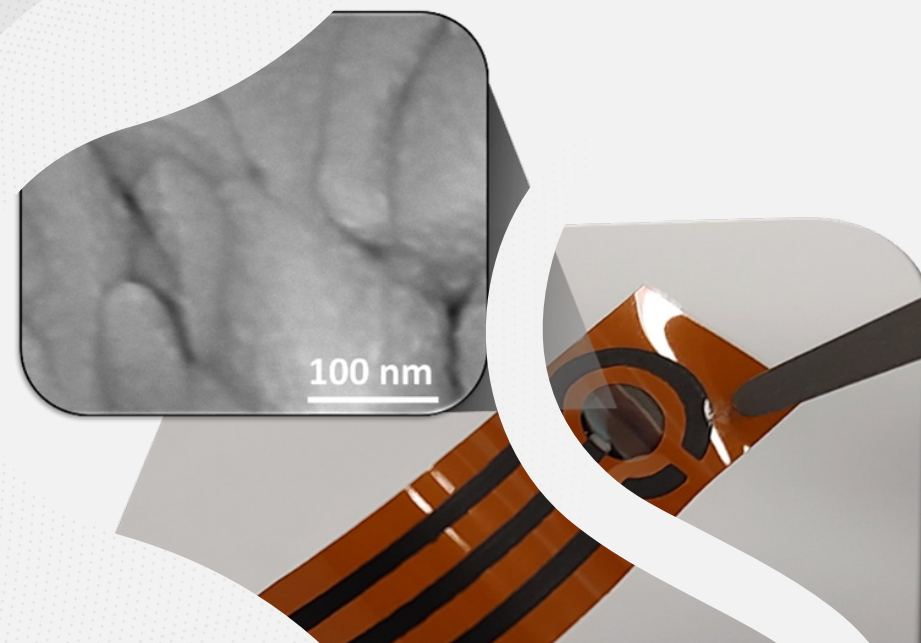
Diabetes is a severe and prevalent disease, which is also a significant risk factor for a multitude of cardiovascular problems, representing a leading cause of disability and mortality worldwide. Blood glucose monitoring is a fundamental procedure in healthcare, serving as a cornerstone for the investigation/management of diabetic patients. In this context, the search for cost-effective and reusable materials for glucose sensors has become one of the main objectives and challenges in the field of materials engineering.

Innovation

ELDORADO developed and patented a cost-effective and scalable fabrication process for a non-enzymatic flexible and reusable glucose sensor based on a stainless steel/copper oxide nanoparticles hybrid structure, utilising DC sputtering, thermal oxidation, and screen printing techniques. The relatively high sensitivity and a large linear response region for glucose of fabricated sensor permit its use for applications in lab-on-chip as well as in wearable devices.

Impact Delivered

The employment of polyimide as a durable and biocompatible substrate, stainless steel as a mechanically stable and aggressive-environment-resistant conducting layer, and copper(II) oxide nanoparticles as a selective and highly sensitive-to-glucose element, allows for applying this biosensor as a low-cost alternative to expensive gold or unstable graphene-based structures for glucose sensing in the medical, food, and agriculture industries, attending World Health Organisation ASSURED criteria for broad accessibility.





ITRI is a world-leading applied technology research institute with more than 6,500 outstanding employees. Its mission is to drive industrial development, create economic value, and enhance social well-being through technology R&D.

Smart Aqua Leak Finder for Underground Pipelines

Water scarcity impacts billions of people worldwide, with underground pipeline leaks being a major contributor. ITRI's Smart Aqua Leak Finder offers a cutting-edge solution, integrating AI-powered acoustic sensing with GPS mapping to detect leaks in seconds and with industry-leading accuracy. This portable device accelerates inspections, shortens repair times, reduces water loss, and enhances operational efficiency for utilities.

Innovation

The Smart Aqua Leak Finder integrates vibration analysis, acoustic signature comparison, noise separation, and advanced AI algorithms. Therefore, it can successfully identify continuous sound signals generated by pressure differentials during leaks in underground pipelines. With 5G and IoT connectivity, it delivers real-time mobile results and supports various pipe types. The AI can detect leaks within 3 seconds at 98% accuracy—far surpassing traditional manual methods, which average 90% and require significantly more time.

Impact Delivered

The Smart Aqua Leak Finder effectively addresses systemic leakage in urban water networks. The technology has been deployed in Taiwan and has contributed to saving a total of 52 million tons of water annually—representing over 13% of total leakage. This non-invasive solution minimises unnecessary excavation, preserves aging or historically valuable infrastructure, and offers global potential for smart water management in combating water scarcity.



www.itri.org.tw

NST / KIST

The National Research Council of Science and Technology (NST) supports and fosters 23 government-funded research institutes of Korea in the field of science and technology, including KIST.

The Korea Institute of Science and Technology (KIST) is the first Korean government-funded research institute and plays a significant role in the multidisciplinary scientific and technological areas.

Making Clean Hydrogen More Reliable with Special Carbon Material

Carbon materials have long been avoided in alkaline water electrolysis (AEMWE) due to their poor corrosion resistance under oxygen evolution conditions. This study overcomes that limitation by introducing a novel approach using hydrophobic, highly crystalline carbon (HCC) to support low-cost transition metal catalysts, dramatically enhancing both durability and performance in electrolysis.

Innovation

Researchers developed a low-cost, scalable OER electrocatalyst by integrating Fe-Ni-Co layered double hydroxide (FNC/LDH) on HCC via a simple room-temperature synthesis. The unique combination of hydrophobic carbon support and face-to-face LDH anchoring improves water and gas diffusion, reduces oxygen bubble accumulation, and enhances catalyst stability. This breakthrough enables the successful use of carbon in harsh alkaline electrolysis conditions, achieving world-class performance (10.29 A/cm² at 2.0 V) and long-term stability (over 520 hours at 1.0 A/cm²).

Impact Delivered

The FNC/HCC catalyst offers superior electrochemical activity and durability compared to commercial IrO₂-based alternatives, while significantly lowering material cost and extending device lifespan. This innovation promises to boost the viability of green hydrogen production, contributing to carbon neutrality and sustainable industrial transition. It also lays the groundwork for new business models in energy technology and supports global environmental goals.



nst National Research Council
of Science & Technology
www.nst.re.kr

KIST Korea Institute of
Science and Technology
www.kist.re.kr



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