

2025

ANNUAL REPORT

of the Centre for Research and Technology Hellas



CERTH
CENTRE
FOR RESEARCH
& TECHNOLOGY HELLAS

2025

Annual Report of the Centre for Research
and Technology Hellas



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**ΕΘΝΙΚΟ ΚΕΝΤΡΟ
ΚΑΙ ΤΕΧΝΟΛΟΓΙΚΗΣ ΕΡΕΥΝΑΣ
ΑΝΑΠΤΥΞΗΣ**





Foreword by the President

2025 was a year of intense transformation worldwide. Geopolitical realignments and the rapid advance of artificial intelligence - which is already reshaping the economy and the labour market - combined with the still-uncertain pace of its uptake by businesses and institutions, make strengthening research and cultivating advanced digital skills a critical strategic priority.

At the same time, the pressing challenges of the climate crisis, with the ever-increasing frequency of extreme weather events, have made the role of technological research absolutely decisive for developing sustainable and resilient solutions.


Within this complex and dynamic global environment, CERTH - which in 2025 marked 25 years since its establishment - was called upon to further reinforce its role as a hub for the production of knowledge, innovation and reliable solutions for society and the economy, and it did so. Our mission is not confined to scientific excellence; it extends to systematically bridging research with the country's real needs, contributing substantially to accelerating the digital, green and just transition.

Having focused strategically on developing our research infrastructure under the "CERTH 2.0" programme, we were particularly pleased to see the completion and launch of the AI Nucleus facility in 2025, - an initiative that aspires to become a hub of innovative services for optimising production processes, responding to the demands of the 4th Industrial Revolution. By the summer of 2026, CERTH will have an additional 10,760 m² available for its research staff, while two of its existing buildings will undergo energy upgrades that will significantly reduce energy consumption and operating costs, improving both their environmental performance and the quality of working conditions for employees.

Another significant milestone was the launch of the Interactive Park of Green Technologies for Islands in Halki, under the "NISOS" initiative - an open space of knowledge and technology that connects research with society and showcases the dynamism of the Greek scientific and business community.

In the same spirit, we were especially pleased by the foundation laying of the Green Hydrogen Technologies Park of the Hydrogen Innovation Hub (H2-HUB), at CERTH's premises in Ptolemaida, which creates the conditions for strengthening research and innovation in the operation of innovative green hydrogen systems in our country.

The development of new infrastructure at CERTH, alongside the upgrading of existing facilities, is linked not only to the physical expansion of CERTH and, consequently, of its research activity, but also to improving working conditions for its employees and reducing its environmental footprint. Beyond this, it symbolises a dynamic period of renewal for the Research Centre, with enhanced and new research directions and the planning of ambitious projects - a period in which it aspires to become a point of reference for development and innovation in Northern Greece and beyond, with a spirit of outward orientation and partnerships with the business world and the wider ecosystem.



Once again, this year, by maintaining high revenue levels - it is worth noting that 2025 was the third consecutive year in which the Centre's annual turnover exceeded €60 million - we confirm our steady growth trajectory and the continuous strengthening of our footprint within the research and productive ecosystem.


We are proud that a significant share of the Centre's revenue came from our collaboration with industry, reflecting the high quality of our services and the level of trust we have built with our partners on the basis of shared goals and values that genuinely shape our cooperation. Our performance in attracting funding under highly competitive terms was also outstanding. In 2025 the Centre participated in 133 European research projects, in many of them as consortium coordinator, contributing substantially to addressing contemporary challenges. At the same time, the impact of the Centre's scientific work continued its upward course for yet another year, with an increase of around 28% compared with the previous year, as reflected in the rise in heterocitations.

CERTH's Technology Transfer Office moved along the same dynamic trajectory during 2025. New patents were added to the Centre's portfolio and new agreements were concluded with industry for their further exploitation. At the same time, innovative entrepreneurship was strengthened through meetings with venture-capital teams. The activation of the SPIRA+ Network, coordinated by CERTH, laid the foundations for expanded technology transfer services.

Our human capital played a decisive role in this continuous growth. Our more than 1,600 highly qualified scientists, with admirable dedication and systematic effort, successfully met the increased organisational, administrative and research demands, ensuring the steady and smooth operation of the Centre. Our aim remains not only to maintain but to further strengthen CERTH's position as one of the best and most trusted employers in Greece, creating an environment that fosters scientific advancement, collaboration and innovation, as well as meritocracy and quality working conditions. To this end, our development plans and the new infrastructure being delivered substantially reinforce our vision, while an important step was the establishment of a Human Resources (HR) Office in 2025, aimed at shaping a modern, fair and inclusive working environment that supports the growth and collaboration of employees.

Remaining committed to our vision of continuous business growth, we saw many of the Centre's spin-off companies develop even stronger economic activity, win distinctions and form partnerships, expanding their horizons into international markets.

Our priority also remains to further strengthen CERTH's outward orientation and international presence - through new collaborations, the broadening of our participation in European and international networks, and our physical expansion with new branches and activities in more regions of the country, with the aim of supporting the smart specialisation of each region.



CERTH's goal is for every initiative that matures within it not to remain at the level of planning or research output, but to be transformed into a living lever of progress for society. In this way, CERTH's positive social impact is not a parallel strand of our work, but the very essence of our mission. It is the reason we work every day, and we will continue to do so with consistency and dedication.

I warmly thank you for your continued trust in and support of CERTH.

Yours sincerely,
Chairman of the Board of CERTH
Dr. Evangelos Bekiaris

A Significant Milestone

2025 was the year in which the Centre for Research and Technology Hellas completed 25 years of operation, marking a quarter-century of continuous contribution to research, innovation and technological development at national, European and international level.

Under the motto “We advance knowledge - we shape the future,” a special celebration was held that proved a distinctive moment for CERTH, highlighting its enduring role in connecting scientific knowledge with the needs of society and the real economy.

As part of the celebration, CERTH carried out a series of activities in four municipalities of Thessaloniki, with the aim of directly engaging the local community and disseminating research and innovation to the wider public.



Activities and innovation in the municipalities of Thessaloniki.

In the Municipalities of Thessaloniki, Thermi, Kordelio-Evosmos and Pylaia-Chortiatis, as well as at the Vocational High School (EPAL) of Stavroupoli, visitors and students had the opportunity to discover at first hand innovative applications and research achievements of CERTH, through interactive presentations and experiential activities that highlighted the role of research in everyday life and in sustainable development.

The anniversary activities culminated in a two-day conference on 11 and 12 December 2025, held under the auspices of H.E. the President of the Hellenic Republic, Mr. Konstantinos An. Tasoulas, which included thematic discussion panels and keynote addresses by distinguished representatives of the scientific, institutional and business communities.

In an atmosphere of celebration and creative interaction, representatives of the State, industry and the academic, research and business communities took part in a substantive and fruitful dialogue and exchange of views. The focus was on the policies

and tools that strengthen growth. Particular emphasis was placed on critical cutting-edge fields shaping the future - such as artificial intelligence, the environment, the life sciences, clean and autonomous transport, and the bioeconomy - highlighting the role of research as a catalyst for sustainable development.



The Chairman of the Board of Directors of CERTH, Dr. Evangelos Bekiaris, during his address, rich in information on the Centre's course and achievements over the years, and the first Chairman of the Board and founding member of CERTH, Professor Iacovos Vasalos, during his speech, rich in historical references and personal testimony.

The discussions were complemented by inspiring addresses from CERTH members who made a decisive contribution to shaping and developing the Research Centre. Speakers included, among others, the first President of CERTH and founding member Professor Iacovos Vasalos, as well as the President of the NCRTI, Mr. Georgios Nounesis, and the Vice-President of the NCRTI, Mr. Georgios Doukidis.



The President of the NCRTI, Mr Georgios Nounesis, and the Vice-President of the NCRTI, Mr Georgios Doukidis, during their presentations.

A special moment of the event was the honorary recognition of the founding members and of the people who have stood by the Centre over the years, actively supporting its vision and course. Professors Iacovos Vasalos, the first President of CERTH's Board of



The people behind the dialogue: the participants in the panels of CERTH's 25th-anniversary celebration.



The founders and "fathers" of CERTH with the current President of the Board, Dr. Evangelos Bekiaris.



Professors Iacovos Vasalos, Georgios Giannopoulos and Athanasios Tsaftaris.

Directors (2000–2005); Georgios Giannopoulos, founder and first Director of HIT and Vice-President of CERTH (2010–2011); and Athanasios Tsaftaris were honoured for their decisive contribution to shaping, consolidating and promoting the principles and values that to this day form the core of CERTH's mission and operation.

Long-serving employees of the Centre, whose dedication supported its growth and stability, were likewise honoured.

During the event, the new AI Nucleus facility of the Information Technologies Institute (ITI) was inaugurated within Technopolis. It aspires to become a hub for the provision of innovative services to optimise production lines, responding to the contemporary demands of the 4th Industrial Revolution.



The inauguration of the AI Nucleus facility, performed by the Deputy Minister of Development, Mr. Stavros Kalafatis.



Award ceremony for the students.

Student competitions held a special place, with the participation of primary, lower-secondary and upper-secondary school pupils. The competitions showcased children’s creativity, imagination and interest in science, technology and innovation, strengthening the connection between research and the new generation.

The students who distinguished themselves were honoured with gifts as part of a special celebration of knowledge, creativity and inspiration. The event highlighted the importance of cultivating scientific thinking from an early age, as well as CERTH’s enduring commitment to disseminating knowledge and science in society. The competition drew the participation of 42 schools, with 69 individual and 27 group entries, confirming the strong interest of the student community in research and innovation.

The schools ultimately awarded were the 2nd School of Oraiokastro, the Primary School of Patrída – Veroia, the 31st Junior High School of Thessaloniki, the Junior High School of Axioupoli – Kilkis, the Unified Special Vocational Junior/Senior High School (INAA) of Pefka, the Onassis Public General Senior High School of Xanthi, the 7th General Senior High School of Kalamaria, the 2nd General Senior High School of Stavroupoli and the 18th General Senior High School of Thessaloniki.

Institutional Developments and Public Presence

2025 was marked by significant institutional developments and a strengthening of the Centre’s public presence. The assumption of duties by the new administration, the targeted contacts with institutional and scientific bodies, and the high-level visits to CERTH’s premises all contributed to shaping a dynamic framework of outward orientation and collaboration.

These initiatives reinforced the Centre’s institutional identity, consolidated its position within the national and international research and innovation ecosystem and created new prospects for strategic growth.

Dr. Evangelos Bekiaris assumes the duties of President of CERTH

Dr Evangelos Bekiaris assumed the duties of Chairman of the Board of Directors of the Centre for Research and Technology Hellas (CERTH) on Friday, 25 April 2025. Dr. Bekiaris was elected Chairman of CERTH by an independent seven-member committee, composed of distinguished Greek scientists and academics from Greece and abroad. The committee was appointed by the National Council for Research, Technology and Innovation (NCRTI) of the General Secretariat for Research and Innovation (GSRI) of the Ministry of Development.



Left: Dr Evangelos Bekiaris assumed the duties of President of the Centre for Research and Technology Hellas (CERTH) on Friday, 25 April 2025.

Right: With a sense of responsibility and in a climate of respect, duties were handed over by the outgoing President, Mr Tzouvaras, and assumed by the Vice-President, Mr Bekiaris.

With a sense of responsibility and in an atmosphere of respect and mutual commitment to strengthening CERTH's mission and shaping a strong innovation ecosystem, duties were handed over by the outgoing Chairman of the Board, Dr. Tzouvaras, and assumed by the then Vice-Chairman of the Board, Dr. Bekiaris.

The new Chairman's vision is to maintain CERTH's scientific excellence across all of its fields of activity and to contribute, through the Research Centre, to building a sustainable future by providing innovative technological solutions for society and the economy, with parallel emphasis on improving the working conditions of the Centre's staff.

In this context, Dr Maria Gkemou was also appointed Director General of the Central Directorate. On assuming her duties, she undertook a comprehensive overhaul of the Central Directorate's organisational structure, with the aim of modernising its administrative structures, enhancing its operational effectiveness and better supporting CERTH's research work.

Visit to CERTH by the EU Commissioner for Sustainable Transport and Tourism, Mr. Apostolos Tzitzikostas



Briefing at CERTH's Hellenic Institute of Transport (HIT).

CERTH was the first stop for Mr. Apostolos Tzitzikostas in his capacity as EU Commissioner for Sustainable Transport and Tourism. Mr. Tzitzikostas was given a tour of CERTH's Hellenic Institute of Transport (HIT) and was subsequently briefed on the work of the Research Centre as a whole.

At the end of the visit, he stressed that he had chosen CERTH as his first stop in Greece as Commissioner because of its exemplary way of operating.

Defining innovation as the key to European competitiveness, Mr. Tzitzikostas underlined the significant role of CERTH | HIT in enabling Europe to play a leading role in transport and the automotive industry.

Assembly of Presidents of Research Centres at the Centre for Research and Technology Hellas: Institutional Dialogue and Priorities for Research in 2025

On 7 May 2025, the Assembly of Presidents of Research Centres and Technology Bodies was held at the Centre for Research and Technology Hellas (CERTH), coordinated by the Vice-Chairman and presiding member of the Board, Dr. Evangelos Bekiaris.



The Assembly was attended by representatives of all 13 of the country's research centres (in person and remotely), as well as by the Deputy Minister of Development, Stavros Kalafatis.

The meeting discussed critical issues concerning the institutional and administrative framework, as well as matters relating to research personnel. The Deputy Minister presented the government's priorities for research and asked the Presidents to rank three immediate priorities. The Assembly demonstrated a climate of convergence and substantive dialogue on strengthening the research ecosystem.

Visit to CERTH by the Deputy Minister of Development and presentation of the CERTH 2.0 Programme

The Deputy Minister of Development responsible for Research and Innovation, Mr. Stavros Kalafatis, visited CERTH in May 2025. There, the Centre's development planning and research activity, its ties with domestic and international industry, and the infrastructure and equipment of the CERTH 2.0 programme were presented.



Left: During the reception. Right: With the members of CERTH's Board of Directors.



During the briefing of the Deputy Minister of Development by members of CERTH's Board of Directors.

The discussion highlighted the key legislative proposals of the Assembly of Presidents of Research Centres and Technology Bodies, with a view to immediate interventions. The Deputy Minister described CERTH as a model for the country's new productive model and toured the Centre's technology exhibits.

Address at the joint session of the Special Standing Committee on Research and Technology and the Standing Committee on Production and Trade of the Hellenic Parliament

In May 2025, the Chairman of CERTH's Board of Directors, Dr. Evangelos Bekiaris, attended the joint session of the Special Standing Committee on Research and Technology and the Standing Committee on Production and Trade of the Hellenic Parliament, on the theme "Research Centres Innovate."



Particular emphasis was placed on the key proposals developed for the institutional strengthening of the research ecosystem through targeted legislative measures, whose necessity the President of CERTH's Board explained to the members of parliament present.

In his presentation, he highlighted the Centre’s initiatives in innovation and technology transfer, while at the same time, as presiding officer of the Assembly of Research Centres during that period, he presented the overall picture of excellence across all the Research Centres.

A particularly encouraging element was the recognition of the importance of these proposals by the members of parliament, as well as the shared understanding of the need for their immediate support by the State.

“Artificial Intelligence and Health Data” event and strategic partnership between CERTH | INAB and Cisco

On 2 June 2025, at CERTH’s premises in Thessaloniki, the event “Paving the Way: Artificial Intelligence and Health Data” was held. During the event, a Memorandum of Understanding was signed between CERTH | INAB and Cisco, marking a strategic partnership in the fields of artificial intelligence, innovation and the use of health data.



During the event, addresses were delivered by representatives of the State, including the Minister of Health, Mr Adonis Georgiadis, with an online greeting, as well as the Deputy Minister of Development, Mr Stavros Kalafatis, and the Deputy Minister of Health, Mr Dimitris Vartzopoulos.

The event highlighted the strategic role of Artificial Intelligence in shaping the future of healthcare, with emphasis on data security and interoperability, as well as on the use of advanced computing infrastructure to support clinical studies and evidence-based decision-making.

Working meeting on linking research with entrepreneurship

Also in May 2025, a collaboration meeting took place between the Chairman of CERTH's Board of Directors, Dr. Evangelos Bekiaris, and the President of the Greek Exporters Association (SEVE) and Managing Director of Diopas S.A., Mr. Simeon Diamantidis, head of a vertically integrated production unit specialising in the manufacture and trade of nets.

The meeting focused on three main axes: SEVE's participation in the new Entrepreneurship and Technology Transfer Council of the Centre for Research and Technology Hellas; the formation of a specialised research team for innovative solutions to protect the marine environment; and the donation by Diopas S.A. to CERTH's Interactive Park of Green Technologies for Islands of three cutting-edge technology exhibits with applications in protecting marine life and in converting atmospheric humidity into irrigation water.



At the premises of Diopas S.A. during Mr Bekiaris's visit.

Upgrade of the Rhodes branch into a technology development hub and living lab for smart, environmentally neutral islands



During the meeting of CERTH's Board of Directors and members of CERTH's community in Rhodes

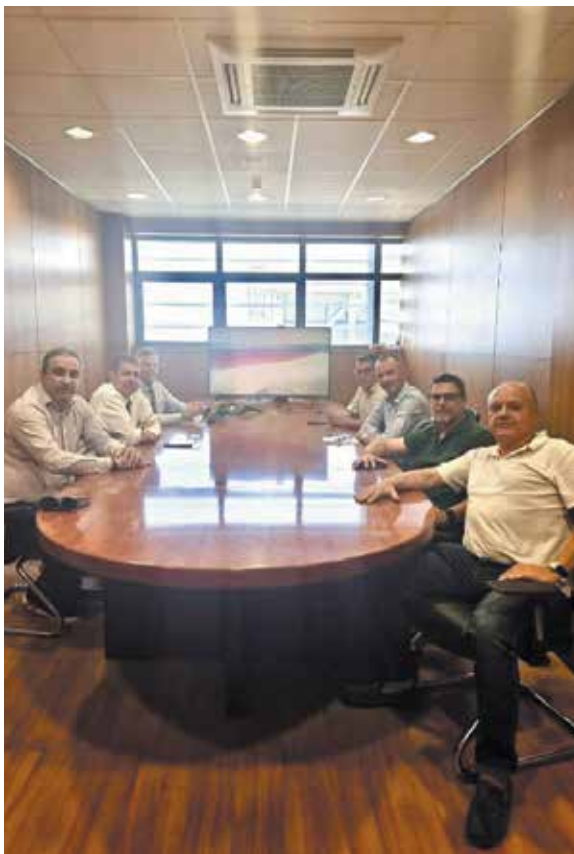
Recognising the key role of regional development and aiming to substantially strengthen its local presence, in July 2025 CERTH upgraded the Rhodes branch of CERTH | HIT into a Technology Development Hub and a Living Lab for the whole of CERTH dedicated to Smart and Environmentally Neutral Islands.

In this way, the conditions are created for the development of pioneering activities in the Region of the South Aegean, in critical areas such as clean and renewable energy, “smart” and environmentally neutral infrastructure, tourism and transport, the circular economy, agri-technology, Industry 4.0 and health.

Through this strategic direction, the Centre strengthens its physical and scientific presence in the island region, underlining the decisive role of Research and Innovation in achieving sustainable and resilient development.

Visit to CERTH by the Secretary General of the Ministry of Digital Governance, Professor Dimosthenis Anagnostopoulos

In September 2025, the Secretary General of the Ministry of Digital Governance, Professor Dimosthenis Anagnostopoulos, visited CERTH's Information Technologies Institute, where he had the opportunity to learn about mature technologies that can be put to immediate use for the benefit of citizens and the Ministry, with emphasis on Artificial Intelligence applications.



During the visit to CERTH's Information Technologies Institute.

Mr. Anagnostopoulos was presented with representative applications, such as the robotic system for the automatic digitisation of documents for use at the National Cadastre; the application developed in collaboration with the Hellenic Institute of Transport (HIT) for analysing the accessibility of public websites (which the Ministry has already used in the past); and the service co-developed by ITI and HIT for the Ministry of Infrastructure and Transport, enabling practical driving tests to be conducted in an objective and transparent manner - with the Secretary General expressing his satisfaction at the Centre's high level of readiness.

CERTH 2.0: Connecting research with the needs of society and the region - Visit by the Deputy Minister of Development, Mr. Stavros Kalafatis

In September 2025, the Deputy Minister of Development, Stavros Kalafatis, visited CERTH to be briefed on the progress of the CERTH 2.0 project, as well as on the institutional and funding challenges associated with the timely development of new, modern research infrastructure.

Particular emphasis was placed on the strategic use of the Centre's mature technologies for the benefit of Thessaloniki and the wider region of Macedonia, as well as on the potential to implement targeted actions in collaboration with municipalities, chambers of commerce, sports organisations, schools, hospitals and other social bodies, strengthening the link between research and local needs and the region's development momentum.



The Deputy Minister with the members of CERTH's Board of Directors.

Visit by the Deputy Minister of Development to the Ptolemaida branch - Emphasis on the Hydrogen Hub and the Development Transition



At the premises of CERTH's branch in Ptolemaida.

During the visit, the Deputy Minister was presented with CERTH's technological priorities in the area and the branch's key achievements, with emphasis on clean energy and environmental solutions of applied innovation, with direct social and developmental impact.

Later in September, the Deputy Minister of Development, Mr. Stavros Kalafatis, visited CERTH's Ptolemaida branch. During the meeting, the key technological priorities and infrastructure projects under way in the area were presented, spearheaded by the Ptolemaida Hydrogen Hub.

Particular emphasis was placed on the contribution of these projects - with a total budget of over €30 million - to the energy transition of Western Macedonia, the strengthening of local entrepreneurship and the creation of new jobs, confirming the branch's role as a pillar of innovation and sustainable development in the region of Western Macedonia. There are already 43 jobs in Ptolemaida today, across 22,307 m² of infrastructure.

Briefing of the Secretary General on the Progress of CERTH 2.0

On 5 September, the Secretary General for Research and Innovation, Mr. Tasos Gaitanis, visited CERTH and was briefed on the progress of the CERTH 2.0 project by the Chairman of the Board of Directors and the Directors of the institutes.



Left: At the conference centre under construction — the Remote Collaboration and Knowledge Sharing Facility, which will serve as a showcase for the research conducted at CERTH and its results, and the Smart AgriFood Pilot Facility (GreenHouse), which will host research infrastructure for the biological and biomedical sciences.

Right: The Secretary General for Research and Innovation together with CERTH's Board of Directors.

During the visit, the new and upgraded research facilities were presented, including the AI Nucleus building of the Information Technologies Institute (ITI), the extensions of the Institute of Applied Biosciences (INAB), the photovoltaic park for energy upgrading, and the new collaboration and agri-food research facilities. In addition, the progress of the energy-upgrade works at the Hellenic Institute of Transport (HIT) was presented.

CERTH's research at TIF: Innovations with applications in energy, biotechnology and transport

CERTH took part once again this year in the Thessaloniki International Fair, presenting at its stand innovative technologies and research results with applications in energy, biotechnology and smart transport. Among the demonstrations presented to the public were technologies for capturing and electrochemically converting CO₂ into useful chemical products, the real-time observation of genetically modified cells, a traffic-monitoring system, and an interactive artificial-intelligence application that allowed visitors to "converse" with the ancient Greek philosopher Socrates.



Innovations at the Thessaloniki International Fair by CERTH.

CERTH's stand was visited by, among others, the Minister of Development, Mr. Takis Theodorikakos, and the Secretary General for Research and Innovation, Mr. Tasos Gaitanis, who were briefed on the Centre's research activities and the technological solutions it develops, confirming its active role in promoting innovation and technology transfer for the economy and society.



The Minister of Development, Mr. Takis Theodorikakos, and the Secretary General for Research and Innovation, Mr. Tasos Gaitanis, at CERTH's stand at TIF.

CERTH: Strengthening Innovation in Dialogue with the Business Community



During the event, CERTH's branches and new research buildings were also presented, creating a strong ecosystem of knowledge and innovation aimed at multiplying collaborations and strengthening external engagement.

In September 2025, Dr. Evangelos Bekiaris highlighted CERTH's role as a catalyst for technology transfer and the strengthening of innovation in the business community, at an event of the Central Union of Chambers of Commerce of Greece.

In his remarks, particular emphasis was placed on the new Innovation Supervisory Council and on the digital point of contact that facilitates collaboration with industry, as well as on the presentation of the Centre's branches and new research infrastructure, which strengthen the knowledge and innovation ecosystem.

The Deputy Minister of Development, Mr. Stavros Kalafatis, underlined the strategic importance of research centres' external engagement and affirmed CERTH's decisive role in harnessing research for the benefit of the economy and society.

Meeting between CERTH and the Hellenic Center for Defence Innovation

Focusing on exploring collaborations in the fields of defence, security and dual-use technologies, representatives of the Hellenic Center for Defence Innovation visited the Centre for Research and Technology Hellas.

During the visit, the activities of the two organisations were presented and possibilities for harnessing research results were discussed, while the meeting concluded with a tour of selected research facilities and laboratories of the Centre.



Presentation of CERTH's activities and potential for collaboration with ELKAK.

Inauguration of the Interactive Park of Green Technologies for Islands in Halki

On 21 October 2025, the Interactive Park of Green Technologies for Islands was inaugurated in Halki, under the "NISOS" initiative. The inauguration was performed by the Chairman of the Board of Directors Dr. Evangelos Bekiaris, and the Mayor of Halki, Mr. Evangelos Frangakis.



The inauguration ceremony of the Interactive Park of Green Technologies.

The Park, developed by CERTH on land granted by the Municipality, operates as a centre of information and experience for green development and the sustainable transition of the islands. Through interactive exhibits and innovative applications, it demonstrates solutions for green energy, the circular economy and energy autonomy, highlighting the role of research in the green transition and the sustainable development of island regions.

CERTH at the AI Forum 2025: Research, funding and artificial-intelligence applications

The Chairman of the Board of Directors of CERTH Dr. Evangelos Bekiaris, took part in the AI Forum 2025 conference, on the panel “Defining the Greek AI Roadmap: Strategy, Opportunities and Challenges.”

In his remarks, he highlighted CERTH’s significant position in the field of artificial intelligence, noting that in the period 2021–2023 it ranked among the top five EU organisations in attracting competitive funding in the AI field.

He also presented the Centre’s research initiatives and their contribution to innovation, collaboration with industry and the development of applications of direct benefit to society.



Participation of CERTH at AI Forum 2025: Dr. Evangelos Bekiaris highlighted the Centre’s contribution to the development of AI applications with direct social and industrial impact.

Visit to CERTH by the Deputy Minister of the Interior (Macedonia-Thrace), Mr. Konstantinos Gioulekas



The Deputy Minister of the Interior, Mr. Konstantinos Gioulekas, together with the members of CERTH's Board of Directors and members of CERTH's community.

In November 2025, CERTH was visited by the Deputy Minister of the Interior (Macedonia-Thrace), Mr. Konstantinos Gioulekas.

During the working meeting that followed, the role of research and innovation in shaping modern public policy was highlighted. The possibilities for transferring know-how to the State were discussed in particular, with emphasis on the digital transformation of public administration and the development of smart services for the benefit of citizens.

At the same time, prospects were examined for further harnessing CERTH's research results to support public administration and local government, taking into account the smart-specialisation fields and the development priorities of Northern Greece.

CERTH's participation in SEVE's 50th Anniversary

As part of the activities that strengthen its institutional presence and the promotion of its research activity, CERTH took part in the anniversary event for the 50 years of the Exporters' Association of Northern Greece (SEVE).

The Chairman of CERTH's Board, Dr. Evangelos Bekiaris, accompanied by a team of colleagues, represented the organisation on Friday, 5 December 2025. CERTH's participation as a Gold Sponsor highlighted its commitment to supporting external engagement, innovation and the strategic connection of research with entrepreneurship in Northern Greece.

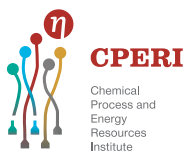
During the event, the Chairman had the opportunity to meet the new United States Ambassador to Greece, Ms. Kimberly Guilfoyle, inviting her to visit CERTH's premises. The Ambassador's response and her intention to visit in the near future underline the importance of broadening international cooperation and strengthening research networking between Greece and the United States.



Left: A brief conversation with the new United States Ambassador to Greece, Ms. Kimberly Guilfoyle.



Right: The Chairman of the Board of Directors Dr. Evangelos Bekiaris, with the President of SEVE, Mr. Symeon Diamantidis.



1. KNOWLEDGE ADVANCEMENT CENTRE

Brief Profile

The Centre for Research and Technology Hellas (CERTH) is one of the most important research centres in Greece, with an active and recognised presence in the European Research Area. With a strong social footprint and a mission focused on turning knowledge into innovative technological applications, CERTH has long shaped the conditions for a more sustainable, technologically mature and socially conscious future.

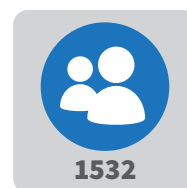
Established in March 2000 in Thessaloniki, it is a legal entity governed by private law with non-profit status supervised by the General Secretariat for Research and Innovation (GSRI) of the Ministry of Development.

Artificial intelligence, advanced robotic systems, the Internet of Things, Industry 4.0, clean energy, green hydrogen, precision medicine, the holistic health-nutrition approach, autonomous vehicles, smart cities, precision agriculture, agri-robotics and the circular economy make up the main fields in which its five Institutes operate: the Chemical Process & Energy Resources Institute (CPERI), the Information Technologies Institute (ITI), the Hellenic Institute of Transport (HIT), the Institute of Applied Biosciences (INAB) and the Institute for Bio-Economy and Agri-Technology (iBO). Together with the organisation's Central Directorate, they employ more than 1,600 people - the majority of them engineers and scientists - across 7 regions and 9 cities of the country.



In 2025, CERTH secured €64.9 million, of which 9.2% came from contracts with industry for the provision of research services, 71.8% from the Centre's participation in competitive research programmes, and just 7.9% from state funding.

At the same time, throughout 2025 CERTH remained a very significant employer of highly specialised staff, employing 1,532 people in highly specialised positions over the course of the year.



At the end of 2025, with the completion of the fifth year of the Horizon Europe funding programme, CERTH remained for yet another year in first place in Greece and 11th among Europe's leading research centres in terms of attracting funding from European competitive programmes.

Financial Overview

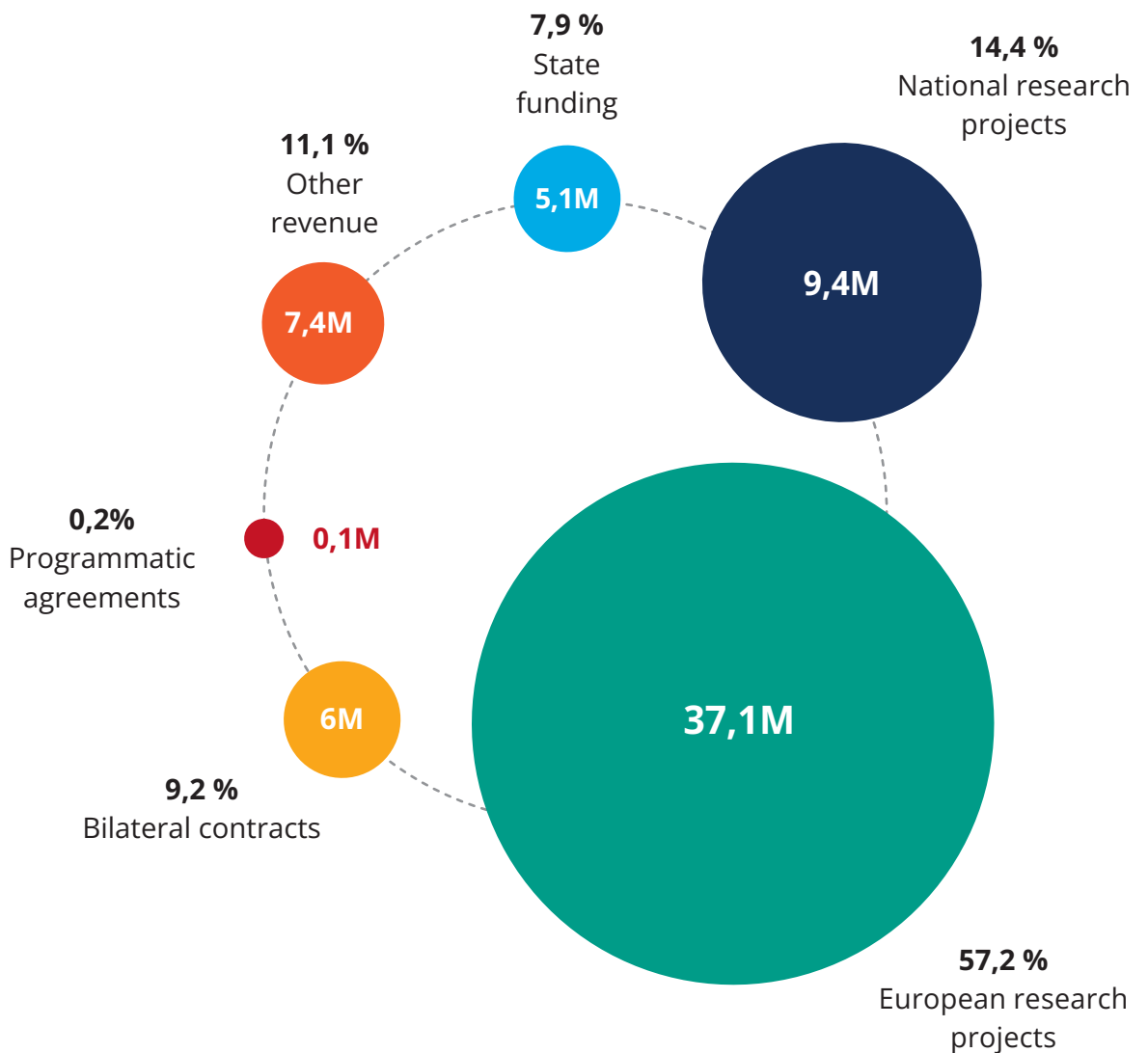
During 2025, CERTH's total revenue amounted to approximately €64.9 million.

Resources from the annual institutional state grant amounted to €5.1 million, a figure that translates to just 7.86% of its total annual revenue.

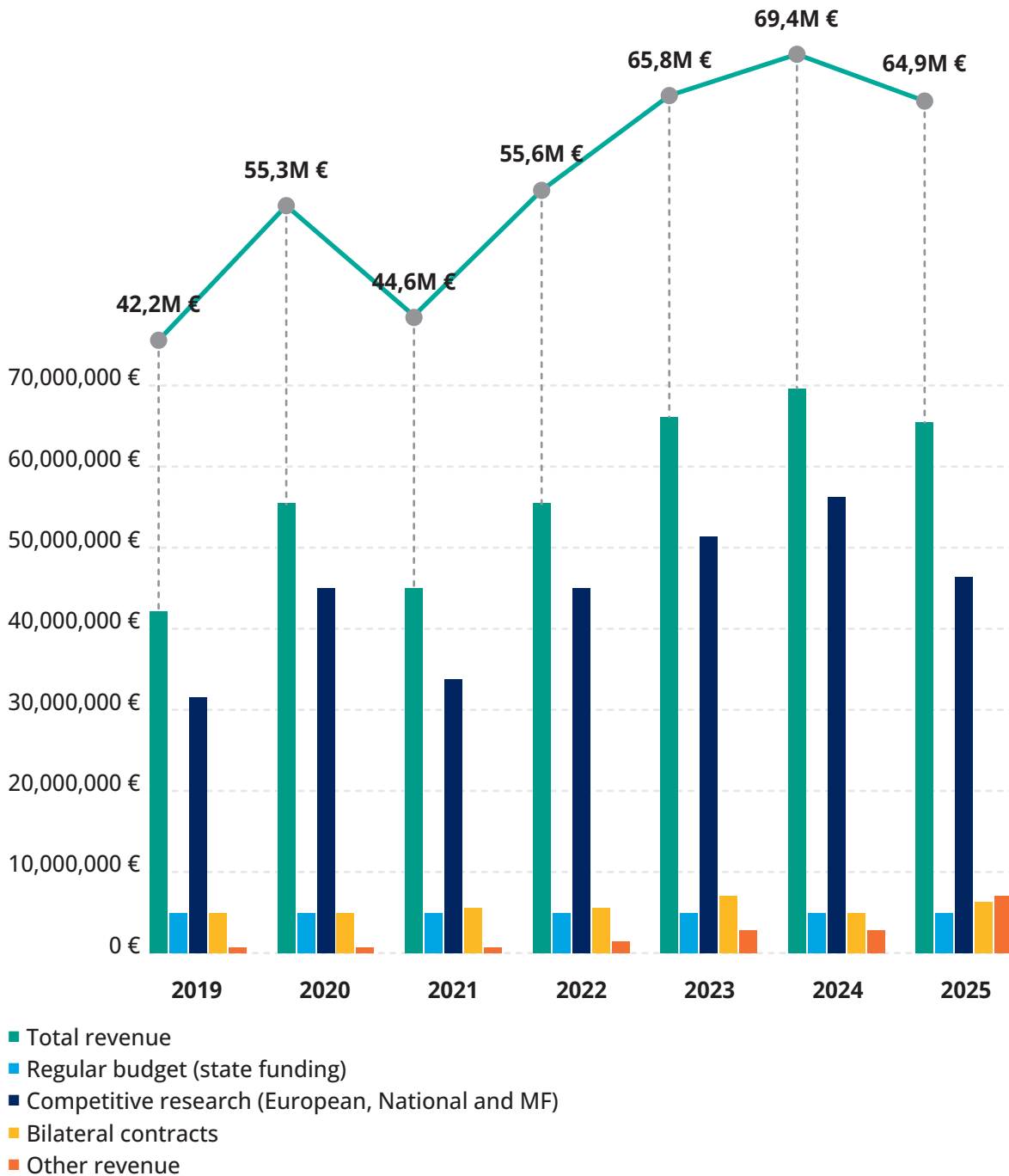
At the same time, the Research Centre secured €46.5 million from competing for national and European projects - an amount corresponding to 71.65% of its total revenue.

Specifically, €9.4 million came from national research projects funded by the General Secretariat for Research and Innovation (GSRI), an amount corresponding to 14.45% of CERTH's total revenue. From the Research Centre's participation in European competitive research grants, €37.1 million was secured, corresponding to 57.2% of its total revenue.

An equally important source of revenue for CERTH is the income it secures from bilateral service contracts with industry, businesses and the public sector. More specifically, in 2025 €6 million was secured, corresponding to 9.24% of its total cash inflows.



Finally, an amount of approximately €7.4 million came from supplementary sources of revenue. Of this, 0.15% relates to programmatic agreements, while 11.09% came from other income, such as rents, interest and donations or sponsorships.



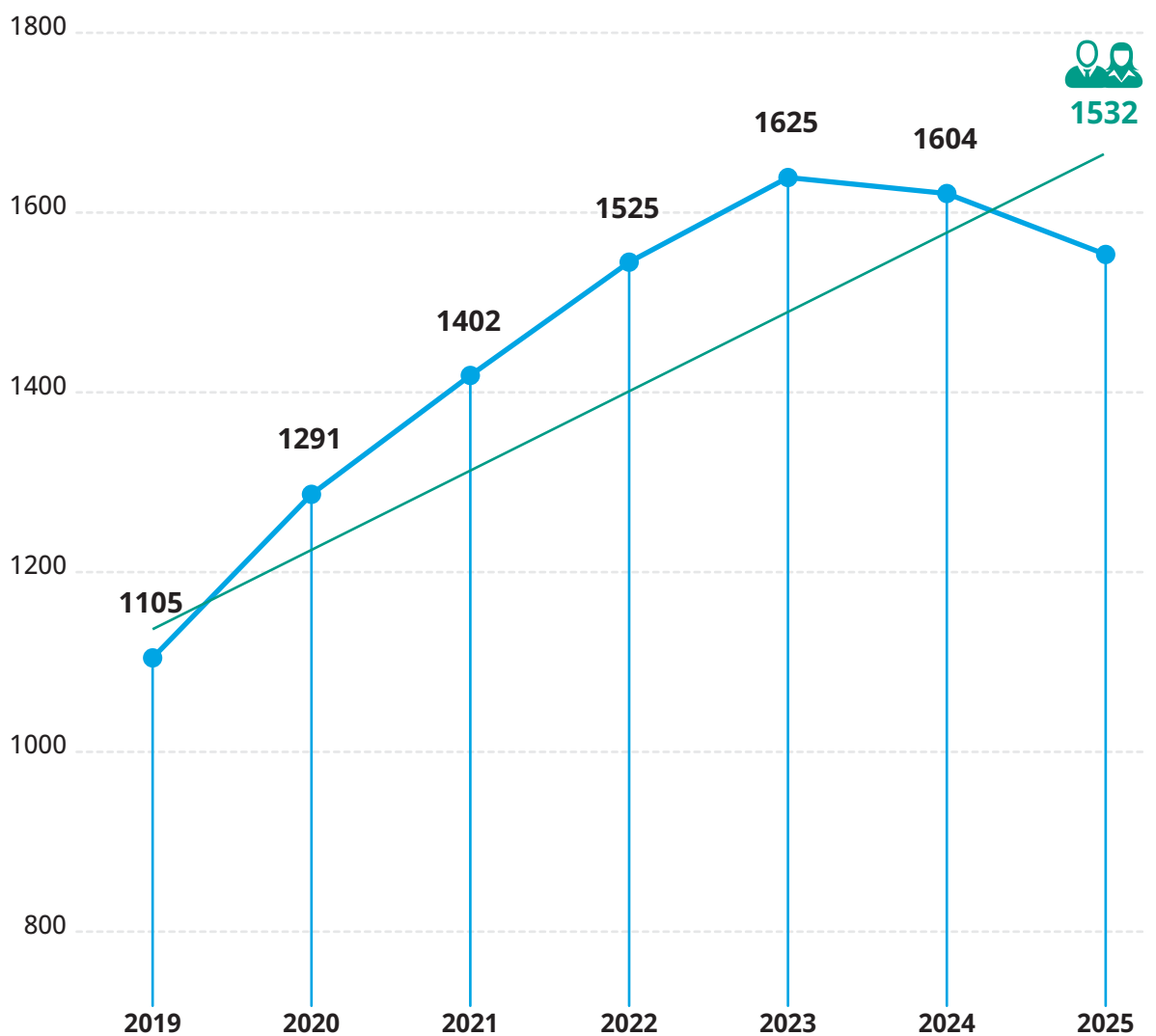
Cash inflows and depiction of the evolution of revenue over the past seven years.

Human Capital

In 2025, the number of CERTH employees decreased compared to the previous year, while remaining at a consistently high level. The total number of employees engaged during the year came to 1,532.

The age profile of the staff continues to be a comparative advantage, as 50% of employees in 2025 were aged up to 34, while around four-fifths of the staff were no older than 44.

CERTH consistently cultivates the attraction and retention of highly qualified scientific talent, fostering a modern, healthy and supportive working environment that encourages collaboration, excellence and continuous development.



Authorship and research output

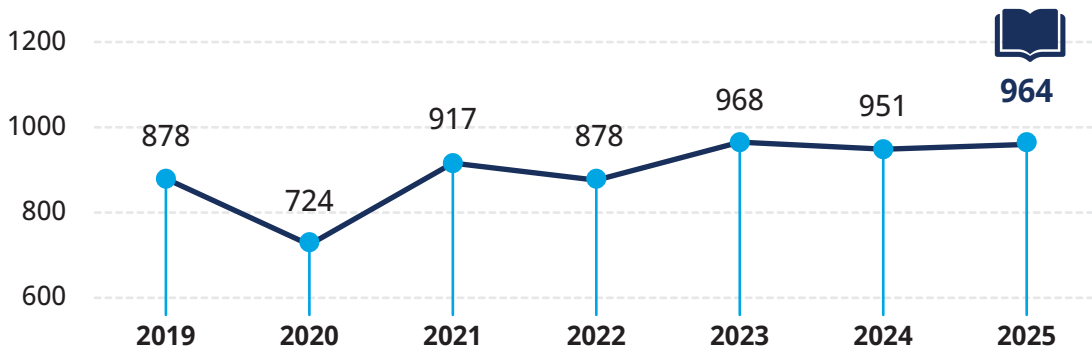
2025 confirmed the continuous growth trajectory of the Centre for Research and Technology Hellas in scientific production, with its research output reflecting a high level of quality, international outreach and originality.

During the year, a total of 964 publications were recorded, of which 408 were articles in international peer-reviewed scientific journals, 526 were publications and presentations at international conferences, 29 were chapters in edited volumes, and one was a monograph.

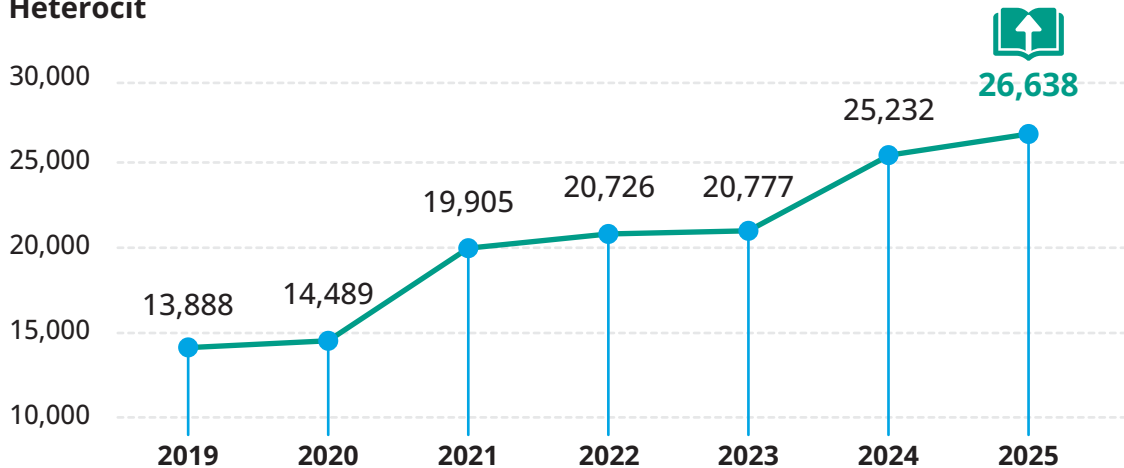
At the same time, the international impact of the Centre's research work was further strengthened, as reflected in the number of heterocitations received by its publications.

In 2025, heterocitations reached 26,638, showing an upward trend compared with previous years and confirming the Centre's contribution to the advancement of international research. Comparative figures for the past seven years are set out in the following tables.

Publications



Heterocit



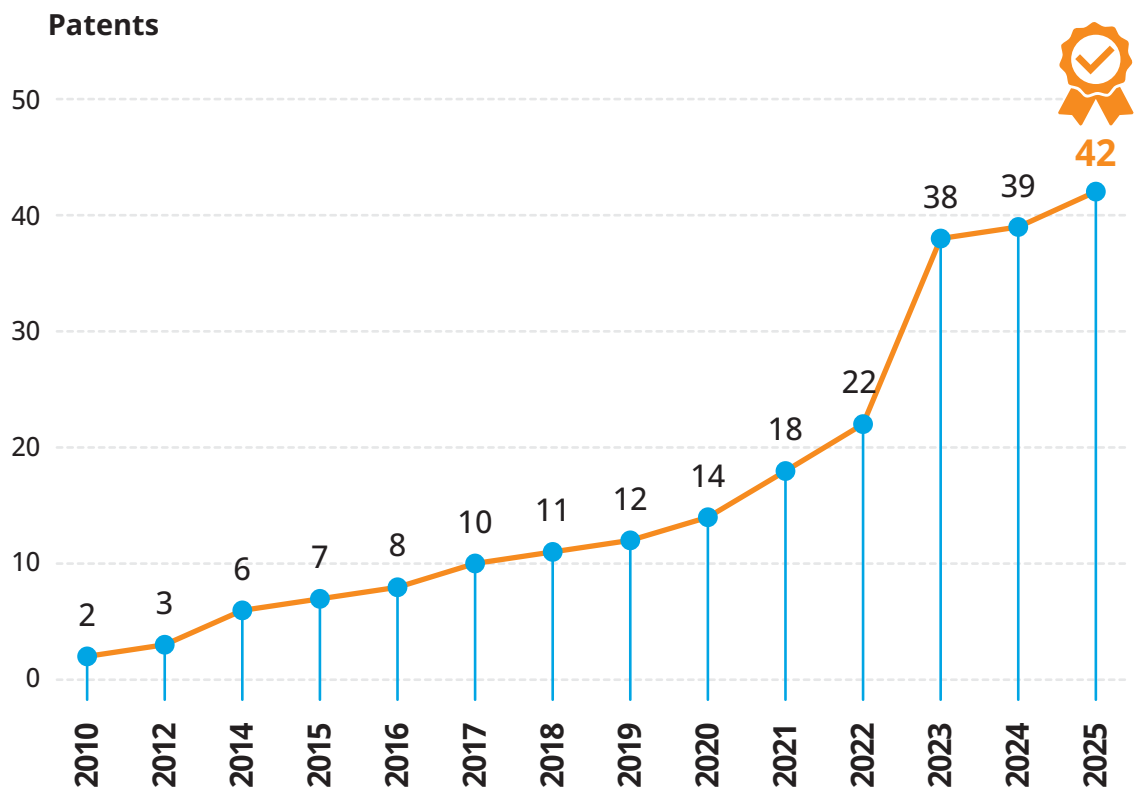
Protecting CERTH's Intellectual Property

The journey from the laboratory to the market is not a given. Between a research discovery and its social impact lies a critical step: securing industrial property, which protects the creator, attracts investment and opens the way to technology transfer.

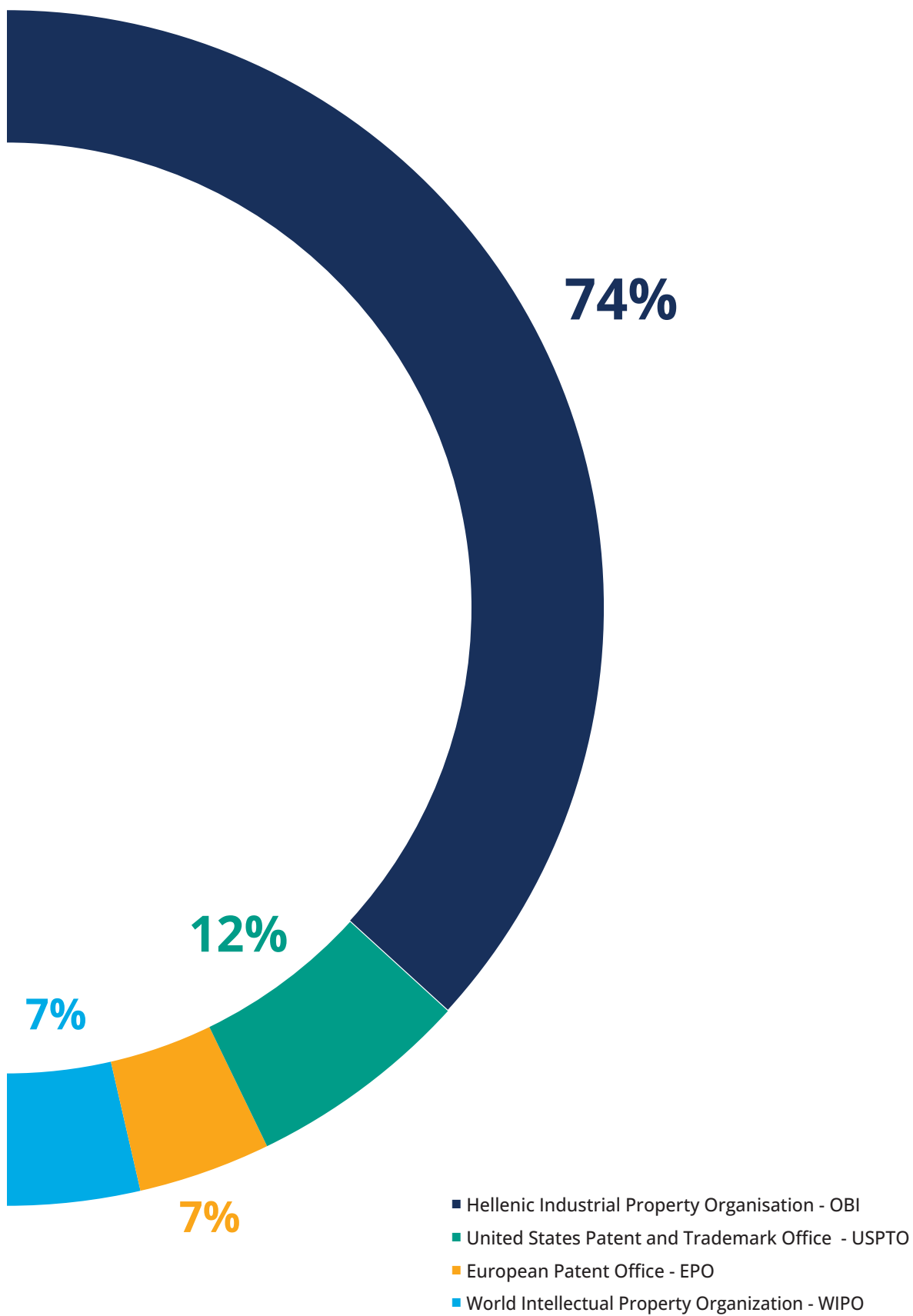
To this end, the Centre for Research and Technology Hellas actively supports the protection of its Industrial Property for the benefit of the national economy. Today, CERTH holds 42 active patents, an increase of three new patents compared with 2024. The majority of these (around 74%) have been filed through the Hellenic Industrial Property Organisation (OBI), while the remainder are covered by the USPTO, EPO and WIPO.

At the same time, in several cases licensing agreements have been concluded with bodies at both national and international level - from water and energy management to the development of therapies for humans and for industry - strengthening the connection between research and society.

The diagrams that follow depict the cumulative evolution of CERTH's active patents per year, as well as their distribution by jurisdiction of validity.



Cumulative active patents.



Jurisdictions of validity of active patents.

2. RESEARCH EXCELLENCE

Development Initiatives

In 2025, the expansion of CERTH's infrastructure advanced rapidly under the CERTH 2.0 project, funded by the European Investment Bank and the Recovery Fund.



The AI Nucleus facility focuses on providing advanced artificial-intelligence services aimed at optimising production processes, harnessing the capabilities of the 4th Industrial Revolution.

During the year, the new AI Nucleus facility of the Information Technologies Institute was completed - ahead of the original schedule - within Technopolis: a new, strategically important centre for research and innovation in artificial intelligence in Northern Greece, filling a genuine gap in the region's ecosystem. Its location within Technopolis strengthens connections with innovative businesses and market players, creating fertile ground for collaboration and applied research.

Beyond its specialised human resources, the Centre possesses powerful computing infrastructure capable of supporting the development, training and use of large artificial-intelligence foundation models. In this way, it aspires to operate as a hub for transferring know-how and meaningfully connecting research with entrepreneurship.

The procurement of its equipment is already under way, with critical infrastructure funded by the Region, including modern laboratories and technological equipment for cybersecurity and Industry 4.0, supported by well-trained and specialised staff.



Photorealistic design of the AI Nucleus facility.



The AI Nucleus facility today.

At the same time, construction is under way of the Smart AgriFood Pilot Facility (GreenHouse) of the Institute of Applied Biosciences (INAB), as well as of the Remote Collaboration and Knowledge Sharing Facility at CERTH's main premises, which will serve as a space for showcasing and disseminating the research conducted at CERTH and its results.



Photorealistic design of the Smart AgriFood Pilot Facility (GreenHouse).



The Smart AgriFood Pilot Facility (GreenHouse) will host research infrastructure for the biological and biomedical sciences.



Photorealistic design of the Remote Collaboration and Knowledge Sharing Facility.



The Remote Collaboration and Knowledge Sharing Facility today. This building will become a point of reference for the conference needs of CARTH's Institutes, welcoming researchers and partners to a space for the exchange of knowledge and innovation.



Photorealistic design of "The Factory" facility.



"The Factory" facility in Lakkoma, Halkidiki, in 2025. The facility will operate as a hub hosting start-ups and CERTH pilot units.

Likewise nearing completion is "The Factory" facility in Lakkoma, Halkidiki, which will serve as a space hosting start-ups and other CERTH pilot units, as well as business initiatives for all the Centre's Institutes. This facility will include specialised laboratories and research offices focusing on technologies such as biofuel production, energy storage, carbon dioxide capture and shipping.

At the same time, the IBO-HiVe complex in Mezourlo, Larissa, dedicated to the bioeconomy and agri-technology and currently under construction, is a flagship milestone in establishing CERTH as a core part of the research and productive sector in Thessaly.



Photorealistic design of the IBO-HiVe facility in Mezourlo, Larissa.



The IBO-HiVe complex in Mezourlo in 2025, a facility that will strengthen CERTH's role in the bioeconomy and agri-technology in Thessaly.

Halki Interactive Park: A new model of green transition for the islands begins operation

On 21 October 2025, Halki hosted the inauguration of the Interactive Park of Green Technologies for Islands, under the flagship national “NISOS” initiative. The inauguration was performed by the Chairman of the Board of Directors of CERTH and the Mayor of Halki, marking a significant step in promoting green innovation in the island region.

The Park was developed by CERTH on 3.5 hectares granted by the Municipality of Halki and is an open, living space of knowledge and technology. It hosts innovative green-transition solutions developed by CERTH research teams in collaboration with Greek research bodies, universities and businesses, highlighting the dynamism of the Greek scientific and business community.

The visitor experience begins at the island’s port and unfolds along a thematic trail of three stations - green energy, the circular economy and sustainability - culminating at the Park site, where modern technologies and applications are presented. The Park is already in operation, with prospects for further enhancement and enrichment, as well as for developing digital tools that will allow remote tours and the dissemination of knowledge to a wider audience.



At the inauguration of the Halki Interactive Park in October.

The Park was developed by CERTH on 3.5 hectares granted by the Municipality of Halki and is an open, living space of knowledge and technology. It hosts innovative green-transition solutions developed by CERTH research teams in collaboration with Greek research bodies, universities and businesses, highlighting the dynamism of the Greek scientific and business community.

A new development prospect: CERTH's branch in Naoussa

As part of the strategic strengthening of research and innovation, the establishment of a branch of the Centre for Research and Technology Hellas (CERTH) in the town of Naoussa was set in motion, marking a significant development milestone for the area.

The plan provides for the use of the traditional Longos-Tourpalis building complex, with a total area of 2,300 m², to house the activities of the new branch, as well as the grant of a 100-hectare plot for the creation of an experimental field.

This initiative creates the conditions for the development of research and technological activities with direct impact on the local economy, the primary sector and innovation. The collaboration was formalised with the signing of a Memorandum of Understanding between CERTH and the Municipality of Naoussa in May 2025.

The new branch aspires to become a hub of research, innovation and collaboration through four main pillars:

Strengthening local research activity by harnessing the area's existing scientific talent and attracting researchers from the diaspora; connecting with local entrepreneurship



The members of CERTH's delegation and representatives of the State at the inauguration of CERTH's branch in Naoussa.

and transferring know-how through the creation of joint laboratories with local production units to co-develop innovative products and technologies, particularly in the fields of agri-food, manufacturing and winemaking; establishing a start-up incubator to serve as a support mechanism for new business initiatives; and education and training activities that will promote skills development and the integration of young scientists and professionals into the research and innovation ecosystem.

Hydrogen Innovation Hub (H2-Hub): Launch and foundation

2025 was the launch and foundation year of the Green Hydrogen Technologies Park of the Hydrogen Innovation Hub (H2-HUB), which involves the creation of a pilot, integrated green-hydrogen facility covering all the main stages of the value chain: from production and storage to the use and final supply of the fuel. The site is developing a green-hydrogen production unit combined with a combined heat and power (CHP) system, as well as a hydrogen refueling station to serve heavy and other vehicles.



The H2-HUB Green Hydrogen Technologies Park in Ptolemaida lays the foundations of the energy transition.

The project is in full swing, and the progress achieved creates the conditions for strengthening research and innovation in the operation of innovative green-hydrogen systems in our country and ensures the successful application of these technologies.



Innovative technologies for the production, storage and use of green hydrogen under real operating conditions.

The establishment and development of the Green Hydrogen Technologies Park of the Hydrogen Innovation Hub is located in the Region of Western Macedonia, on a 20-hectare plot on the site of the former AEVAL, in the area of Ptolemaida (VIO. PA.P. industrial park). It is a flagship project of the post-lignite era, with the main objective of demonstrating the technology for producing, storing and using green hydrogen from electricity generated by renewable sources. The project is part of the “Just Development Transition 2021–2027” programme, with co-financed public expenditure of €19.8 million.



Installation of a 1 MW photovoltaic system and development of green-hydrogen infrastructure at this flagship project of the post-lignite era.

During the first year of implementation, significant preparatory and construction works were carried out, laying the foundations for the development of the infrastructure. Specifically, works to grade and remediate the plot and to fence the site were completed, as was the installation of the 1 MW photovoltaic system. In parallel, work advanced on the foundations and construction of the main building infrastructure that will house the technological equipment, the offices, the meeting room and the project's Control Centre.

A central role in the project is played by the installation of a modern energy system harnessing renewable sources, with the aim of demonstrating and evaluating innovative green-hydrogen technologies under real operating conditions. In parallel, the installation of specialised metering and support equipment is planned, so that the performance and operation of the individual systems can be monitored and useful conclusions drawn for future applications.

Business Innovation

In 2025, CERTH continued to develop dynamically its role as a bridge between the research community and the market. As the lead body of three innovation clusters and one Competence Centre, it collaborated with a wide range of businesses, promoting innovation with particular emphasis on the fields of Industry 4.0, transport and smart buildings.

2025 was a particularly significant and mature phase for the Agile 4.0 Digital Innovation Hub - Cluster, with the main emphasis on its operation as a testing, demonstration and maturation facility for innovative Industry 4.0 technologies. During the year, the Agile 4.0 building was used intensively as a testbed, enabling the gap between research results and industrial application to be bridged.

CERTH's Information Technologies Institute (ITI), as the cluster's supporting body, actively supported the implementation of the "TITAN Digital Accelerator" initiative, an integrated collaboration platform for the development, testing and evaluation of digital solutions in the industrial sector. As part of this initiative, the Agile 4.0 building's facilities are used for developing and validating technologies such as artificial intelligence, robotics, digital twins and industrial data analysis, enabling the simulation and optimisation of processes before they are applied in real factories.



In 2025, Agile 4.0 - Cluster strengthened its role as an innovation hub, accelerating industrial digital transformation.

Particular emphasis was placed on testing and evaluating the solutions under development in a controlled environment, using the equipment and digital infrastructure of Agile 4.0, which makes it possible to reduce technological risk and accelerate the transfer of solutions into industrial production. At the same time, Agile 4.0 operates as a demonstration space, supporting the understanding and adoption of Industry 4.0 technologies by industry.

In addition, the Agile 4.0 facilities are also used for education and training activities, as part of CERTH's participation in the European project CIRCMAN5.0. In this context, the Agile 4.0 building serves as a training space for the industrial community, supporting skills development in fields such as the circular economy and remanufacturing, as well as the use of advanced Industry 4.0/5.0 digital technologies.

Overall, in 2025 the Agile 4.0 – Cluster strengthened its role as an integrated innovation hub, supporting not only the development of technologies but also their maturation, testing, demonstration and dissemination to industry, actively contributing to the digital transformation of the productive base.



2025 was a year of steady growth and targeted presence for the I4byDesign Competence Centre, with emphasis on participation in European projects and the

strengthening of its international networking. By continuing its activities, the Centre maintained its active role in the field of industrial and digital innovation.

In the field of Research and Innovation, I4byDesign took an active part in six Horizon Europe projects, contributing to actions concerning the circular economy, digital transformation and sustainable industrial development. Through these actions, the Centre supports the dissemination and uptake of innovative solutions, strengthening the connection between research and industry.

At the same time, I4byDesign strengthened its outward orientation through its participation as an exhibitor at the international ETSI UCAAT conference (User Conference on Advanced Automated Testing), one of the most important events in the field of automated testing. This presence provided an opportunity for exchanging know-how and networking with leading players in the field, highlighting the Centre's role in testing, standardisation and industrial applications.

Consistent with its vision, I4byDesign continues to invest in innovation and international collaboration, actively contributing to the transition towards a more digital and sustainable industry.

Innovation with Real Impact: A Milestone Year for the IsZEB Cluster



In 2025, the IsZEB Cluster marked a pivotal year, celebrating five years of dynamic development and achieving a significant market breakthrough. For the first time, the team successfully secured private-sector contracts, collaborating with well-

established companies to provide specialized consulting services on smart building systems and assessments based on the IsZEB Standard.

Building upon the foundations established in previous years, 2025 became the year in which innovation was fully realized in practice. From office buildings and residential blocks to sports facilities, the value of the Smart Readiness Indicator (SRI) - an emerging methodology gradually gaining ground in Greece - was clearly demonstrated in real-world applications.

At the same time, IsZEB continued to strengthen its research and development activity, securing regional funding for its investment plan and actively participating in SYNERGINN EDIH. As part of its educational initiatives, the Cluster is preparing an asynchronous, remote training programme for engineers focused on the SRI, while its involvement in the Built4People Initiative further reinforces its role within the European innovation ecosystem.



The IsZEB Cluster container, where research on smart buildings and the Smart Readiness Indicator (SRI) moves into practice and to market.



Two years after the end of the Mobilog project, the supporting body — CERTH's Hellenic Institute of Transport (HIT) — continued in 2025 to support the activities of the Smart Mobility & Logistic Solutions Cluster innovation cluster, as well as its member companies and prospective new members.

The main activities carried out in 2025 concerned:

- Supporting members through their involvement in the ecosystem of the Smart Mobility Living Lab.
- Meetings among members.
- Informing members about opportunities for capacity building, funding and collaboration.
- Presence at B2B matching events and related workshops

The Smart Mobility & Logistic Solutions Cluster - Mobilog innovation cluster was represented by HIT at a B2B matching event, and with a presentation, at the corresponding "Mobility Solutions Made in Germany" innovation workshop on Tuesday, 25 February 2025, organised by the Greek-German Chamber of Commerce and Industry on behalf of the Federal Ministry for Economic Affairs and Climate Action (BMWK), as part of a business mission to Greece and Cyprus on the theme of e-mobility and the Smart City.



The Smart Mobility & Logistic Solutions Cluster – Mobilog innovation cluster also took part in a Clusters Day held on 15 October 2025 at NOESIS, Thessaloniki.

At the workshop, HIT scientific associate V. Mizaras presented the innovation cluster, and Mr G. Voulgaroudis, CEO of Brainbox, represented the cluster at the round table.

HIT scientific associate V. Mizaras.

Research Projects and Results

CERTH's broad participation in national and European funding projects continues to serve as a clear indicator of its research excellence across a wide spectrum of scientific fields, as well as of its commitment to creating sustainable value for society and the economy through the results it generates.

During 2025, the Centre completed 110 competitive European projects, which gave rise to a wealth of innovative technologies, strengthening its international presence and contributing to the development of sustainable solutions for critical sectors such as energy, health, smart cities and sustainable nutrition.

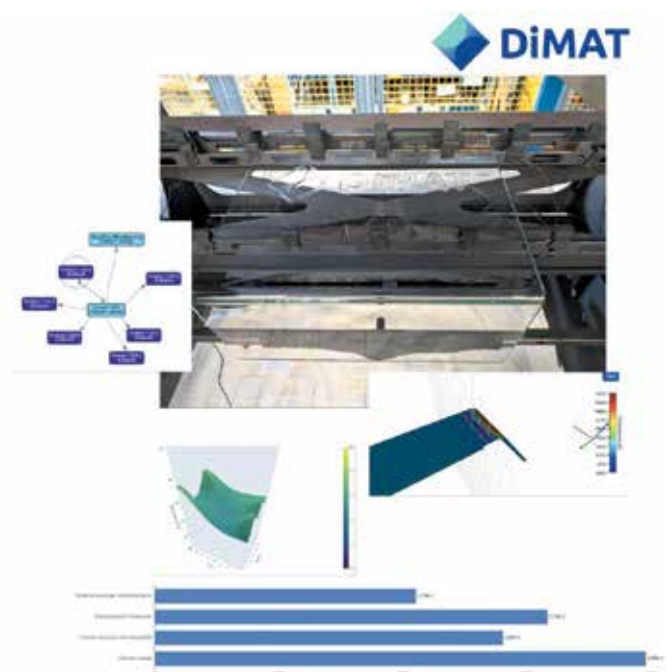
Presented below are indicative examples of research results in the Centre's main areas of activity, highlighting the excellence, innovation and social impact of its research.

Industry 4.0

Digital Tools for Advanced Materials

The DiMAT (Digital Modelling and Simulation for Design, Processing and Manufacturing of Advanced Materials) project developed open digital tools that support modelling, simulation, and optimisation across the entire materials value chain - from material design to processing and manufacturing. By integrating advanced data analysis, modelling, and simulation technologies, the project aimed to make these capabilities accessible to SMEs and mid-caps, enabling them to improve the quality, sustainability, and efficiency of materials and manufacturing processes. The project delivered three integrated digital suites and validated them through industrial pilots in sectors such as textiles, composites, glass, and graphite.

Within the project, CERTH acted as the project coordinator and led the overall implementation of the project's technical and administrative activities. CERTH contributed its expertise in artificial intelligence, multimodal data analysis, and digital manufacturing technologies to support the development and integration of the DiMAT digital tool suites, facilitating data-driven decision-making and the adoption of advanced digital solutions across the European



Application of the DiMAT toolkits in real production conditions in Hegla Hanic/Fraunhofer plant (Pilot 3), for assisting real time monitoring of the temperature and the quality of the final product.

materials manufacturing ecosystem. CERTH also developed the Materials Modeler (MM), an AI-powered toolkit to predict material performance, identify key material and process parameters affecting product quality, and enable data-driven decision-making while reducing costly experimental iterations.

Artificial Intelligence for resilient and circular industrial production

The AIDEAS (AI-Driven industrial Equipment product life cycle boosting Agility, Sustainability and resilience) project developed advanced artificial intelligence solutions to support the full lifecycle of industrial equipment—from design and manufacturing to use, repair, reuse, and recycling. By integrating AI with engineering and manufacturing systems, the project contributed to the optimisation of the production processes, it enabled predictive maintenance, and promoted circular economy practices. Through these innovations, AIDEAS enhanced the sustainability, resilience, and competitiveness of European manufacturing industries.

Within the project, Centre for Research and Technology Hellas (CERTH) acted as the project coordinator and contributed to the development of key AI technologies and data-driven solutions. In particular, CERTH led the development of the AIDEAS Machine Passport and supported knowledge management and explainable AI capabilities, facilitating trusted data sharing and intelligent decision-making across the machinery lifecycle.



Deployment of the AIDEAS solutions at the MULTISCAN Technologies factory, facilitating the operation of inspection machines during fruit processing.

Autonomous Collaborative Robotic System for Precision Viticulture Using Aerial and Ground Vehicles



The project team during laboratory testing.

Modern agriculture faces significant challenges, including climate change, rising production costs, and labour shortages. Within the framework of the AGROSYS project, an integrated precision viticulture system was developed that utilizes collaborative electric unmanned aerial vehicles (UAVs) and unmanned ground vehicles (UGVs) for the monitoring and management of vineyards.

The robotic platforms incorporated multispectral, hyperspectral, and thermal sensors, as well as mapping and data analysis systems, enabling the assessment of crop conditions and plant water stress, while supporting cultivation practices such as variable-rate irrigation, fertilization, and selective harvesting. The collected data were gathered and processed through a Farm Management Information System (FMIS), which supported decision-making and the optimal planning of agricultural operations. The project also included the development of autonomous solar charging stations for the electric robotic vehicles, enabling energy autonomy and the continuous operation of the collaborative fleet within the vineyard.

The Institute for Bio-Economy and Agri-Technology of the Centre for Research and Technology Hellas (CERTH|iBO) made a significant contribution to the development of the robotic platforms and the algorithms for autonomous navigation and fleet management of UAVs and UGVs. It also participated in the implementation of the data processing platform and in the testing of the integrated system under real vineyard conditions. In parallel, the institute was responsible for conducting the Life Cycle Analysis (LCA) and the Techno-Economic Analysis, aiming to evaluate the environmental impacts, energy performance, and economic viability of the system.

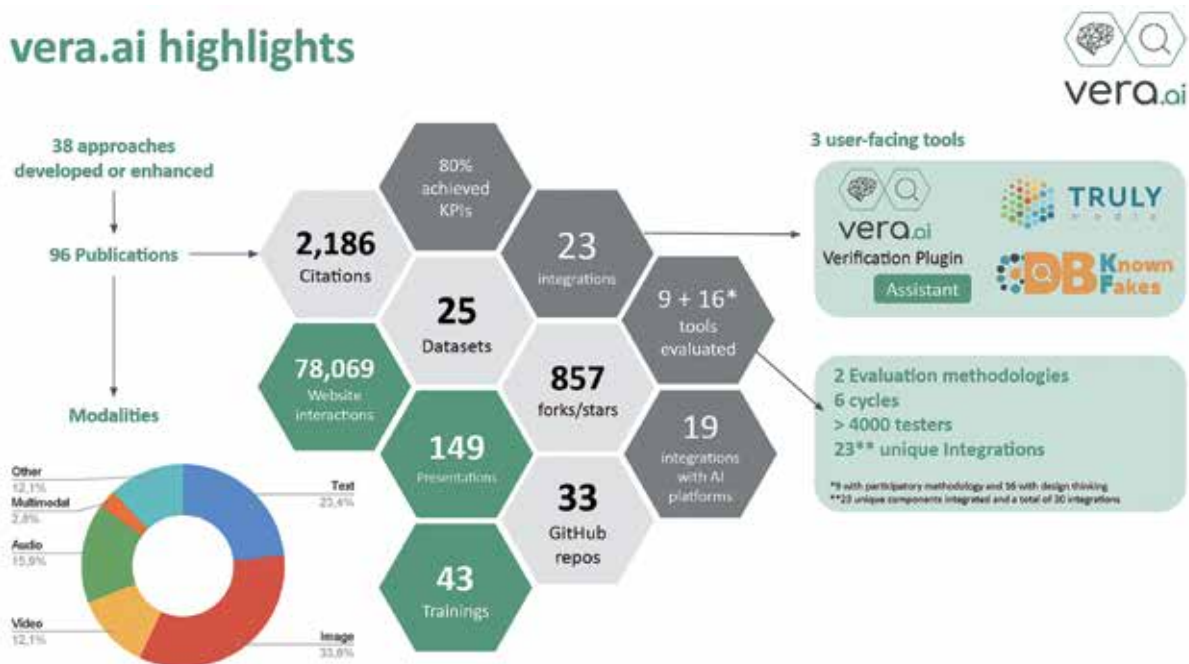
The AGROSYS research project was funded under the National Recovery and Resilience Plan "Greece 2.0," financed by the European Union – NextGenerationEU, and had a duration of 38 months.

Safety and Protection of the State and its Citizens

Τεχνολογίες καταπολέμησης της Παραπληροφόρησης

Protecting against systematic disinformation campaigns—continuously amplified through the use of Artificial Intelligence (AI) and social media and communication platforms—is essential for safeguarding healthy democratic dialogue and social cohesion in modern society. CERTH-ITI is the coordinator of two major related research projects.

vera.ai (VERification Assisted by Artificial Intelligence) is one of four European Commission research and innovation projects aimed at tackling online disinformation through the development of AI-based verification tools and services capable of analyzing multi-modal content (text, images, video, audio) across multiple languages.



Summary of the achievements of the vera.ai research project in terms of results, success indicators, and impact.

The project's outcomes include numerous methods and tools that enhance the detection and analysis of manipulated or misleading content, broader integration into open verification environments (with more than 170,000 users worldwide), as well as contributions to research and standards for AI transparency and disinformation—strengthening the digital information ecosystem and supporting trustworthy media verification practices at scale.

In addition, the MedDMO 2.0 project (Mediterranean Digital Media Observatory 2.0) is one of 15 Digital Media Observatories in Europe, covering Greece, Cyprus, and Malta, and bringing together research, fact-checking, media, and educational communities. The project has established a regional knowledge and operational platform for monitoring disinformation, contributed to strengthening the capabilities of journalists and fact-checkers through tools, training, and shared resources, increased public awareness through media literacy campaigns, and enhanced cross-border collaboration—ultimately improving the detection, analysis, and societal resilience to disinformation within the Mediterranean information ecosystem.



MedDMO regularly publishes investigations into disinformation campaigns.

The vera.ai research project was funded by the European Commission under the Horizon 2020 programme and had a duration of 36 months, while the MedDMO 2.0 project is funded under the Digital Europe Programme and will run for 36 months (until August 2028).

Sustainable Resource Management and Securing the Energy Future

A new generation of certificates for the assessment of smart and sustainable building units and building complexes.

The transition to a sustainable and climate-neutral built environment requires advanced methods for assessing energy efficiency. The SmartLivingEPC project contributed in this direction by introducing a new generation of “smart” Energy Performance Certificates (EPCs) for buildings and neighbourhoods.

SmartLivingEPC, funded by the European Commission under the Horizon Europe, developed a reliable and scalable methodology for calculating energy performance, leveraging life-cycle data and integrating automation, artificial intelligence, and digitalisation technologies.

Within the framework of the project, an integrated multi-parameter assessment system was implemented, combining energy and non-energy indicators and extending the analysis from the building level to the neighbourhood level. At the same time, innovative solutions were developed such as the SmartLivingEPC platform, the SmartLivingEPC Digital Twin, and AI tools for monitoring, analysis, and performance optimisation.

The effectiveness of the solutions was validated through pilot implementation in nine pilot sites in Greece, Spain, Cyprus, and Estonia, covering different building types as well as a building complex. In total, 11 key performance indicators (KPIs) were assessed, covering technical, economic, environmental, and social parameters, while a combination of quantitative and qualitative analysis methods was applied, including surveys across multiple stakeholder groups and cost-benefit analyses.

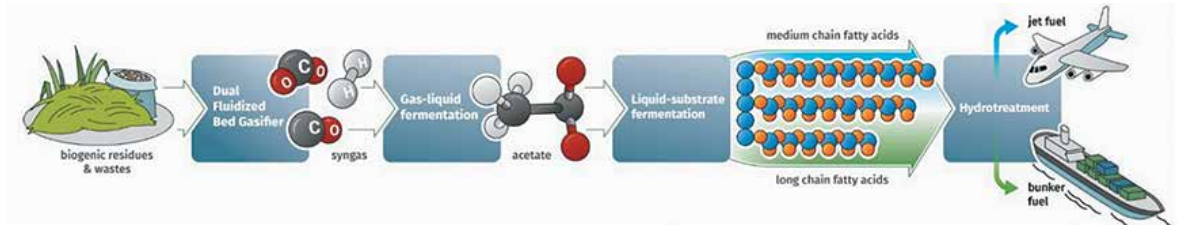
At the same time, 10 key exploitable results (KERs) were identified, business models were developed, and value networks among stakeholders were analysed, strengthening the prospects for exploitation of the project outcomes.

The project was completed in 36 months, with the participation of 16 partners from 12 countries, making a substantial contribution to the development of next-generation EPCs and to improving energy efficiency and quality of life in the built environment.



At the final SmartLivingEPC project meeting in Brussels in May 2025.

Development of new technologies for the production of advanced aviation and maritime biofuels (CPERI)



The BioSFerA technological scheme.

Biofuels are an important solution for reducing transport emissions, particularly in shipping and aviation, where alternative options are technically limited. Today, the most mature technology for producing such fuels is HEFA-type fuel, derived from the processing of vegetable oils, used oils and fats, which is expected to remain a key option at least until 2030.

However, the limited availability of suitable feedstocks means that these fuels cannot meet future demand on their own - demand that is expected to rise significantly by 2050. For this reason, the development of advanced biofuels from biomass residues and waste is being promoted.

Within this context, the BioSFerA research project developed, at pilot scale, a new method for producing such fuels, harnessing biogenic waste and combining thermo-catalytic and biological processes. The process involves converting gas produced from biomass into acetic acid by bacteria and then converting it into microbial oil by yeasts, which can be hydrogenated to produce fuels suitable for ships and aircraft.

Pilot tests showed that the microorganisms operate effectively and are resistant to the pollutants in the gas, reducing the need for complex purification. The project also introduces microbial oil as a new feedstock

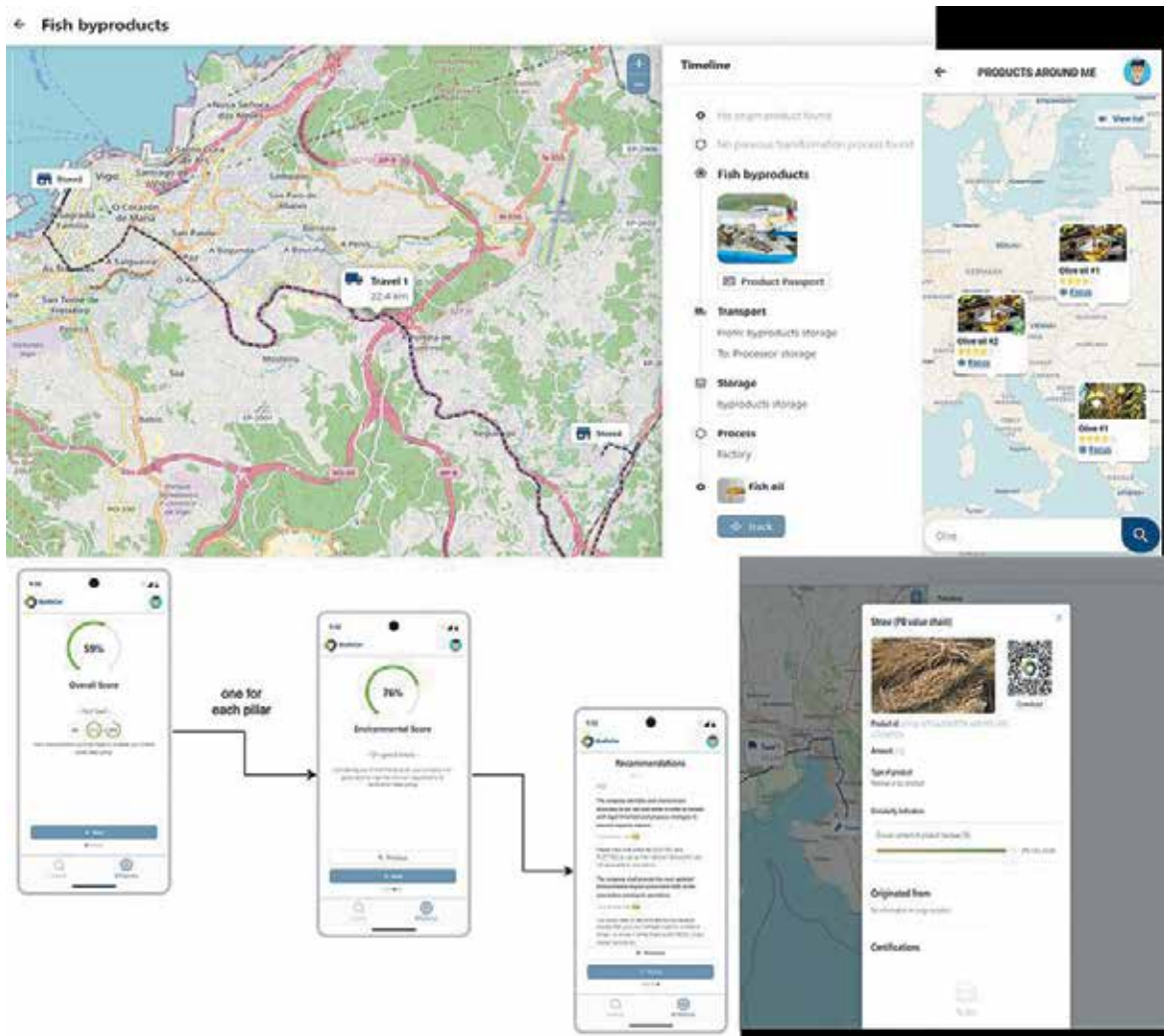


Samples from the biofuel fractions produced.

for producing green fuels in existing HEFA units, broadening the available options in line with the European RED III directive. CERTH's Chemical Process and Energy Resources Institute made a decisive contribution to developing and testing the technology, producing 300 litres of fuel at pilot scale and carrying out analyses showing that the new method can reduce greenhouse-gas emissions by up to 86% compared with conventional fuels, while the estimated production cost remains competitive with other advanced-biofuel technologies.

The BioSFerA research project was funded by the European Commission through the Horizon 2020 programme and ran for 48 months.

Digital Tools to Enhance the Circular Utilization of Biomass and the Green Transition



Traceability platform for biological feedstocks developed within the BioReCer project.

Current challenges associated with the green transition and the circular economy highlight the need for reliable monitoring, traceability, and optimal valorisation of biological flows and secondary feedstocks. In a context where European legislation, such as the Ecodesign for Sustainable Products Regulation (ESPR) and the Corporate Sustainability Reporting Directive (CSRD), impose stricter transparency and accountability requirements, the development of innovative tools and infrastructures for recording and tracing biological feedstocks constitutes a fundamental prerequisite for the transition towards more sustainable production and consumption patterns.

The platform developed within the BioReCer project supports traceability and the provision of reliable sustainability information for bio-based products, leveraging tools such as Material Flow Analysis (MFA) and the Digital Product Passport (DPP). Through the quantification of material flows and the transparent documentation of origin, production processes, environmental performance and product life cycle, the valorisa-

tion of residual biomass and secondary bio-based resources is facilitated, while evidence-based decision-making by businesses and consumers is strengthened.

A particularly significant role was undertaken by the Centre for Research and Technology Hellas (CERTH), through the laboratories of “Environmental Engineering and Sustainability” of the Institute for Bio-Economy and Agri-Technology (iBO) and “Natural Resources and Alternative Forms of Energy” of the Institute of Chemical Processes and Energy Resources (CPERI). CERTH conducted the Material Flow Analysis for the products studied within the project, systematically quantifying inputs and outputs of biological resources across all stages of the value chain. In parallel, it contributed to the development of holistic assessment frameworks and robust sustainability indicators by integrating environmental, social, and economic criteria, as well as circularity parameters.

The BioReCer research project was funded by the European Commission under the Horizon Europe Programme (GA: 101060684) and had a duration of 39 months.

Novel CO₂-based electrothermal energy and geological storage system

The increasing use of renewable energy sources with the aim of reducing the use of fossil fuels requires the implementation of energy storage methods to address issues that characterize them, like the intermittency of the energy supply. CEEGS is a technology that combines an above-ground renewable energy storage system, based on transcritical CO₂ cycles, the storage of CO₂ in geological formations and the utilization of geothermal energy by converting it into electricity. It is a highly efficient concept that can be integrated into the grid, used for heating and cooling applications, as well as, in industry. It also has the potential for partial CO₂ sequestration. The main objective of the project is to provide scientific proof of the techno-economic

feasibility of the technology, increasing the current low Technology Readiness Level (TRL) from 2 to 4 by addressing the gaps in the interface between the above-ground energy storage system and the underground CO₂ storage.

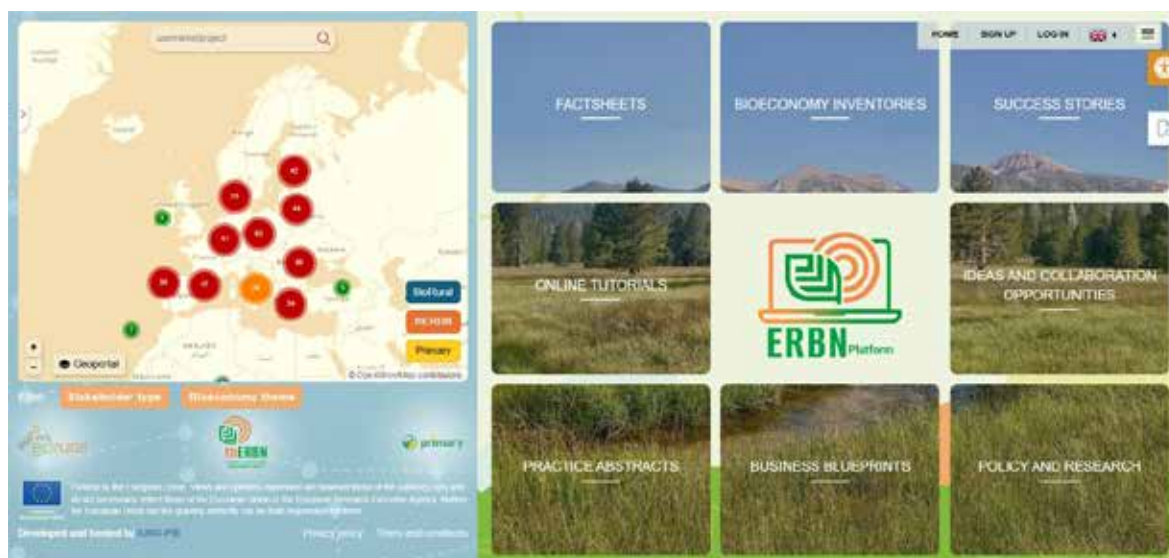


The CEEGS system

Particularly important was the contribution of CERTH to the project, through the investigation of the geological and technical parameters and consequently in the development of the mathematical and geochemical simulation models of the system and the evaluation of its overall performance, as well as, in the development of the

digital twin. Machine learning models were also developed for the estimation of thermophysical properties while business plans for the commercial exploitation of the project were explored. The CEEGS research project was funded by the European Union Horizon Europe (Horizon - RIA) and had a duration of 36 months.

Accelerating the Integration of Circular Bio-Based Solutions in European Rural Areas



The BioRural Toolkit.

Europe's rural areas play a key role in the EU's sustainability transition but face significant structural challenges. BioRural, a three-year project, focused on mainstreaming circular bio-based solutions across rural Europe. The project worked across three main areas: sharing practical knowledge, building strong networks, and identifying and supporting circular initiatives, while also developing business models and policy recommendations to support the transition.

Key results include the BioRural Toolkit, an online platform hosting practical resources for stakeholders, and the European Rural Bioeconomy Network (ERBN), created to sustain collaboration and knowledge exchange. Through national and regional workshops, the EU Bioeconomy Challenge, and the European Rural Circular Bioeconomy Conference, the project provided a platform for innovators and rural stakeholders. With 40 success stories from 12 countries, BioRural demonstrated that the bioeconomy is already being implemented through many small-scale initiatives.

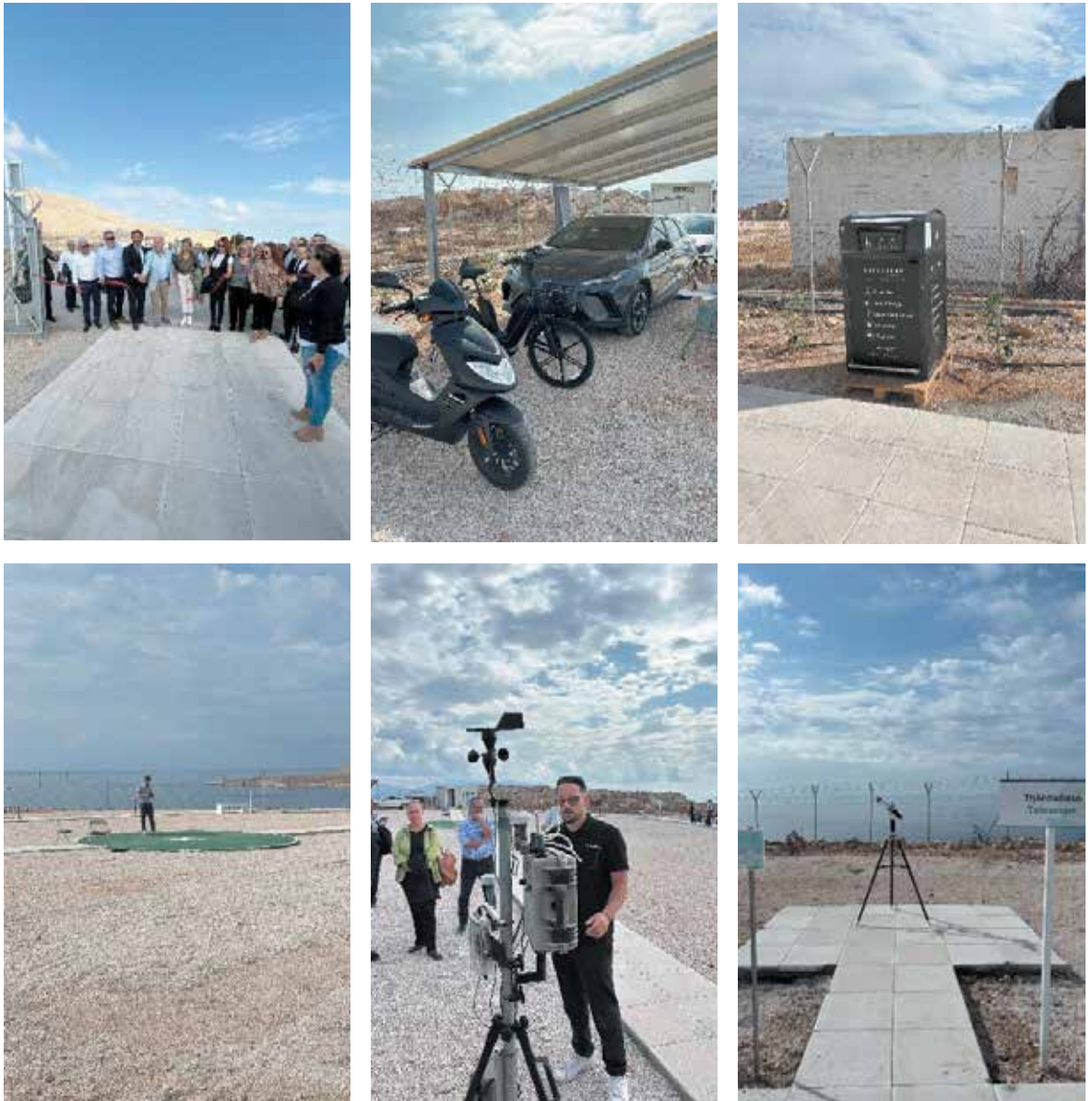


Meeting of the BioRural consortium.


CERTH was the overall project coordinator, leading a consortium of 19 partners. It also led several key activities, including reviewing the status of the EU bioeconomy, capturing innovation insights from stakeholders through 42 national workshops, and leading the development of policy recommendations to accelerate the circular transition.

BioRural was funded by the EU's Horizon Europe Programme under Grant Agreement No. 101060166 and ran for 36 months.

NISOS: developing and implementing innovative solutions for the sustainable development of the Greek islands



The park operated as a "living laboratory", showcasing solutions for clean energy, green mobility and the circular economy, and boosting awareness and engagement among citizens and visitors.



Through the combined use of expertise, infrastructure and policies, the NISOS project promoted energy autonomy, the reduction of the carbon footprint and the optimisation of natural-resource management, taking into account the particular social and environmental conditions of island areas. The project's pilot activities were implemented mainly on the islands of Halki, Kastellorizo and Antikythera, which served as model examples of applying green technologies and sustainable practices.

Within the project, pilot applications were developed and implemented, such as water-resource management, environmental-parameter monitoring, the promotion of electromobility, the use of renewable energy sources and the sustainable management of marine and coastal resources. In parallel, innovative tools and services for sustainable mobility and tourism were designed, such as the Green Smart Tourist Card, which aimed to encourage sustainable travel and provide smart services to island residents and visitors.

In addition, the project developed innovative digital and educational activities, such as a platform for aggregating and managing data on the islands and awareness-raising activities for the green transition. As part of this, the Halki Interactive Green Park was also created - a space for demonstrating green technologies and sustainable-development applications. The park operated as a "living laboratory", showcasing solutions for clean energy, green mobility and the circular economy, and boosting awareness and engagement among citizens and visitors.

The NISOS project ran for 31 months and was completed in December 2025. It was funded by the European Union's Recovery and Resilience Facility – NextGenerationEU, with co-financing from national Greek resources.

Smart Cities

Minimal Size Thermal and Electrical Energy Storage System for Residential Applications

The building sector is responsible for almost 40% of the total energy demand in the European Union. To reduce emissions and energy costs, an increasing number of homes are turning towards Renewable Energy Sources and especially to solar energy.

As part of the MiniStor project, a prototype compact energy storage system based on thermochemical storage was designed, manufactured and installed to enable the sustainable coverage of the heating, cooling and electricity needs of new and existing buildings. The system combines hybrid solar panels that simultaneously produce electricity and heat. It also includes a heat pump, thermal storage tanks and a battery for electricity storage. A smart digital platform monitors the operation of the system in real time. Users can monitor the production, storage and consumption of energy through an easy-to-use dashboard. The system can even feed excess electricity back to the grid. MiniStor was initially tested in the CERTH Smart Home and the first results show that it can cover up to 69% of the annual energy needs of a building.



The building sector is responsible for almost 40% of total energy demand in the European Union. To reduce emissions and energy costs, more and more homes are turning to renewable energy sources, and especially solar energy.

CERTH's contribution to the project was particularly important, as it undertook the design and initial dimensioning of the system as well as the creation of the smart platform for monitoring the system's operation.

The MiniStor research project was funded by the European Commission through the Horizon 2020 programme and had a duration of 64 months.

Promoting the energy upgrade of Europe's building stock (CPERI)

Europe's building stock is responsible for almost half of the EU's primary energy consumption and for more than one third of CO₂ emissions. The EU-funded RINNO project aims to facilitate the deep energy renovation of buildings by addressing significant technical and socio-economic barriers, offering a set of innovative technologies, improved processes supported by an online platform and software tools, and new business models.

Within the framework of the project, the Hellenic Passive House Institute implemented the deep renovation of the Greek pilot building, a social housing apartment block

located in Tavros, Athens. During the renovation, a range of innovative technologies and processes were applied and tested in real conditions. The project demonstrated that existing apartment buildings can be transformed into high-comfort, low-energy homes through deep energy renovation, avoiding the environmental and economic costs associated with demolition and reconstruction.

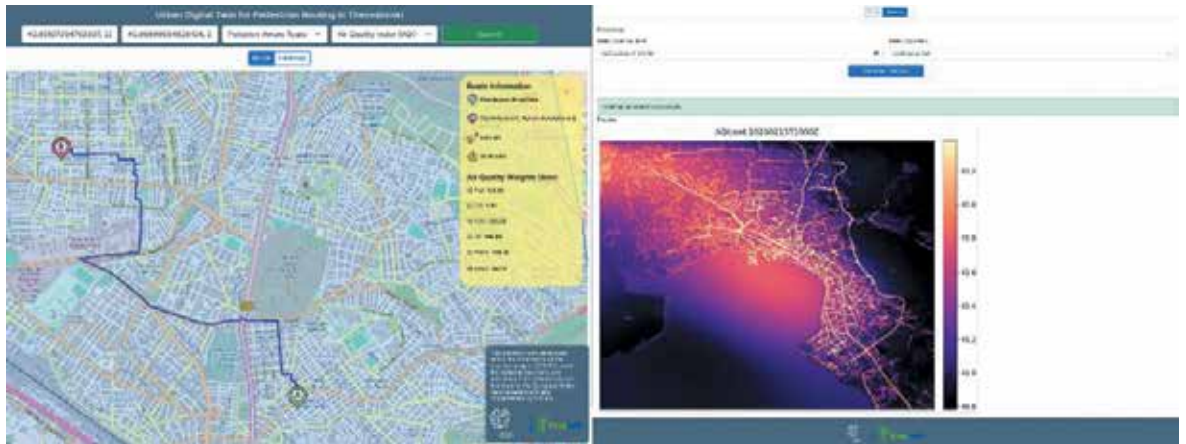
CERTH carried out three-dimensional building documentation through 3D scanning and developed the building's BIM model. In parallel, it conducted an energy analysis, as well as a life-cycle assessment (LCA) and life-cycle cost (LCC) analysis. These analyses supported the selection of the most appropriate renovation scenario during the project's design phase. Furthermore, during the building's operational phase, CERTH developed a continuous monitoring system to track indoor environmental conditions and energy consumption.

The RINNO project was funded by the European Commission under the Horizon 2020 programme and was implemented over a period of 63 months.



Energy upgrade of the Greek Pilot building by the Hellenic Passive House Institute

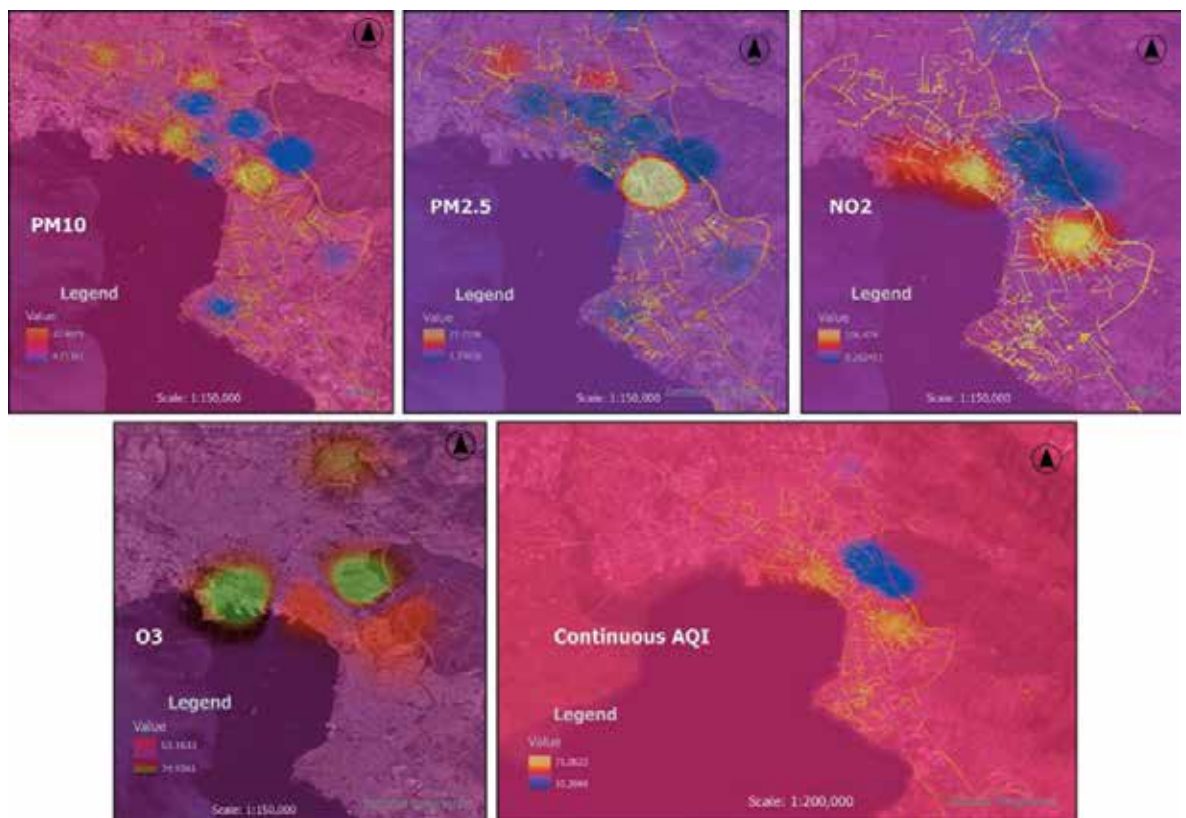
Environmental Digital Twin for Smart Cities



EnviTwin platform

Air pollution in modern cities directly affects citizens' health and quality of life, underlining the need for smart solutions that turn environmental information into practical guidance.

Within the framework of the EnviTwin project - Environmental Digital Twin for Smart Cities, an Environmental Digital Twin was developed for Thessaloniki, with the aim of comprehensively monitoring and analysing the city's environmental conditions and



Air quality rasters

linking them to smart urban-mobility applications. The project was implemented with the Aristotle University of Thessaloniki (AUTH) as coordinator and with the participation of CERTH and the Technical University of Crete, combining complementary scientific expertise.

CERTH/HIT made a particularly important contribution, developing a platform for environmentally adapted pedestrian navigation that harnesses air-quality data generated by AUTH's atmospheric-modelling and monitoring-sensor system. The platform integrates the relevant indicators into the urban pedestrian network and calculates alternative routes with reduced exposure to pollutants, balancing distance and travel time and enabling the calculation of "cleaner" routes under real urban conditions.

The project was funded by the Hellenic Foundation for Research and Innovation (HFRI), under the action "Funding of Basic Research – Sub-action II: Funding of Projects in Cutting-Edge Sectors" of the Greece 2.0 – Recovery and Resilience Facility programme.

Health Care

Towards Precision Medicine: Advanced cellular analysis in biomedical research

The "PureCell - Towards Precision Medicine: Advanced cellular analytics in biomedical research" proposal was built with the main aim to leverage the institutional capacities of the Institute of Applied Biosciences at the Centre for Research and Technology Hellas (INAB-CERTH) in biomedical research, with a particular focus on research initiatives related to precision medicine. Capitalizing on the presence of a high-skilled workforce, state-of-the-art infrastructure for omics studies (including in vitro and in silico analysis), scientific and technological excellence and extensive experience of joint initiatives in Greece and abroad, within only 4 years in existence, INAB-CERTH has accomplished landmark achievements in biomedicine, especially in cancer with a main emphasis on dissecting cancer pathophysiology towards enhancing the fundamental understanding of cancer and improving patient care.

Through this present proposal, INAB-CERTH aims to expand its current activities by incorporating new technologies and relevant instrumentation, including (i) Cell Sorter + associated Flow Cytometry; and, (ii) Metabolic Kinetics infrastructure. The expanded capacity will integrate with our existing -omics facilities and amplify its

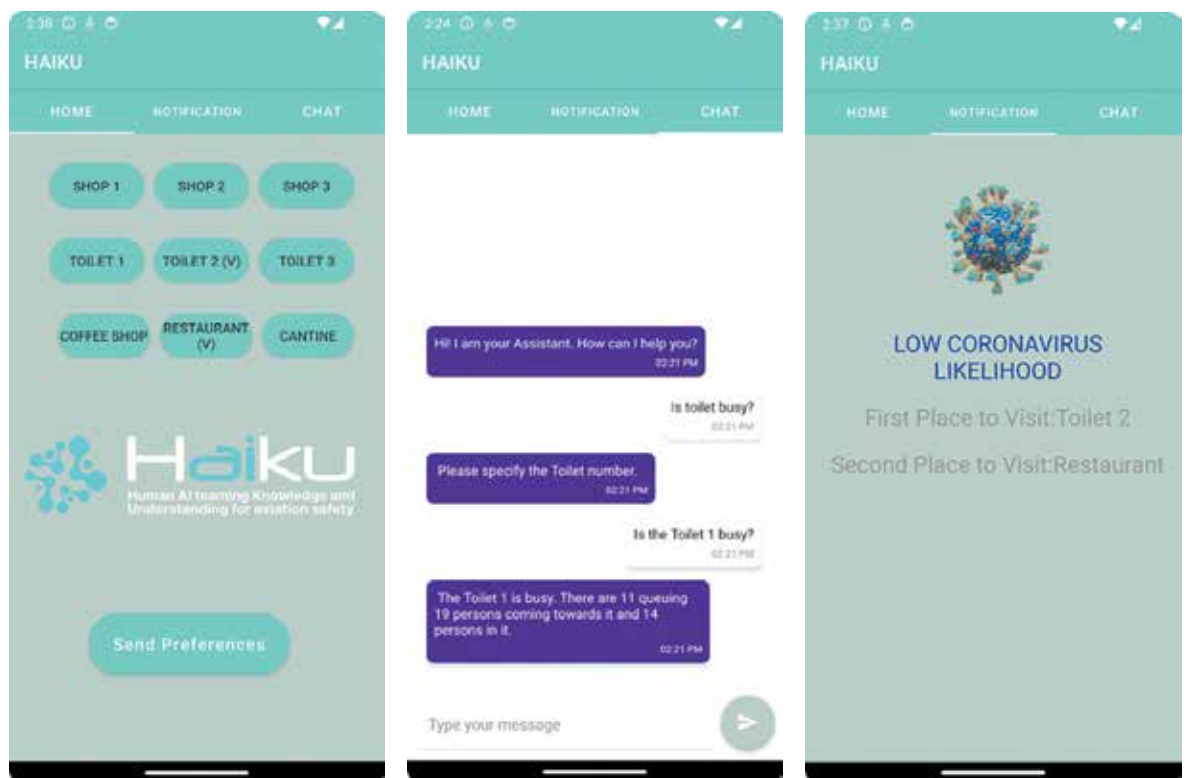


*Agilent Seahorse XFe96 Analyzer:
The Seahorse analyzer can measure the oxygen consumption rate (OCR) and the extracellular acidification rate (ECAR) of living cells in a multi-well plate.*

impact in Precision Medicine. We aim towards the establishment of a National Open Infrastructure for Advanced Cellular Analytics in biomedical research that will be relevant to not only INAB-CERTH scientists and collaborators but the academic sector at large that will have increased opportunities for cutting-edge research.

The project was funded by ELIDEK within the framework of the 1st ELIDEK Research Projects Announcement for the Support of Faculty Members and Researchers and the Procurement of High-Value Research Equipment and had a duration of 48 months.

Intelligent Assistant for the Prevention of Airborne Diseases using AI-



Screenshots of the COVAID intelligent assistant mobile application.

Passenger Clustering.

Overcrowding in indoor spaces can increase the likelihood of transmission of airborne diseases such as COVID-19. This is particularly important in airports where high passenger traffic is observed; therefore, properly routing passengers according to their intentions is essential.

Within the framework of the HAIKU project, IMET/CERTH implemented a pilot that addresses the proper routing of passengers using sensors deployed at the airport, such as cameras, and artificial intelligence (AI) to create an intelligent assistant that helps avoid crowding without significantly altering passengers' intentions regarding the airport locations they wish to visit. The intelligent assistant receives near real-time data

from the sensors and presents it to passengers in the form of visit recommendations. The routing process is performed using an intelligent weighted-coefficient algorithm that takes as inputs camera data (visitor density, queues) and the number of passengers heading to each shared space in the airport. An Android application was also developed for this purpose.

In summary, IMET implemented a complete solution that includes the development of hardware using off-the-shelf components, networking software, machine learning, artificial intelligence with natural language processing, and a mobile application. The pilot was carried out at Amygdaleon Airport in Kavala.

The HAIKU project is part of a broader framework of six pilot applications in the aviation sector, in which artificial intelligence plays a supporting role for the user, enhancing decision-making and improving the travel experience.

This research was carried out within the HAIKU project, which is funded by the European Union's Horizon Europe research and innovation programme, under call HORIZON-CL5-2021-D6-01-13 (Grant Agreement No 101075332).



A scientific symposium co-organised by the Psychology Laboratory of CERTH|INAB and the Municipality of Thessaloniki, within the IC-GROWTH research project.

Manual-based intervention in the post-traumatic growth of people with cancer in Greece

Cancer can be a deeply traumatic experience for those who go through it. The majority of the literature focuses on this fact rather than on the post-traumatic growth (PTG) that sometimes follows. PTG enables individuals not only to cope with the traumatic event (e.g. the impact of cancer) and return to their original level of functioning (e.g. health, well-being, work), but also to move to a state better than their original one (e.g. increased mental resilience).

IC-Growth has two interconnected themes, one of which is research-oriented and the other concerned with health policies and recommendations for good practice. The first comprises a systematic review in close collaboration with experts, a cross-sectional study of the relationships between variables, and a randomised clinical trial of the intervention's effectiveness. The second developed health policies and recommendations for good practice on supporting people with cancer in Greece.

The project was implemented within the framework Greece 2.0, the National Recovery and Resilience Plan, with funding from the European Union - NextGenerationEU (Implementing Body: HFRI), and ran for 38 months.

Genomics platform for cancer and public health in the EU

Genomic modifications are a significant driver for cancer, and wide-profiling of these modifications has become a major asset for early diagnosis, prognosis and treatment. The CAN.HEAL consortium recognises the need for an integrated approach to prevention, diagnosis and treatment for optimal outcomes. The project aimed to formulate recommendations for EU health systems that improve access to cancer prevention, diagnosis and treatment through personalised medicine for individuals and patients.

The clinical work of the research project focused on applying next-generation sequencing technology and identifying implementation pathways for expanding the use of genetic profiling of patients and cancer cells. In addition, CAN.HEAL created a framework for integrating and aligning the Genome of Europe biobanking initiative with public-health genomics for cancer. The CAN.HEAL consortium addressed two of the initiatives under Europe's Beating Cancer Plan: "Cancer Diagnosis and Treatment for All" and "Genomics for Public Health".

The project was funded by the European Union within the framework of the EU-4HEALTH PROGRAMME (EU4H) and had a duration of 30 months.



The final CAN.HEAL event.

Safe and Sustainable Food

Development of an environmentally friendly formulation with protective properties against pathogenic populations in crops

The extensive use of chemical plant protection products poses significant challenges due to the introduction of potentially harmful and toxic residues into groundwater, ecosystems, and ultimately the food chain. The need to identify alternative solutions is therefore urgent.

The MINEFIELD project aimed to exploit and process magnesium-based mineral resources and their by-products, which are present in abundance in the Region of Central Macedonia, in order to produce fine powders that can be applied as aqueous suspensions through spraying on plants and tree crops. In certain cases, and as a direct result of their production process, the particles of these powders exhibit a characteristic porous sponge-like morphology, which endows them with properties that enhance their activity in the effective control of potentially pathogenic organisms.

The contribution of CERTH, through the close collaboration of two of its institutes—the Institute of Applied Biosciences (INAB) and the Chemical Process & Energy Resources Institute (CPERI)—was crucial, both in the production of the alternative formulations through the processing of the relevant minerals and in the investigation of their mechanisms of action and effectiveness against specific populations of pathogens of interest.

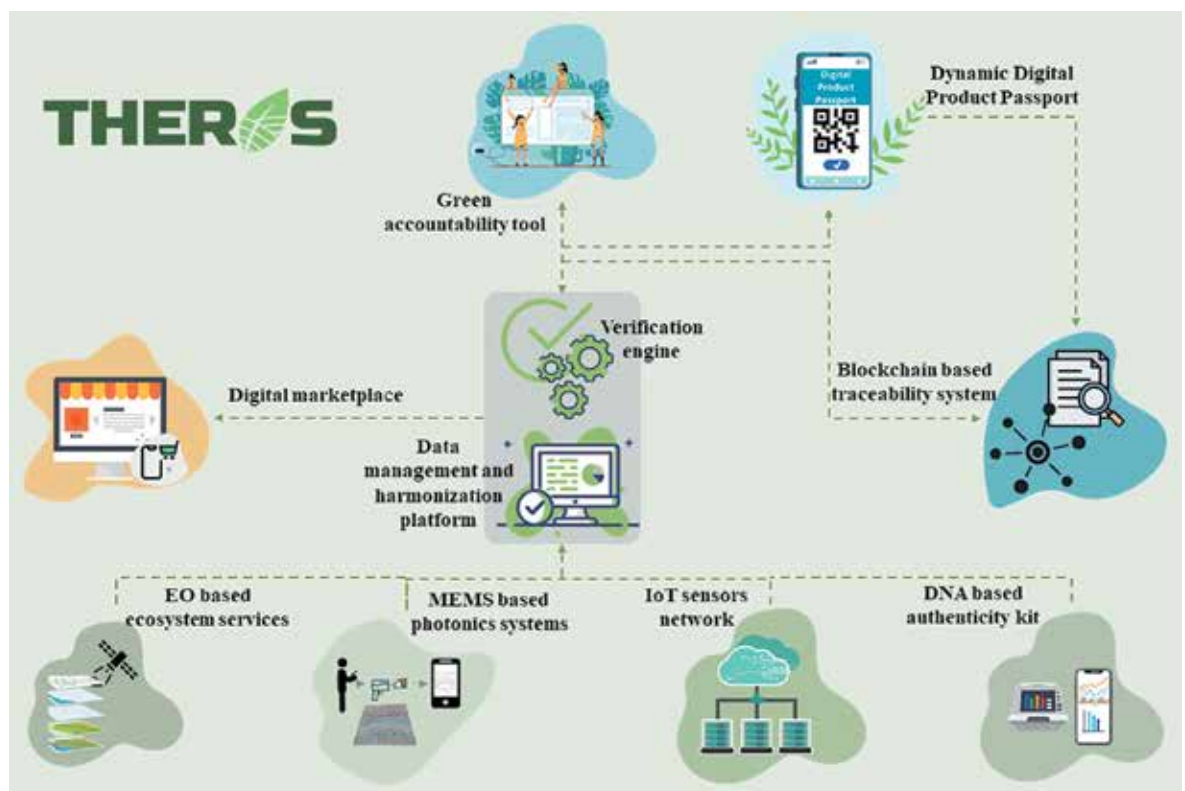


(a) Spraying campaigns with the innovative magnesium-based MINEFIELD aqueous dispersions applied on different crops and trees, and (b) olive leaves before (b1) and after the spraying campaign (b2, b3).

Through the project, the foundations were established for further research and development of such alternative formulations, with the aim of their short-to-mid-term future commercial exploitation and partial or complete substitution of conventional chemicals.

The MINEFIELD project was funded under the “Innovation Investment Plans” Action of the Region of Central Macedonia (NSRF 2021–2027). The project had a duration of 40 months, and the coordinating organisation was the K&N Efthymiadis company.

Authenticity-Verification Tools in the Food Supply Chain



A toolkit for improved verification and for preventing adulterated products and non-compliance in the supply chain for organic and geographical-indication foods.

In a constantly volatile landscape of diminishing resources and environmental change, in order to increase sustainability, safety and health within EU systems, it is essential to improve transparency across the entire food supply chain and to strengthen product verification and quality by adopting multidimensional and integrated approaches.

Within this context, the THEROS research project implemented a scalable and integrated toolkit, shaped around a multi-factor approach that addressed the various cases of fraud affecting quality-label food products (organic and Geographical Indication), while also ensuring enhanced traceability, trust and safety.

The components of the THEROS toolkit were extensively assessed in a real-world environment through four pilot applications in four different countries (Serbia, Greece, Spain

and the Czech Republic), covering a range of requirements, the participation of all relevant actors, and different organic/geographical food products and fraud/adulteration cases.

The project was funded by the European Union under HORIZON 2020 – INNOVATION ACTIONS (IA) and ran for 36 months.

Distinctions

Fifteen CERTH researchers among the top 2% of the world's most influential scientists



Fifteen researchers from the Centre for Research and Technology Hellas (CERTH) were included in the global ranking of the most influential scientists, which centres on the impact of their published work. The data was compiled by Stanford University in the United States and published by the reputable scientific publisher Elsevier on 19 September 2025.

The distinction concerns scientists ranked in the top 2% of the scientific field in which they are active; the criterion used for the final ranking was the reach of their work - that is, how their published research has accelerated progress in their respective fields and influenced the work of other researchers.

The list, which is based on data from Scopus - the largest database of abstracts and citations of peer-reviewed scientific publications - has two parts.

The first identifies scientists' overall scientific work and career, while the second counts only the citations they received during the most recent reference year, namely 2022.

Scientists are classified into 22 scientific fields and 174 sub-fields, in accordance with the standard Science-Metrix classification system, while their selection is based on the top 100,000 scientists by c-score (with and without self-citations) or a percentile ranking of 2% or higher.

This distinction for CERTH, among many others, is proof of the credible, interdisciplinary and high-level technological research carried out at the Centre. This international recognition confirms the Research Centre's standing while reinforcing its commitment to the continuous production of high-quality research and scientific excellence.

The fifteen CERTH researchers included on the list by the impact of their published work, in the first category - which concerns impact across their entire scientific career, sorted in Greek alphabetical order, are:

Panagiotis Grammelis	Energy
Angelos Lappas	Chemical Engineering
Petros Daras	Artificial Intelligence and Signal Processing
Eleni Heracleous	Physical Chemistry
Anastasios Karabelas	Chemical Engineering
Nikolaos Koukouzas	Energy
Ioannis Kompatsiaris	Artificial Intelligence and Signal Processing
Panagiotis Panagiotopoulos	Applied Mathematics
Dimitrios Rakopoulos	Energy
Michael Stoukides	Applied Mathematics
Dimitrios Tzouvaras	Artificial Intelligence and Signal Processing

In the second category, which concerns the reference year (2022) only, they are:

Petros Daras	Artificial Intelligence and Signal Processing
Angelos Lappas	Chemical Engineering
Kosmas Dimitropoulos	Artificial Intelligence and Signal Processing
Eleni Heracleous	Physical Chemistry
Anastasios Karabelas	Chemical Engineering
Ioannis Kompatsiaris	Artificial Intelligence and Signal Processing
Panagiotis Barmpoutis	Artificial Intelligence and Signal Processing
Lefteris Benos	Energy
Nikos Nikolopoulos	Energy
Dimitrios Rakopoulos	Energy
Dimitrios Tzovaras	Artificial Intelligence and Signal Processing
Paschalis Charalampous	Industrial Engineering and Automation

From Lab to Market: Successes of CERTH spin-off companies in an Innovation Competition



At the awards ceremony.

In July 2025, two CERTH spin-off companies were distinguished in the 15th NBG Business Seeds “Innovation & Technology” Competition.

First Place – Optimems

Led by Angelina Bintoudi, Optimems offers a unified Optimal Energy Management System which, thanks to its modular architecture, is able to create dynamic Virtual Power Plants. These not only maximise the returns for each investor from their direct and indirect participation in the electricity markets, but also fully support the distribution grid, thereby minimising the likelihood of black-outs. To date, Optimems' products are deployed in more than 1,200 renewable-energy parks across Greece. As a spin-off of the Information Technologies Institute (ITI), Optimems optimally combines power engineering, IoT and AI.

Honourable Mention – Agrocymo

Led by principal researcher Konstantinos Plakas, AQUARTIUM is delivering the first mobile, energy-autonomous unit for the decentralised and safe washing of empty plastic packaging of plant-protection products, under the commercial name AGROCYMO - eliminating hazardous liquid waste and promoting the circular reuse of water directly in the field. The company HYDRORAMA originates from the Natural Resources and Renewable Energies Laboratory (NRRE) of the Chemical Process and Energy Resources Institute (CPERI).

“40 Under 40” 2025 for Optimems Smart Energy Solutions

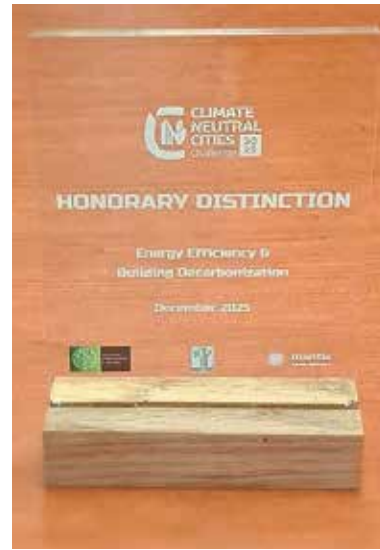


From left to right: Christos Timplalexis, Dimitris Karanassos, Angelina Bintoudi, Lampros Zygklakis.

The founding members of CERTH's spin-off company, Optimems Smart Energy Solutions, were included in the Fortune Greece “40 Under 40” 2025 list, in recognition of their work developing advanced smart energy-management solutions.



Left: At the awards ceremony.



Right: The honorary plaque.

Optimems started out in the laboratories of CERTH's Information Technologies Institute (ITI) and, in just three years, has:

- captured 25% of the Greek smart-grid market,
- been preparing to expand into six countries,
- harnessed its research expertise to create technologies with real impact.

Distinction for the D2EPC digital platform of CERTH/ITI

In December 2025, CERTH's Information Technologies Institute (ITI) and the D2EPC digital platform were distinguished at the Climate Neutral Cities Challenge 2025.

Within the Climate Neutral Cities Challenge 2025 innovation programme, the D²EPC digital platform -developed by the CERTH|ITI team during the corresponding European project - was selected from among 130 proposals and shortlisted as one of the 40 most innovative solutions capable of accelerating the transition of Greek cities to climate neutrality by 2030.

The D²EPC digital platform aspires to lay the foundations for implementing the new generation of dynamic Energy Performance Certificates for buildings, helping to decarbonise and improve building performance and to play a crucial role in the green transition.

Distinction for CERTH's spin-off: Pragma IoT is recognised at the "GREEK VALUE" awards



During the awards ceremony.

Another distinction during December of the same year went to CERTH's spin-off company Pragma IoT, for its contribution to the digital transition of industry.

For 2025, Pragma IoT was included among the businesses that stood out under the "GREEK VALUE" institution, organised by the Federation of Industries of Greece (SBE), confirming its significant contribution to the digital transition of Greek industry.

The award concerns the substantial use of innovative Industrial IoT technologies and data-driven solutions that enhance the efficiency, transparency and sustainability of production activity. Through projects in industrial facilities and critical infrastructure, Pragma IoT contributes in practical terms to the digital transformation of businesses that are key pillars of the Greek economy.

It is particularly significant that Pragma IoT, as a spin-off company, is being recognised under an institution dedicated to excellence in manufacturing, highlighting the role of technological innovation as a catalyst for growth and outward orientation.

For the tenth year running, the "GREEK VALUE" awards honour businesses that make a real impact on the Greek economy, strengthening industrial competitiveness and the future of production in the country.

Second prize went to the team from the IPSDL and NRRE laboratories of CPERI|CERTH and the Machine Dynamics Laboratory of the Department of Mechanical Engineering at AUTH, at the international SUSTENS conference on Sustainable Process Systems in



The team from the Integrated Process Systems Development Laboratory (IPSDL) and the Natural Resources and Renewable Energies Laboratory (NRRE) of CPERI | CERTH and the Machine Dynamics Laboratory of the Department of Mechanical Engineering at AUTH, which won second prize, from left to right: Athanasios Papadopoulos, Alexia Voutetaki, Konstantinos Plakas and Panagiotis Seferlis, in front of the electro dialysis unit to which the awarded work relates.

Chemical Engineering. The team used artificial-intelligence tools to develop an innovative algorithm for the integrated design and dynamic optimisation of an electro dialysis system that uses renewable energy generation and storage.

The electro dialysis process is used to purify water by removing metal ions, oxides and other pollutants. This process has been applied at pilot scale by the team above to purify water by removing (a) nitrate ions present in aquifers, producing drinking water, and (b) lead ions and sulphur oxide present in the waste of battery-production processes, where their recovery and reuse becomes possible.

The algorithm developed enables the design and operational optimisation of the electro dialysis process by adapting the unit's operating characteristics to the time-varying requirements of renewable-energy availability and clean-water demand.

The work was funded by the State Scholarships Foundation (IKY) in collaboration with EYDAP (project 53021), as part of a scholarship awarded to Ms. Alexia Voutetaki.

The research team of Dr. Stella Bezergianni, of the Chemical Process and Energy Resources Institute (CPERI), was awarded the 2nd Best Poster Prize at the 12th International Conference on Sustainable Solid Waste Management, held in Paphos, Cyprus, on 25–28 June 2025.



At the awards ceremony.

The award-winning poster, entitled “Exploring hydrothermal liquefaction of microalgae for sustainable biocrude”, presents the use of microalgae through the hydrothermal liquefaction (HTL) process to produce biocrude. The study focuses on investigating the effect of key operating parameters — such as temperature and residence time — on the yield and quality of the product, contributing to the understanding and optimisation of the process.

The research is being carried out within the European FUELGAE project, and this distinction highlights the importance of research into the use of alternative feedstocks for fuel production and reinforces CPERI’s role in advancing circular-economy and energy-transition technologies.

Relational Capital

The Centre for Research and Technology Hellas systematically cultivates and strengthens its relational and social capital, developing stable and substantial partnerships with institutional bodies, academic and research institutions, and businesses that play a leading role in their fields of activity. Through these synergies, the conditions are created for long-term and mutually beneficial collaborations.

During 2025, the conclusion of significant Memoranda of Cooperation further reinforced this strategic direction, helping to accelerate innovation and create added value for society and the economy, and confirming the decisive role of partnerships in sustainable development.

Investing in regional innovation: Memorandum of Understanding Cooperation between CERTH and the Heroic City of Naoussa



The Memorandum of Understanding was signed on behalf of CERTH by the President of its Board of Directors, Dr Evangelos Bekiaris, and on behalf of the Municipality of the Heroic City of Naoussa by the Mayor, Mr Nikolaos Koutsogiannis, in the presence of the Deputy Minister of Development responsible for research and innovation, Mr Stavros Kalafatis.

With a view to establishing a CERTH branch in the city of Naoussa, a Memorandum of Cooperation was signed in May 2025 between the Research Centre and the Municipality of the Heroic City of Naoussa.



Left: Officials of the Municipality of the Heroic City of Naoussa and representatives of CERTH's Board of Directors.



Right: The Deputy Minister of Development responsible for research and innovation, Mr Stavros Kalafatis

Specifically, the plan provides for the Municipality to grant the use of the traditional Longos-Tourpali building complex, covering 2,300 square metres, to house CERTH's activities, as well as a 100-hectare plot of land for the development of an experimental field.

The new branch aspires to become a hub for research, innovation and collaboration through four key pillars: strengthening local research activity by harnessing the area's existing scientific potential; connecting with local entrepreneurship and transferring know-how; establishing a start-up incubator; and education and training activities.

A Joint CERTH - INTRACOM TELECOM Initiative for Innovation and Digital Transition

With a view to establishing Macedonia as a leading hub for technology, innovation and green industry in South-Eastern Europe, a Memorandum of Cooperation was signed on 12 June between Intracom Telecom and the Centre for Research and Technology Hellas (CERTH).

The two sides will collaborate on initiatives implemented in Macedonia, focusing on sustainable transport, decarbonisation, digital transformation and the upskilling of human resources.



The Chief Executive Officer of INTRACOM TELECOM, Mr. Kartlos Edilashvili, and the President of CERTH's Board of Directors, Dr. Evangelos Bekiaris, at the signing.

CERTH and the University of Western Macedonia join forces for research and innovation in Western Macedonia: A Memorandum of Understanding between the two bodies



The Memorandum of Understanding was signed on behalf of CERTH by the Chairman of its Board of Directors, Dr. Evangelos Bekiaris, and on behalf of the University of Western Macedonia by its Rector, Professor Theodoros Theodoulidis, accompanied by Pantelis Angelidis, Professor in the Department of Electrical and Computer Engineering, and Nikolaos Ploskas, Associate Professor in the Department of Electrical and Computer Engineering.

With a view to establishing Western Macedonia as a point of reference for technology, innovation and green industry in South-Eastern Europe, a Memorandum of Understanding was signed today between the Centre for Research and Technology Hellas (CERTH) and the University of Western Macedonia.

Alongside the Memorandum of Cooperation, the two bodies commit to contributing to the shaping of strategic decisions and roadmaps at national level, with particular emphasis on Western Macedonia, with the aim of harnessing research to the greatest possible extent for the benefit of society, across all relevant and complementary fields.

Memorandum of Understanding between the Conference of Rectors of Greek Universities and the Assembly of Presidents of Research and Technology Organisations

With the aim of strengthening cooperation and mutual support between academic and research bodies in order to upgrade and reinforce the role of organised research at national level, a Memorandum of Understanding was signed on 19 June 2025, at Panteion University, between the Conference of Rectors of Greek Universities and the Assembly of Presidents of Research and Technology Organisations, in the presence of the Deputy Minister of Education, Religious Affairs and Sport, Mr. Nikos Papaioannou.

The main strands of the Memorandum of Cooperation are mutual information-sharing; identifying and strengthening the existing institutional opportunities for cooperation — for both faculty members and researchers — as well as formulating common positions and proposals for improving the relevant institutional framework.

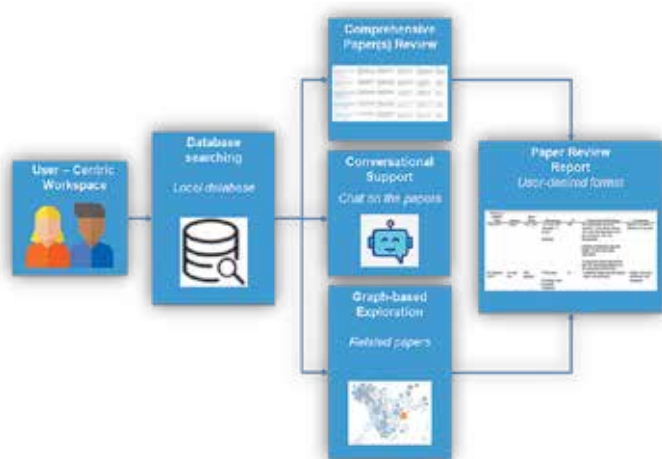


From left to right: Professor Athanasios Katsis, Rector of the University of the Peloponnese; Professor Stylianos Katranidis, Rector of the University of Macedonia; Professor Christina Koulouri, Rector of Panteion University of Social and Political Sciences; Dr. Evangelos Bekiaris, Chairman of CERTH's Board of Directors; Dr. Georgios Nounesis, Chairman of the Board of Directors of NCSR Demokritos; and Dr Vasiliki Georgiadou, Chairman of the Board of Directors of EKKE.

3. COLLABORATION NETWORKS AND THE CULTIVATION OF ENTREPRENEURSHIP

Collaboration with the developing ecosystem

During 2025, the Centre for Research and Technology Hellas successfully completed the project entitled “An integrated tool for systematic literature review in epidemiology”, in collaboration with the open-innovation team of Pfizer’s Digital Innovation Centre.



Integrated tool for the systematic review of scientific literature in epidemiology

This project addressed a challenge that researchers face daily: the enormous volume of scientific information they need to read, understand and combine in order to answer important research questions. Whether designing new medical studies or better understanding diseases, experts often have to review hundreds of articles - a time-consuming and arduous process.

To address this challenge, an innovative digital tool was created that functions like a personal research assistant. Instead of reading each article separately, users can upload documents or search large databases and receive quick, clear summaries of the most important findings.


The system identifies key information, organises studies into structured tables and allows interaction through a natural-language chatbot. In parallel, it provides visualisations of the relationships between studies, revealing patterns and connections that would otherwise be difficult to discern.

The main goal is to make scientific knowledge more accessible and easier to use, without requiring countless hours of reading.

Industrial presence and collaboration with the State

With an emphasis not only on scientific excellence but also on close ties with the market and institutions, the Centre for Research and Technology Hellas significantly strengthened its activity during 2025. Specifically, over the course of 2025 it concluded 59 new service-provision projects, further expanding its network at national and international level.

With the bridging of research and the real economy as a key principle, CERTH enhanced its portfolio with new strategic partnerships, while maintaining and developing



successful existing collaborations. In doing so, it further consolidated its position both within the Greek innovation ecosystem and in the global industrial arena.

Collaborations in the field of Clean Energy

The collaborations of CERTH's Chemical Process and Energy Resources Institute (CPERI) with industry in the field of the environment and clean energy continued dynamically throughout 2025. More specifically, collaborations with the multinational energy companies CHEVRON, EXXON MOBIL, ARAMCO and PERTAMINA, and with the catalyst-manufacturer Dorf Ketal Chemicals Malaysia SDNB, continued to bear fruit, while at the same time new partnerships were established with BASF CORPORATION, a chemical-products manufacturer with which CERTH has collaborated for many years. In addition, new collaborations were launched during the year, such as the one with GIVAUDAN FRANCE SAS - a manufacturer of innovative solutions for food and for beauty and wellness products - as well as with TESLA GREECE, a manufacturer of electrical-technology products.

Partnerships in the field of Information and Communication Technologies

With the same momentum, in 2025 CERTH continued to strengthen its strategic partnerships in the field of advanced Information and Communication Technologies, both with international technology leaders such as Samsung and with major businesses from different sectors - such as the TITAN Group, Coca-Cola and KLEEMANN - deepening their collaboration and developing joint activities with multi-level impact.

Collaborations with public bodies in the field of Transport and Smart Mobility

CERTH continued to provide practical support to the Ministry of Infrastructure and Transport, the Region of Central Macedonia, the Thessaloniki Traffic Police and the municipalities of the urban complex, providing citizens with timely and reliable information on traffic conditions on the Thessaloniki Ring Road during the construction of the Flyover. Within this framework, CERTH — drawing on traffic-measurement systems installed in the field, telematics data from a taxi fleet and data provided as part of its collaboration with Google, as well as other data providers — continued to provide the flyover.imet.gr traveller-information service as well as the DriveThess smartphone application.

Collaborations in the field of health and agri-food

During 2025, CERTH's collaborations with the pharmaceutical companies ELPEN, AstraZeneca, Novartis, Gilead, Roche, Janssen, Lilly, BMS and AbbVie were substantially expanded. In parallel, CERTH — as the national hub of the European research infrastructure ECRIN for supporting multinational clinical trials, and as coordinator



of the Greek Clinical Research Network (GRECRIN) — maintained a strong and active role in the field of clinical research.

The memorandum of cooperation signed by INAB with the Hellenic Society of Pharmacoepidemiology (ELEFEP) represents a significant strategic opportunity to advance research, regulatory practice and innovation in the field of health in Greece. Specifically, the memorandum aims to strengthen scientific capacity in the field of pharmacoepidemiology, to harness the research infrastructure and expertise of INAB/CERTH, and to support activities linked to the shaping of public-health policies.

In addition, the memorandum of cooperation between the Institute of Applied Biosciences (INAB) and the INTERNATIONAL BARCODE OF LIFE Corporation (iBOL) — the international scientific consortium aiming to create an integrated Earth-observation system for discovering, identifying and recording global biodiversity — was renewed.

The same year saw the launch of the BioTailoring project, which focuses on the study and analysis of industrial yeast strains (*Saccharomyces cerevisiae* and *Yarrowia lipolytica*). The project's aim is to redesign and optimally harness these strains for the development of innovative and competitive biotechnology applications, with an emphasis on producing valuable chemical compounds, such as terpenoids, from waste-derived feedstocks.

In parallel, the eCAN Plus project was launched — a Joint Action between 23 EU Member States and 83 partners, including public-health institutes, universities, hospitals, oncology centres and patient associations. The project's aim is to build on the experience of the previous JA eCAN action to strengthen the digital capabilities of oncology centres in the European Union, with particular emphasis on the countries of Eastern Europe. Within this framework, INAB will help develop an integrated and secure environment for testing and piloting digital tools, in full compliance with the European regulatory framework, with the aim of improving the use and reuse of health data for the benefit of cancer patients.

In 2025, the CANDLE project was also launched, supporting the development of National Cancer Data Nodes (NCDNs), interconnected with the European platforms UNCAN.eu and the European Cancer Patient Digital Centre (ECPDC). The project contributes to achieving the goals of the EU's Cancer Mission, enhancing understanding of the disease, the potential for early diagnosis and the optimisation of treatment, as well as improving patients' quality of life, in alignment with Europe's Beating Cancer Plan.

In addition, the NEUROHEALTH project was launched, investigating plants and fungi that contain alkaloids, with the aim of developing innovative dietary supplements with neuroprotective properties. The research focuses on isolating and characterising alkaloids with limited psychoactivity and documented protective action on the central nervous system. Through modern extraction and analysis methods, the aim

is to identify compounds that help reduce the oxidative stress, inflammation and neurodegeneration associated with neurodegenerative diseases such as Alzheimer's and Parkinson's.

Finally, the BioExcellence project was approved by the Region of Central Macedonia and its implementation began. The project concerns the development of research infrastructure for innovative applications in the fields of health and nutrition. Its aim is to bridge the gap between research excellence in biomedicine and agri-biotechnology and applications that respond to market needs. Upgrading the existing infrastructure of INAB/CERTH is expected to significantly strengthen research capabilities, enabling the development of new methodologies, products and services of high added value.

Technology Transfer

From research to market

In 2025, CERTH's Technology Transfer Office (TTO) recorded significant activity across all strands of its mission. In the field of Intellectual Property, several new inventions were recorded, while 4 patent applications were filed (3 national applications with OBI and 1 with the EPO) and 3 new patents were granted, bringing the total number of active patents to 43. In the field of commercialisation, the Centre concluded 3 licensing agreements and 4 new collaborative-research agreements with industry. Twenty-one CERTH spin-off companies continued their operations, with some of them developing even more intense commercial activity. To this end, the TTO provided support by organising 9 meetings with teams from venture-capital firms.

In parallel, in 2025 the CERTH TTO continued its policy of outward orientation and networking. Through the provision of Technology Transfer services to third parties, active involvement in the activities of the National Network of Technology Transfer Offices (ME-TEX), and collaboration with the TTOs of other European academic and research organisations within European projects, CERTH's TTO continued to cultivate a spirit of outward orientation and genuine connection with society and the



Comprehensive tool for systematic literature review in epidemiology.

market. Finally, the approval of the proposal to fund the operation of the SPIRA+ Network — coordinated by CERTH's TTO, with the TTOs of AUTH, IHU, UoM and UoWM as members — laid the foundations for enhanced technology-transfer services in the ecosystem of the wider region over a four-year horizon.

Spin-off Companies

During 2024, the spin-off companies of the Centre for Research and Technology Hellas demonstrated particularly dynamic activity, strengthening their business growth, expanding their collaborations and earning significant distinctions in their fields of operation.

COMPLAGO - Developing a regulatory-intelligence framework

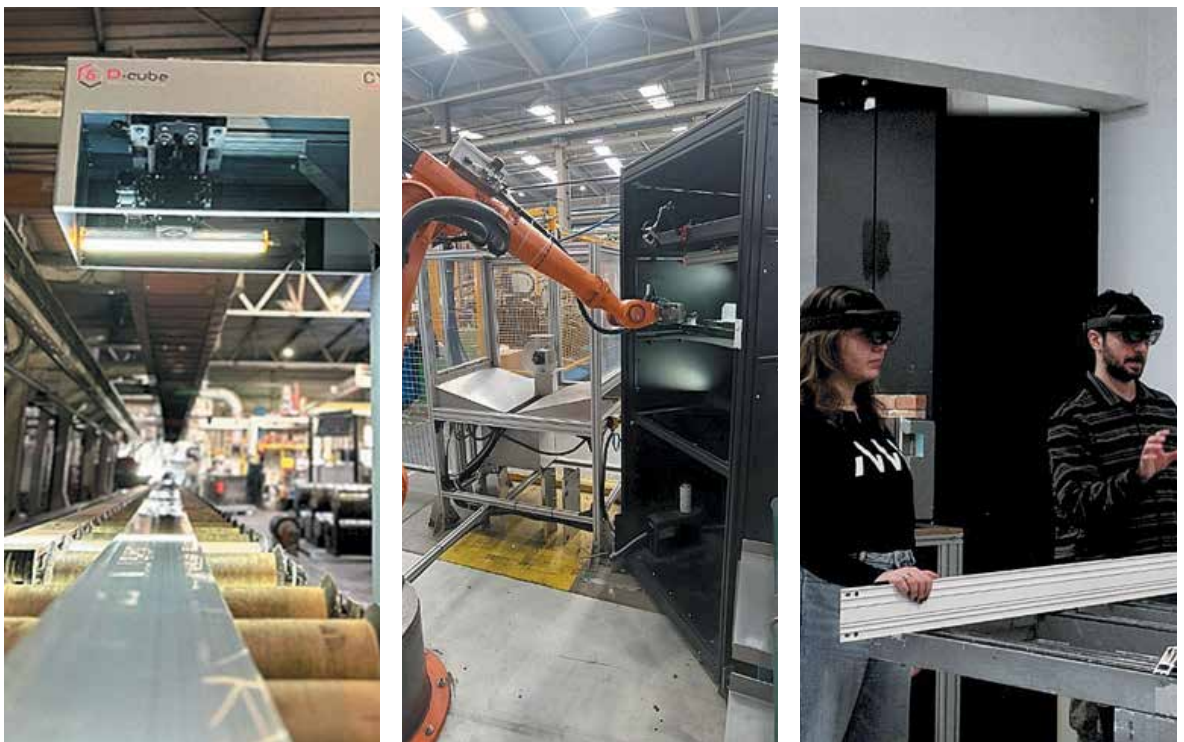


From left to right: Thodoris Semertzidis, Stefanos Demertzis, Michalis Lazaridis, Tasos Dimou and Petros Daras.

COMPLAGO was actively engaged during 2025 in developing a regulatory-compliance framework for sectors with a strict regulatory environment. More specifically, the company is working with industry to develop a regulatory-intelligence and compliance-monitoring framework capable of monitoring public regulatory repositories and identifying the applicable requirements. The framework will oversee how these requirements are applied through established procedures and will verify the compliance of end products. To this end, it harnesses a combination of innovative computer-vision and agentic-AI solutions, offering SaaS applications.

COMPLAGO has developed strategic partnerships with major companies in Greece operating in sectors such as chemicals, food, retail and telecommunications. The company develops solutions targeting both sector-specific needs - such as product compliance, safety monitoring, and process modelling and optimisation - and horizontal needs, such as risk governance and digital transformation. COMPLAGO aims to develop and deploy its solutions both as Proof-of-Concept and as production-ready tools on its clients' premises.

D-Cube: Strengthening its position in the BENELUX market and collaboration with the Viohalco group



D-Cube is expanding its international footprint, leading the way to the next generation of smart industrial systems that follow the From Detection to Decision philosophy.

2025 confirmed D-cube as one of the most dynamically growing companies in the field of smart industrial systems, marking a year of international expansion, technological leadership and high-value strategic partnerships.

The strengthening of its presence in the BENELUX market - with the successful installation of the CYRUS Surface Inspection System at the E-MAX group, combined with its participation in the Surface Inspection Summit 2025 in Aachen, alongside the world's leading Machine Vision manufacturers - decisively reinforced the company's international footprint and recognition.

In parallel, the strategic collaboration with the Viohalco group to develop smart aluminium-coil sorting solutions, as well as the application of CYRUS to copper extrusion using artificial-intelligence technologies, established D-cube as a pioneer in the next generation of industrial systems — systems that go beyond detecting defects to turning data into immediate, reliable decisions, in line with the “From Detection to Decision” philosophy.

As part of the continuous upgrading of its solutions portfolio, D-cube - in collaboration with the Architectural Aluminium Academy of the Alumil group - developed innovative XR (Extended Reality) solutions, redefining training in the assembly of aluminium systems. Through remote experiential training, artificial intelligence and digital twins, knowledge becomes more immediate, more efficient and fully scalable.

Finally, D-cube continued to invest systematically in building a strong international sales network, consolidating its presence in North America through its collaboration with Williamson Corporation, a Massachusetts-based organisation with long-standing international experience in infrared temperature-measurement systems for the metals industry.

Optimems – A dynamic trajectory and distinctions

Optimems, a CERTH spin-off in the EnergyTech sector, is a model of successfully connecting cutting-edge research with the market. Developing digital solutions for optimising energy infrastructure, the company achieved a milestone: within just a few months of commercial activity, it captured the top sales position in the Greek market, with its technologies now applied in more than 1,200 energy parks.

This dynamic trajectory is accompanied by significant distinctions that highlight the high calibre of CERTH’s human resources. Four members of the founding team - Angelina Bintoudi, Dimitris Karanassos, Lampros Zygklakis and Christos Timplalexis - were included in the 40 Under 40 list, while the company’s CEO was honoured with the title of Startup Manager of the Year 2025.



A distinction for the CEO of Optimems, Angelina Bintoudi, who was honoured with the title of Startup Manager of the Year by the Manager of the Year institution.



Left: Optimems advancing in the PITCH competition at Web Summit Vancouver 2025.

Right: Optimems in first place in Greece at the 15th NBG Business Seeds Innovation and Technology Competition of the National Bank of Greece

At international level, Optimems consolidated its position as a leading deep-tech company, securing a place among the Top 10 startups at Web Summit Vancouver and 1st place in the NBG Seeds programme. The success of Optimems is concrete proof of CERTH’s role as a catalyst for innovation, turning research excellence into solutions with a substantial impact on the energy transition.

CDXi solutions CDXi solutions: Strengthening its commercial offering

During 2025, CDXi solutions increased its mature commercial offerings, developed its network and promoted its products through participation in innovation competitions, trade fairs and conferences related to its activities. More specifically, it renewed its contract with the industrial company ALUMIL for the installation and operation of the innovative CDXi Aluminium solution, which provides information on the progress of the recycled-aluminium melting process within an industrial foundry furnace, with the aim of optimising energy efficiency, reducing recycled-aluminium losses and overall enhancing the efficiency of ALUMIL’s aluminium-recycling process. CDXi solutions

At the same time, during 2025 it was awarded a contract by the Region of Central Macedonia, providing scientific services through the implementation of advanced methodologies, geospatial analyses and integrated data flows, harnessing the CLIMAAX toolkit to assess climate risks and support decision-making in addressing climate challenges.

Equally significant is the fact that CDXi took part in the innovation competition of Water Europe - one of the largest organisations in Europe dedicated to promoting innovations, research, technology and products related to the water value chain - and managed to win first prize in the Digital Water category with its CDXi Water solution. The CDXi Water



Left: The award – a significant distinction for the trajectory and growth of CDXi solutions.

Right: The co-founder of CDXi, Dr. Ilias Gialampoukidis, receiving the award at the innovation competition of the Water Europe organisation.

system reached high levels of business and investment maturity, which enabled it to successfully graduate from the European Space Agency's incubator (ESA BIC) in June 2025 and to receive the Start-Up of the Year 2025 award in a competition organised by EARSC, the largest industrial association of remote-sensing and Earth-observation companies in Europe.

OZZIE Robotics collaborates with the TITAN group on a pilot application of robotic systems in an industrial environment

CERTH's spin-off company OZZIE Robotics carried out a collaboration with TITAN during 2025, focused on developing and pilot-testing an autonomous mobile robotic platform in a real industrial environment.

The OZZIE Rover robotic platform was used to collect and analyse data from critical points of the production process - such as temperature measurements in industrial furnaces, motors and other infrastructure of heightened operational importance - with the aim of identifying operational anomalies early and supporting preventive maintenance practices. In parallel, the system provided data on the application of safety rules on the factory floor, including the use of personal protective equipment (e.g. helmets, safety vests), the speed of industrial vehicles and the condition of the facility perimeter (e.g. detecting damage or breaks in the fencing).



The OZZIE Rover robotic platform.

The pilot application was carried out as part of collaborative operation with other heterogeneous robotic systems - such as aerial and quadruped robots from different organisations - as well as in close collaboration with CERTH research teams, highlighting the potential for the combined use of multiple robotic assets in complex industrial environments.

4. IMPACT

Strengthening the domestic economy

For yet another year, CERTH produced scientific work with a significant economic footprint, confirming that public funding of applied technological research is not merely an expense, but a substantial investment that creates value and delivers benefits for the State, citizens and society as a whole.

With the Research Centre's turnover reaching €64.9 million for 2025 and the institutional state grant standing at just 7.8% of total turnover, it follows that the direct contribution to the local economy is around €60 million.

Growth that prioritises the environment

Energy upgrade of two CERTH buildings

With the improvement of its environmental practices as a central principle, the energy upgrade of the buildings of the Hellenic Institute of Transport (HIT) and of the branch of the Chemical Process and Energy Resources Institute in Ptolemaida was completed during 2025. These two energy-upgrade projects, carried out within CERTH 2.0, highlight CERTH's commitment to "smarter" and more sustainable buildings, with modern solutions that reduce energy consumption and improve day-to-day operation.

More specifically, the HIT building was upgraded from energy category D to the top category A+, through targeted interventions that improve its performance and significantly reduce energy consumption.

At the same time, the CPERI building in Ptolemaida was upgraded from energy category B to A+, through interventions that enhance energy savings and the use of renewable energy sources.

These interventions significantly reduce the need to draw energy from the grid, improve the building's energy footprint and make use of environmentally friendly materials.

Projects and collaborations with sustainability as a strategic principle

In 2025, the Research Centre once again focused on delivering a wide portfolio of research projects that embed the principles of sustainable development at every stage. Guided by the efficient use of natural resources, the improvement of energy efficiency, the reduction of the environmental footprint and the protection of biodiversity, CERTH developed innovative solutions and technologies that make a substantial contribution to sustainable development and to addressing contemporary environmental challenges.

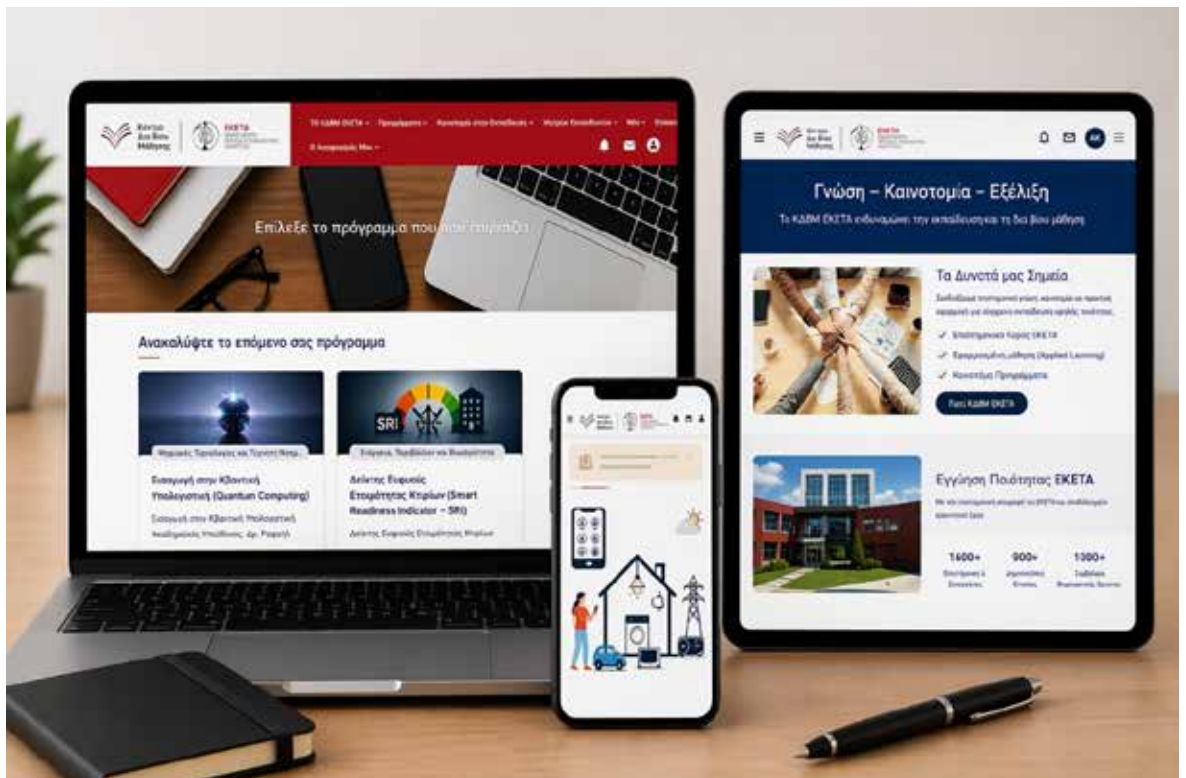
Strengthening industry and private initiative

Given that innovation is a key factor in enhancing the competitiveness of businesses, in 2025 CERTH developed extensive collaboration activity with industry, small and medium-sized enterprises and the public sector, making a substantial contribution to their technological modernisation.

Harnessing its scientific excellence and modern research infrastructure, CERTH supported the technological development of its partner organisations, strengthening their position in the market. Through the transfer of know-how and the application of innovative solutions, it contributed both to the development of new high-value technologies and to the optimisation of existing products and processes, leading to a substantial improvement in the operation and efficiency of businesses.

This momentum is also reflected in the activity indicators: for 2025, 59 new service-provision projects are recorded, while the total number of active projects stands at 165.

CERTH Lifelong Learning Centre: A new structure for education and the transfer of know-how



The website and educational platform (Moodle) of CERTH's Lifelong Learning Centre, developed during 2025.

During 2025, CERTH completed the institutional establishment of its Lifelong Learning Centre (LLC), which was granted Level 2 operating accreditation by the National

Organisation for the Certification of Qualifications and Vocational Guidance (EOPPEP) in October. This accreditation marked an important milestone in the development of a structured framework for the provision of lifelong learning services, capitalizing on CERTH's research expertise and technological know-how.

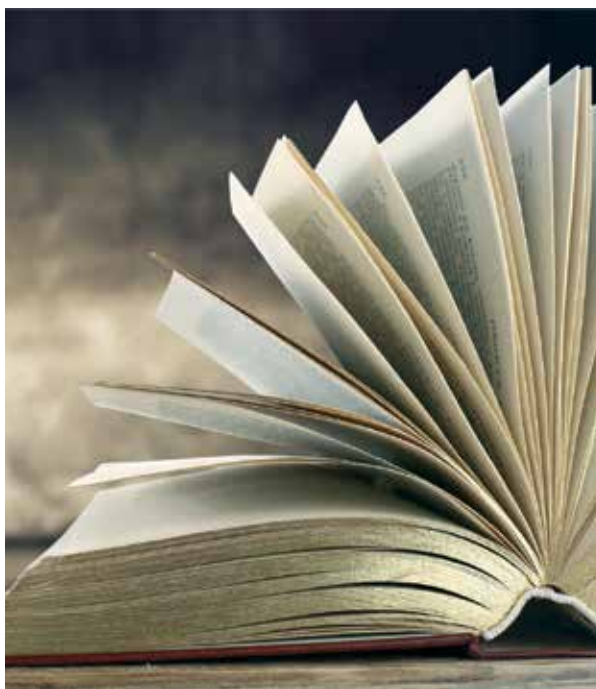
During 2026, the Lifelong Learning Centre is expected to become fully operational through its dedicated website and learning management platform (Moodle), which will support information services, registrations and the delivery of training programmes. The first training programmes have been designed in the fields of "Energy, Environment and Sustainability" and "Digital Technologies and Artificial Intelligence", while the launch of the first training cycles is scheduled within the same year.

The Lifelong Learning Centre is expected to serve as an important mechanism for strengthening the link between research, society and the labour market, enhancing the transfer of knowledge and expertise from CERTH to professionals, businesses, researchers and broader target groups. Through educational programmes aligned with the Centre's research activities, it will contribute to upskilling and reskilling efforts at both regional and national levels, while also expanding access to knowledge through modern digital tools.

High-quality research

CERTH's published output in 2025 remained stable compared with the previous year, while its reach within the international scientific community recorded a significant increase, rising by around 28% compared with 2024.

Throughout the year, CERTH maintained a high level of scientific output, confirming its continuous presence at the cutting edge of research developments. Through its activity, it made a substantial contribution to advancing innovation and technological progress, addressing critical social challenges, and strengthening scientific knowledge and trust in research and technology.



Of particular significance is the fact that, based on data compiled by Stanford University in the United States and published by the internationally recognised publisher Elsevier, fifteen CERTH researchers are among the most influential scientists worldwide, judged by the impact of their published work.

Responsible research and innovation

Information Security as a Strategic Pillar of Growth

Guided by the goal of safeguarding its smooth operation, in 2025 CERTH invested in developing and implementing an integrated Information Security and Personal Data Protection Management System, placing security at the core of its responsible development and innovation.




Certification of CERTH in accordance with the international standards ISO 27001 and ISO 27701.

The approach was based on systematic risk analysis, the mapping of information and data flows, and the recording and redesign of critical processes.

In parallel, the principles of information security and data protection were embedded from the design stage (security and privacy by design), while a coherent framework of policies, controls and monitoring mechanisms was developed.

Particular emphasis was placed on cultivating a strong security culture, through targeted training and awareness-raising activities for staff, as well as on the continuous assessment and improvement of the system's effectiveness.

This undertaking goes beyond the bounds of regulatory compliance, substantially strengthening the organisation's resilience, transparency and reliability.



At the same time, the conditions are actively being created for a safe and stable environment for developing and harnessing research and innovation activities, on terms of sustainability and competitiveness.

The completeness and effectiveness of the system were confirmed through successful certification to ISO/IEC 27001:2022 and ISO/IEC 27701:2019 by TUV Nord Hellas, sealing CERTH's full alignment with the most recognised international standards and best practices in the field of information security and personal-data protection.

Strengthening integrity through Digital Tools

As part of strengthening transparency and compliance with the applicable regulatory framework, CERTH is developing a modern online reporting platform, which is already at the implementation stage.

The platform will enable employees, as well as anyone falling within the scope of the relevant Policy, to submit reports on incidents that have come to their attention, whether these concern whistleblowing matters or other breaches of regulations and legislation.

Particular emphasis is placed on ensuring the confidentiality of reports, while the option of anonymous submission will also be provided, should the reporting person so wish. In parallel, appropriate measures are being adopted to protect reporting persons from any form of retaliation.

The platform will be accompanied by clear instructions on the reporting procedure, as well as defined steps for the proper receipt, handling and assessment of reports.

The development of such a mechanism is considered crucial, as it strengthens accountability, fosters a culture of integrity and enables the timely identification and handling of potential irregularities before they escalate. At the same time, it helps build trust between the Research Centre and its people, ensuring a safe and reliable working environment.

Investing in CERTH's Human Resources

Responding to the need for more organised and integrated management and support of its human resources, in 2025 CERTH established a Human Resources (HR) Office, which reports to the Directorate of Administrative Services of the Central Directorate.

The Office aims to shape a fair, modern and inclusive working environment, placing particular emphasis on employees' professional development and on strengthening collaboration.

Within its remit, it will provide a set of services covering the entire human-resources management cycle, such as the onboarding and integration of new employees, the recording and analysis of training needs, the design and implementation of training activities, and the assessment of staff satisfaction. In parallel, it supports the appraisal process, manages requests and reports through the MyCERTH system, and contributes to the strategic planning of related policies and activities.

In addition, the creation and continuous updating of a dedicated section on CERTH's website is planned, through which useful information and support tools will be provided to staff.

Cultivating a scientific culture

With a steady commitment to the importance of communicating with and informing citizens about technological research, CERTH consistently invests in showcasing and promoting its scientific activity to the general public, helping to build understanding of the benefits it brings.

A very important activity in this direction is the "Researchers' Night", a pan-European initiative that CERTH has coordinated in Thessaloniki for more than ten years, promoting the dissemination of scientific knowledge through a rich programme of creative and interactive activities.

In 2025, the "Researchers' Night" was held, as every year, in Thessaloniki, Athens, Patras, Larissa, Heraklion and Rethymno, attracting more than 5,000 visitors in Thessaloniki and more than 29,000 in total across the six cities, who had the opportunity to get a close-up look at the world of research and science.



During the European Researchers' Night in Thessaloniki at the Thessaloniki Concert Hall.



Left: A visit by a CERTH researcher to schools.

Right: A guided tour for pupils of CERTH's Agile.40 research infrastructure.

In addition, more than 500 pupils got a close-up look at the world of research through researchers' visits to schools, while others took part in experiential mentoring programmes and guided tours of the Centre's facilities. At the same time, through activities such as the Chat Lab, more than 2,000 pupils had the opportunity to talk directly with researchers, while the Researchers' Registry now forms a stable bridge connecting schools with the scientific community. Once again, these initiatives made a substantial contribution to disseminating scientific knowledge and cultivating an interest in research among younger generations.

5. GOALS 2026



01

Maintaining and strengthening research excellence

Maintaining CERTH's excellence across the full spectrum of its research activity is a key priority for 2026. The Centre will continue to emphasise high-quality, innovative research, with the aim of producing high-value technologies and solutions in fields such as Industry 4.0, clean energy, smart cities, health and agri-robotics. In parallel, the upgrading of its research infrastructure will continue at an intensive pace, strengthening the Centre's international competitiveness and scientific impact.

02

Targeted strengthening of human resources

CERTH will continue to invest strategically in strengthening its human resources, with the aim of attracting and retaining high-calibre scientific staff from Greece and abroad. The creation of new jobs in strategic areas will support the expansion of research activities, the strengthening of interdisciplinary collaboration and the shaping of an even more internationalised and dynamic research environment.


03

Strengthening initiatives on the basis of the Sustainable Development Goals

Sustainable development is a key pillar of CERTH's strategy for 2026. The Centre will further strengthen its activities to reduce its environmental and energy footprint, develop green technologies and apply innovative energy-management solutions. The interventions already under way in energy infrastructure are part of an overall path towards green transformation.

04

Innovation focused on the current market and future needs

The Centre continues to develop technologies that respond not only to current market needs but also to future developments. With an emphasis on sustainability, flexibility and technological maturity, CERTH aims to further strengthen its role as a provider of solutions with real economic and social impact.

05

Further expanding strategic partnerships and international innovation networks

CERTH will continue to expand its network of partners, with an emphasis on strategic, long-term, high-value collaborations. Participation in competitive European projects and international consortia strengthens its scientific presence and contributes to its steady consolidation as a reliable international research partner.



06

Technological maturation and accelerating the exploitation of research

CERTH is strengthening its role as a body that turns research into applied solutions. Its strategy focuses on accelerating technology transfer, increasing patents and commercialisation (licensing) agreements, and developing spin-offs, with the aim of creating a stronger link between research and the market.

07

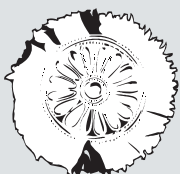
Showcasing and strengthening CERTH as an employer of excellence

CERTH will continue to invest in its people, cultivating an environment that promotes meritocracy, collaboration and creativity. With an emphasis on transparency, the fair recognition of effort and equal opportunities for all, the Centre seeks to further strengthen the relationship of trust with its human resources. In parallel, through modern management practices and the continuous improvement of its organisational operation, CERTH aspires to shape a working environment that inspires, encourages development and strengthens the collective journey towards excellence and innovation.

08

Organisational expansion and strengthened outward orientation in Greece and Europe

Strengthening CERTH's outward orientation is a strategic priority for 2026, with a parallel emphasis on its organisational development through the creation and strengthening of branches, institutes and offices in Greece and Europe. The aim is to further consolidate the Centre's presence in selected regions of the country in order to strengthen regional innovation, as well as to develop European hubs in strategic locations such as Brussels, so as to strengthen ties with institutional bodies and research networks and to enhance its international presence overall.



CERTH
CENTRE
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2025
ANNUAL REPORT

Cover image by yogiermansyah22 on Magnific