Fraunhofer PORTUGAL

ASSOCIAÇÃO FRAUNHOFER PORTUGAL RESEARCH

ANNUAL REPORT 2024

ANNUAL REPORT 2024

Associação Fraunhofer Portugal Research
Rua Alfredo Allen 455/461, 4200-135 Porto, PORTUGAL

Contents

1 Associação Fraunhofer Portugal Research 7
1.1 Associação Fraunhofer Portugal Research 7
1.2 Editorial (Message from the Chair) 8

2 Fraunhofer Portugal 13
2.1 Overview of Fraunhofer Portugal 13
2.1.1 Vision – A Driving Force in Innovation 13
2.1.2 Mission – Research of Practical Utility 13
2.1.3 Funding Model 14
2.1.4 Business Model 15

3 Governance & Management 19
3.1 Governance Structure 19
3.2 Management 19
3.2.1 Supervisory Board 19
3.2.2 Executive Board 20

4 Research by Fraunhofer Portugal 23
4.1 FhP-AICOS 23
4.2 Highlights 24
4.2.1 Events 25
4.2.2 Awards 34
4.3 FhP-AWAM 39
4.4 Highlights 39

5 Impact Assessment of Research Excellence 45
5.1 Scientific Production 45
5.2 Job Creation and Capacity Building 46
5.3 Public Engagement 47
5.4 Fraunhofer Portugal in Numbers 49

6 Management Report 2024 51
6.1 Economic and Political Background 51
6.2 Employees 52
6.3 Risks and Risk Management 53
6.4 Management Report 2024 – FhP-AICOS 54
6.4.1 Summary of Key Figures and Ratios 54
6.4.2 Business Evolution 55
6.5 Management Report 2024 – FhP-AWAM 56
6.5.1 Summary of Key Figures and Ratios 56
6.5.2 Business Evolution 57
6.6 Outlook and Strategic Development 58

Acronyms 61

1
Associação Fraunhofer Portugal Research

1.1
Associação Fraunhofer Portugal Research

Research of Practical Utility lies at the heart of all activities developed by Fraunhofer Portugal

Founded in 2008 by the Fraunhofer-Gesellschaft and the German-Portuguese Chamber of Commerce and Industry (CCILA) – within the framework of a long-term Portuguese-German collaboration to explore mutual interests in science and technology – Associação Fraunhofer Portugal Research (Fraunhofer Portugal) has the mission to undertake applied research of direct utility to private and public enterprises and of wide benefit to society.

Fraunhofer Portugal currently materialises itself through its two centres: the Fraunhofer Portugal Research Centre for Assistive Information and Communication Solutions (FhP-AICOS), located in Porto and Lisbon, founded in 2009 following a partnership between the Fraunhofer-Gesellschaft, the Foundation for Science and Technology (FCT) and the University of Porto (UP), and the Fraunhofer Centre for Advanced Water, Energy and Resource Management (FhP-AWAM), founded in 2019 in partnership between Fraunhofer-Gesellschaft, Fraunhofer Portugal, the Foundation for Science and Technology (FCT), the University of Trás-os-Montes e Alto Douro (UTAD) and the University of Évora (UÉ), located in Vila Real and Évora.

In 2010, Fraunhofer Portugal has been acknowledged by the Portuguese Government as an 'Entity of Public Utility'.

A investigação de utilidade prática está no centro de todas as atividades desenvolvidas pela Fraunhofer Portugal

Fundada em 2008 pela Fraunhofer-Gesellschaft e pela Câmara de Comércio e Indústria Luso-Alemã (CCILA) – no âmbito de uma colaboração de longo prazo entre Portugal e Alemanha para explorar mútuos interesses em ciência e tecnologia – a Associação Fraunhofer Portugal Research (Fraunhofer Portugal) tem como missão desenvolver investigação aplicada de utilidade prática, para organizações privadas e públicas, com amplos benefícios para a sociedade.

Presentemente, a Fraunhofer Portugal materializa-se através dos seus dois centros de investigação: o Fraunhofer Portugal Research Center for Assistive Information and Communication Solutions (FhP-AICOS), localizado no Porto e Lisboa, criado em 2009 fruto de uma parceria entre a Fraunhofer-Gesellschaft, a Fundação para a Ciência e a Tecnologia (FCT) e a Universidade do Porto (UP), e o Fraunhofer Centre for Advanced Water, Energy and Resource Management (FhP-AWAM), criado em 2019 fruto de uma parceria entre a Fraunhofer-Gesellschaft, a Fraunhofer Portugal, a Fundação para a Ciência e Tecnologia (FCT), a Universidade de Trás-os-Montes e Alto Douro (UTAD) e a Universidade de Évora (UÉ), localizado em Vila Real e Évora.

Em 2010, a Fraunhofer Portugal foi reconhecida pelo Estado Português como "Pessoa Coletiva de Utilidade Pública".

1.2 Editorial (Message from the Chair)

Fraunhofer Portugal: 15 years of driving innovation for the benefit of society

Looking back to the very beginning of the creation of Fraunhofer Portugal, it would be difficult to imagine all the added value that our organization has been able to create in the Portuguese scientific ecosystem. The challenge was enormous, to prove that the well-known Fraunhofer model was feasible to be implemented in Portugal, but as the results show, not only we've been able to prove that this model is feasible, but also that applied science Made in Portugal is at the same level of excellence as any other country in the world! This has been an intense journey, with many challenges and obstacles arising along the way, but when you have a highly professional and motivated team, you can surpass any difficulty, and that's what our team has proven along these 15 years of success stories that we have shared with our community.

In order to be prosperous and grow, it's necessary to secure the basic funding that will provide the financial means to develop the essential spirit of Fraunhofer Portugal: the pre-competitive research that will fuel the most innovative projects and provide the necessary know-how and technology that European companies need to be globally competitive. In fact, looking at the current geopolitical context, I would dare to say that we've never been in such a competitive environment as we are today, where Europe urgently needs to maintain its position as an innovation leader! The last few years have been extremely challenging, with enormous changes in the economic and political environment, with several nations around the world making massive investments to catch the wave of technological developments and gain a unique position that allows them to influence and control the technological frameworks and IP that can dictate the success, or failure, of their economies. Topics such as Artificial Intelligence, Cyber-Physical Systems, Human-Computer Interaction, Water, Energy and Resource Valorization are at the core of the knowledge that is crucial to succeed in today's scientific and economic landscape, and never before has Fraunhofer Portugal, through its research centers, been so well positioned to play a decisive and definitive role in the local and European landscape, driving the knowledge, people and innovations necessary to succeed.

In this sense, 2024 once again showed the capacity that exists within our organization, as both centers, FhP-AICOS and FhP-AWAM, were very successful in their performances, leading to a total business volume of 6,3M€ and a total project revenue of 4,1M€, being 1,8M€ of industry revenue. To highlight the main achievements of 2024, the two major European projects acquired by FhP-AICOS and the fully operational environment of the FhP-AWAM laboratories in Vila Real were probably the key success factors that allowed both centers to increase their revenue, which naturally led to an increase in the scientific staff supporting the implementation of R&D initiatives in both centers.

Finally, a word of sincere gratitude to that special element that once again has allowed us to share these outstanding results with our stakeholders: People! Everyone, without exception, has contributed to these amazing results! It's thanks to their dedication, commitment, spirit of innovation and willingness to work together that we have been able to achieve a significant part of the goals we set for our organization, and now it's time to celebrate together another year of awards, victories and conquests that make us all proud to work in such a prestigious organization!

The responsibility is enormous, and we have significant challenges ahead of us, but I'm confident that together we will continue to write this amazing success story of Fraunhofer Portugal!

Pedro Almeida
President of the Executive Board

Editorial (PT)

Fraunhofer Portugal: 15 anos a impulsionar a inovação em benefício da sociedade

Olhando para os primórdios da Fraunhofer Portugal, é difícil imaginar o valor acrescentado que a nossa organização tem sido capaz de criar no ecossistema científico português. O desafio era enorme, provar que o famoso modelo Fraunhofer podia ser implementado em Portugal, mas como os resultados mostram, conseguimos provar não só que este modelo é viável, mas também que a ciência aplicada feita em Portugal está ao mesmo nível de excelência que qualquer outro país do mundo! Este foi um percurso intenso, com muitos desafios e obstáculos pelo caminho, mas quando se tem uma equipa altamente profissional e motivada, é possível ultrapassar qualquer dificuldade, e é isso que a nossa equipa tem provado ao longo destes 15 anos de histórias de sucesso que temos partilhado com a nossa comunidade.

Para prosperar e crescer, é necessário assegurar o financiamento de base que permita desenvolver o espírito essencial da Fraunhofer Portugal: a investigação pré-competitiva que alimentará os projetos mais inovadores e fornecerá o know-how e a tecnologia necessários para que as empresas europeias sejam globalmente competitivas. De facto, olhando para o atual contexto geopolítico, atrever-me-ia a dizer que nunca estivemos num ambiente tão competitivo como o atual, onde a Europa precisa urgentemente de manter a sua posição de líder em inovação! Os últimos anos têm sido extremamente desafiantes, com enormes mudanças no ambiente económico e político, com várias nações em todo o mundo a fazerem investimentos maciços para apanhar a onda dos desenvolvimentos tecnológicos e ganhar uma posição única que lhes permita influenciar e controlar os quadros tecnológicos e a PI que podem ditar o sucesso, ou o fracasso, das suas economias. Temas como Inteligência Artificial, Sistemas Ciberfísicos, Interação Humano-Computador, Água, Energia e Valorização de Recursos estão no cerne do conhecimento que é crucial para ter sucesso no panorama científico e económico atual, e nunca antes a Fraunhofer Portugal, através dos seus centros de investigação, esteve tão bem posicionada para desempenhar um papel decisivo e definitivo no panorama local e europeu, impulsionando o conhecimento, as pessoas e as inovações necessárias para ter sucesso.

Neste sentido, 2024 mostrou mais uma vez a capacidade que existe dentro da nossa organização, pois ambos os centros, FhP-AICOS e FhP-AWAM, foram muito bem-sucedidos nos seus desempenhos, levando a um volume total de negócios de 6,3M€ e a uma receita total de projetos de 4,1M€, sendo a receita da indústria de 1,8M€. Para destacar as principais realizações de 2024, os dois grandes projetos europeus adquiridos pelo FhP-AICOS e o ambiente totalmente operacional dos laboratórios FhP-AWAM em Vila Real foram provavelmente os principais fatores de sucesso que permitiram a ambos os centros aumentar as suas receitas, o que naturalmente levou a um aumento do pessoal científico que apoia a implementação de iniciativas de I&D em ambos os centros.

Por fim, uma palavra de sincero agradecimento àquele elemento especial que nos permitiu, mais uma vez, partilhar estes excelentes resultados com os nossos parceiros estratégicos: As pessoas! Todos, sem exceção, contribuíram para estes resultados extraordinários! Foi graças à sua dedicação, empenho, espírito de inovação e vontade de trabalhar em equipa que conseguimos atingir uma parte significativa dos objetivos a que nos propusemos, e agora é tempo de celebrarmos juntos mais um ano de prémios, vitórias e conquistas que tanto orgulho nos trazem por trabalharmos numa organização tão prestigiada!

A responsabilidade é enorme e temos desafios significativos pela frente, mas estou confiante de que juntos continuaremos a escrever esta fantástica história de sucesso da Fraunhofer Portugal!

Pedro Almeida
Presidente da Direção


DELL

2
Fraunhofer Portugal

2.1
Overview of Fraunhofer Portugal

Founded in 2008 by the Fraunhofer-Gesellschaft and the German-Portuguese Chamber of Commerce and Industry (CCILA) – within the framework of a long-term Portuguese-German collaboration to explore mutual interests in science and technology – Fraunhofer Portugal has the mission to undertake applied research of direct utility to private and public enterprises and of wide benefit to society.

Fraunhofer Portugal currently materialises itself through its two centres: the Fraunhofer Portugal Research Centre for Assistive Information and Communication Solutions (FhP-AICOS), located in Porto and Lisbon, founded in 2009 following a partnership between the Fraunhofer-Gesellschaft, the Foundation for Science and Technology (FCT) and the University of Porto (UP), and the Fraunhofer Centre for Advanced Water, Energy and Resource Management (FhP-AWAM), founded in 2019 in partnership between Fraunhofer-Gesellschaft, Fraunhofer Portugal, the Foundation for Science and Technology (FCT), the University of Trás-os-Montes e Alto Douro (UTAD) and the University of Évora (UÉ), located in Vila Real and Évora.

Fig. 01 Fraunhofer Portugal Institutional Background

2.1.1
Vision – A Driving Force in Innovation

Fraunhofer Portugal proposes a radical change regarding technological innovation in collaboration with scientific institutions in Portugal and aims at creating scientific knowledge capable of generating added value for its clients and partners, exploring technology innovations oriented towards economic growth, social well-being, and the improvement of the quality of life of its end-users.

2.1.2
Mission – Research of Practical Utility

Fraunhofer Portugal promotes applied research of direct utility to private and public institutions and of broad benefit to society, by managing and coordinating the cooperation of its research centres with:

- ***Other Research Institutions*** – such as universities and other relevant Portuguese or non-Portuguese research institutions, as well as Fraunhofer Institutes and other research centres integrated in the Fraunhofer-Gesellschaft knowledge network;
- ***Industry Partners*** – clearly perceived and understood as our main customer group, we are developing partnerships and cooperation agreements with private and public enterprises, as well as participating in business associations;
- ***Supporting Partners*** – Government Institutions and other Institutional partners.

2.1.3 Funding Model

Fraunhofer-Gesellschaft and the Portuguese Foundation for Science and Technology (FCT) agreed on a tripartite funding model similar to the one used by Fraunhofer-Gesellschaft.

At Fraunhofer Portugal, our scientists and engineers work with a budget financed by external revenue (projects and licensing) and institutional funding provided by FCT and Fraunhofer-Gesellschaft.

External revenue should be guaranteed through research projects, development projects, contracts signed with third parties within Fraunhofer Portugal's fields of activity, intellectual property rights and licensing of the commercial optimization of products and services resulting from Fraunhofer Portugal's Research and Development (R&D) results.

2.1.3.1 Fraunhofer-Gesellschaft

Research of practical utility lies at the heart of all activities pursued by the Fraunhofer-Gesellschaft. Founded in 1949, the research organisation undertakes applied research that drives economic development and serves the wider benefit of society. Its services are solicited by customers and contractual partners in industry, the service sector and public administration.

At present, the Fraunhofer-Gesellschaft maintains 76 institutes and research units. The majority of the more than 32,000 staff are qualified scientists and engineers, who work with an annual research budget of 3.4 billion euros. Of this sum, 3.0 billion euros is generated through contract research. Around 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. Around 30 percent is contributed by the German federal and state governments in the form of base funding, enabling the institutes to work ahead on solutions to problems that will not become acutely relevant to industry and society until five or ten years from now.

International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development.

With its clearly defined mission of application-oriented research and its focus on key technologies of relevance to the future, the Fraunhofer-Gesellschaft plays a prominent role in the German and European innovation process. Applied research has a knock-on effect that extends beyond the direct benefits perceived by the customer: Through their research and development work, the Fraunhofer Institutes help to reinforce the competitive strength of the economy in their local region, and throughout Germany and Europe. They do so by promoting innovation, strengthening the technological

base, improving the acceptance of new technologies, and helping to train the urgently needed future generation of scientists and engineers.

As an employer, the Fraunhofer-Gesellschaft offers its staff the opportunity to develop the professional and personal skills that will allow them to take up positions of responsibility within their institute, at universities, in industry and in society. Students who choose to work on projects at the Fraunhofer Institutes have excellent prospects of starting and developing a career in industry by virtue of the practical training and experience they have acquired.

The Fraunhofer-Gesellschaft is a recognized non-profit organisation that takes its name from Joseph von Fraunhofer (1787–1826), the illustrious Munich researcher, inventor and entrepreneur.

2.1.3.2 German-Portuguese Chamber for Industry and Commerce (CCILA)

With over 1.000 associates in Portugal and Germany, the objective of the Chamber is to enhance and promote the economic relationships between the two countries.

2.1.4 Business Model

Fraunhofer institutes and centres operate independently as 'profit-centres' within the research market under the umbrella of their respective national independent legal entity. Each institute is responsible for its respective budget and correspondingly needs to successfully transfer its competencies to the market. Generally, the financing of Fraunhofer institutes comprises three core elements:

1. Institutional funding from governmental sources (in Portugal provided by FCT and Fraunhofer-Gesellschaft) to conduct pre-competitive research in selected strategic fields;
2. Project funding from public sources linked to specific projects within the context of public programs from the EU or national governments. These grants are acquired in competition with other research facilities and industry;
3. Industrial revenues from contract research commissioned by industry.

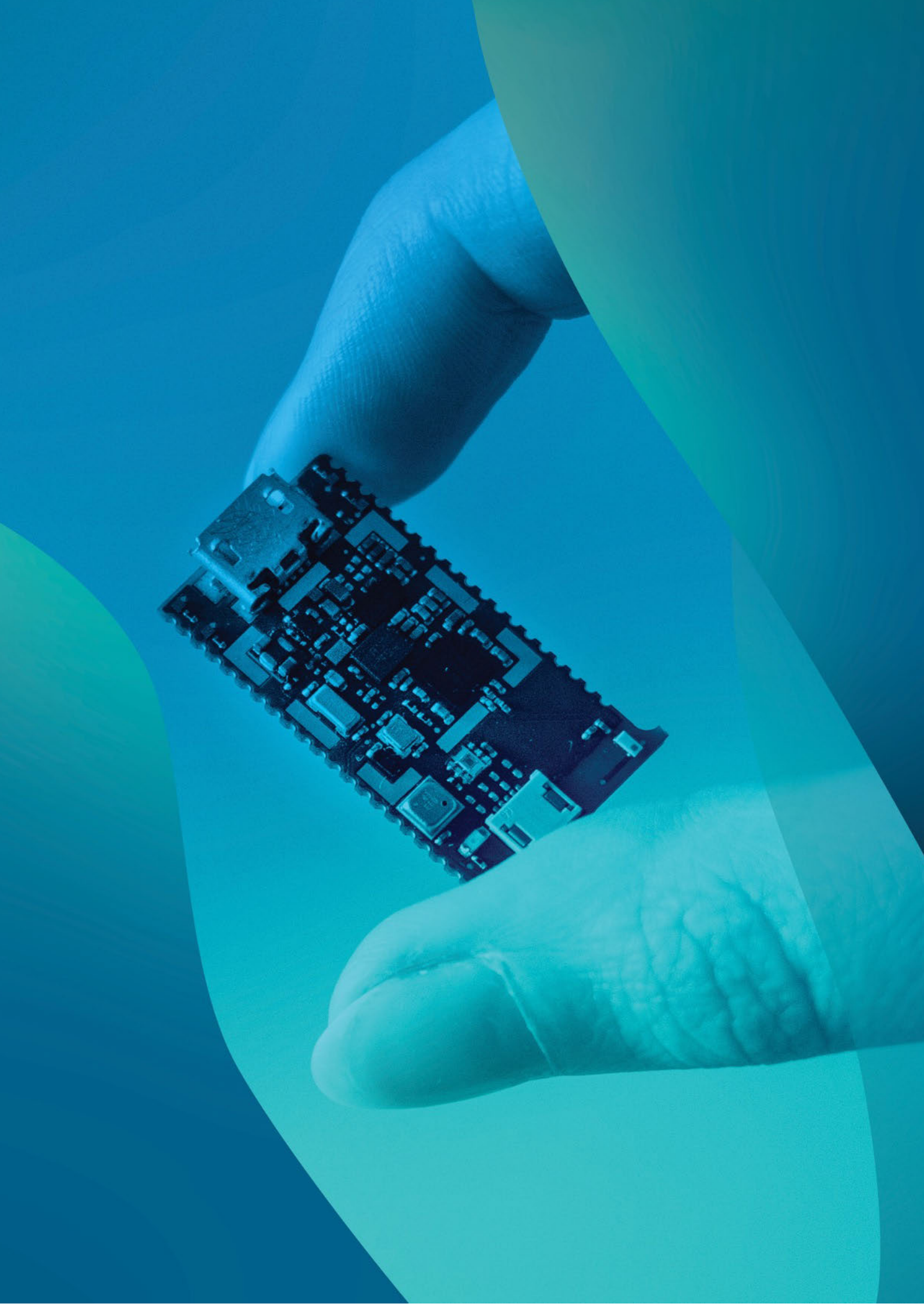
The Fraunhofer model is characterised by the high level of independence that its associated institutes enjoy. Institutes put a strong emphasis on research and market-oriented approach. This is combined with networking activities within Fraunhofer, as well as the integration of external national and international actors.

The Fraunhofer model also aims for well-established and distributed shares of funding. Around 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and publicly financed research projects. Around 30 percent is contributed by the German federal and state governments in the form of base funding, enabling the institutes to work ahead on solutions to problems that will not become acutely relevant to industry and society until five or ten years from now.

International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the highest importance to present and future scientific progress and economic development.

Fraunhofer Portugal

Legally independent affiliate Fraunhofer entities operating research centres, besides Portugal, have been founded in the United States, Austria, Italy, Sweden, Chile, United Kingdom, and Singapore to cooperate with leading local academic and research partners. While operating under the same principles as German Fraunhofer Institutes, these centres at the same time adapt to local environments and research markets.



3
Governance & Management

3.1
Governance Structure

Fig. 02 Governance Structure diagram

Fraunhofer Portugal seeks to follow the best practices in every area of the Association's governance by reflecting such practices in its statutes and principles and the subsequent transparency of its internal organisation. The associative structure of Fraunhofer Portugal clearly distributes functions, duties, and responsibilities among its governing boards.

3.2
Management

Fraunhofer Portugal's management is a shared responsibility of both the Executive Board (responsible for daily management and current management actions) and the Supervisory Board (with broad assessment powers).

3.2.1
Supervisory Board

President
Jörg Laschke
Director for Finances,
Controlling and Organisation
Fraunhofer-Gesellschaft

Vice-President **João Paulo Oliveira** CEO Triangle's	Member **Alexander Michaelis** Institute Director Fraunhofer IKTS
Member **Paulo Simões** Chief Financial Officer Worten Portugal	Member **Maria Isolina Mesquita** Vice-President Bluepharma Group

3.2.2
Executive Board

President **Pedro Almeida 1** FhP Corporate Representation and Finance Director	With a professional career that started with R&D activities through to the full innovation cycle with the creation of a spin-off of a prestigious University in Portugal, Pedro Almeida holds a M.Sc. in Electronics and Telecommunications Engineering by the University of Aveiro and holds a post-graduation in Advanced Management for Executives also from the same university.
Member **Stefanie Götz 2** FhP Administrative Director	With a legal career in corporate-related fields of Law and experience in technology transfer and intellectual property, Stefanie Götz holds a degree in Law, a post-graduation in Labour Law and an executive master in Management from the Universidade Católica Portuguesa, Porto. Stefanie is currently an MBA student at Católica Porto Business School.
Member **Liliana Ferreira 3** FhP-AICOS' Director	With an academic and professional career focused on research in the areas of Health Informatics, Human Language Technologies and Artificial Intelligence, Liliana Ferreira holds a Ph.D. in Informatics Engineering and a M.Sc. in Electronics and Telecommunication Engineering, by the University of Aveiro, complemented with a strong research background developed in several industry and R&D organisations across Europe (Portugal, Germany and the Netherlands).
Member **Ulrich Meissen 4** FhP-AICOS's FhG Advisor	With a research career and extensive experience in information logistics and warning systems, Ulrich Meissen holds a master's degree in industrial engineering and a Ph.D. on Targeted Alerting in Early Warning Systems. Since the beginning of his career at Fraunhofer, he implemented several early warning systems at a local and global level. Ulrich Meissen is currently heading the Business unit "ESPRI – Electronics Safety and Security Systems for the Public and Industries" at Fraunhofer FOKUS.
Member **Thomas Härtling 5** FhP-AWAM's FhG Advisor	With a career focused on exploring nanoscale materials for measurement technologies applied to biotechnology, environmental technology and agriculture, Thomas Härtling holds a Diploma and Ph.D. in physics from the Technische Universität Dresden, Germany, where he built a solid experience in sensors technology based on nanomaterials. Thomas Härtling is Group Leader of Optical Testing and Nanosensors at Fraunhofer IKTS.

4
Research by Fraunhofer Portugal

Fraunhofer Portugal currently materializes through its two research centres – FhP-AICOS and FhP-AWAM – which embody the vision and mission that is incorporated in all initiatives driven by Fraunhofer Portugal, i.e., being a driving force in Innovation and doing research of practical utility.

In this section you will find how FhP-AICOS and FhP-AWAM are successfully implementing this mission.

4.1
FhP-AICOS

Fig. 03 FhP-AICOS Scientific Competences

Fraunhofer Portugal Assistive Information and Communication Solutions (AICOS) is a leading European applied research organization. AICOS pursues the vision of futures where the impact of technology sustainably enhances living and working standards through applied research of direct utility and wide benefit to society.

Founded in 2009 as a result of the partnership between Fraunhofer-Gesellschaft (FhG), the Foundation for Science and Technology (FCT), and the University of Porto, AICOS is the pioneering research centre of Fraunhofer Portugal. AICOS holds a track record in national and international projects, partnerships, and consortiums in its fields of competencies and expertise: Human-Centred Design, Artificial Intelligence and Cyber-Physical Systems.

As a result of its reputable R&D, since 2009, AICOS has been involved in 20 European projects and established partnerships with over 400 organizations in 30-plus countries. Learning and advancing knowledge for the benefit of society at large is a core value upheld in all projects and future visions. Through a unique approach to People-Intelligence-Things, the AICOS team of over 100 researchers commits daily to anticipating, envisioning, and actively exploring and shaping the potential future outcomes (Digital Futures) and impacts of digital technologies in the domains of Health (Digital Health) and Industry (Digital Industry).

With renown evidence in research through design – technology created by people, with people, and for people, AI-based solutions resorting in computer vision, time-series, and natural language processing, and reliable, scalable, and resource-efficient cyber-physical systems, AICOS proposes bold, innovative solutions with an acute awareness of current and future regulatory and ethical developments and challenges for healthcare and industry.

Embodying the core-values of excellent R&D for the wide benefit of society, FhP-AICOS is committed to assuring that the Future is co-designed and technologically sustainable to enhance lives.

4.2
Highlights

2024 marks the approval of two high-volume, strategic European projects. The ACHILLES project is an ambitious initiative funded by the European Union, designed to reshape the field of artificial intelligence (AI) by enhancing its efficiency, transparency, and trustworthiness. Coordinated by Fraunhofer Portugal AICOS, ACHILLES brings together 16 organizations from across Europe to address the critical challenges AI faces today. The project focuses on developing lighter AI models that consume less energy and data while maintaining optimal performance. It also emphasizes making AI systems more transparent by improving their explainability and ensuring they meet stringent ethical standards. By improving the reliability and robustness of AI, ACHILLES is committed to creating systems that comply with legal requirements and are applied in real-world sectors such as healthcare, pharmaceuticals, and identity verification. The project aims to shape a more sustainable and ethical AI future, aligning technological advancements with European values.

In parallel, the SmILE project is set to revolutionize healthcare for the aging population, particularly for those suffering from musculoskeletal (MSK) diseases. As MSK conditions become more prevalent among the elderly, implantable electronics present a promising solution for monitoring health parameters in real-time. The SmILE project focuses on developing an implant-embedded electronic chip system capable of recording crucial data such as temperature, pH, and strain, using a standardized connection compatible

with various sensors. Fraunhofer Portugal AICOS plays a vital role in developing low-energy consumption, biocompatible, and secure data transmission solutions to ensure continuous, autonomous measurements within the human body. Furthermore, the AI algorithms integrated into SmILE will provide personalized health advice based on real-time data from the implants. By combining this data with other health and lifestyle information, SmILE will offer insights into disease progression, implant deterioration, and potential health complications.

The SmILE project is led by Fraunhofer IMTE, bringing together a consortium of 22 partners across Europe.

Those initiatives, fully aligned with the Digital Health and Digital Future business areas of AICOS, focus on leveraging cutting-edge technologies like AI, resource efficient cyber-physical systems, and real-time data monitoring to enhance healthcare outcomes, improve patient empowerment, and contribute to the development of sustainable, data-driven solutions.

4.2.1
Events

FhP-AICOS' dedication to research and technological progress is reflected in a wide range of activities, from hosting internal events to actively participating in external conferences and seminars. Additionally, our commitment to academic excellence is evident in our involvement in academia-focused events, bridging the gap between research and real-world applications. This section highlights our dynamic engagement in these events, reinforcing our role as a bridge for scientific and technological advancement.

Internal (self organized)

AI Ideation Workshop

We hosted an AI Ideation Workshop, bringing together 23 participants from various companies. The event, led by experts from the Intelligent Systems group, aimed to explore the transformative potential of Artificial Intelligence in industry. It featured engaging discussions, hands-on sessions, and debates on AI's future implications, emphasizing collaborative ideation for innovative AI solutions to enhance efficiency, sustainability, and growth.

Master Students Workshop

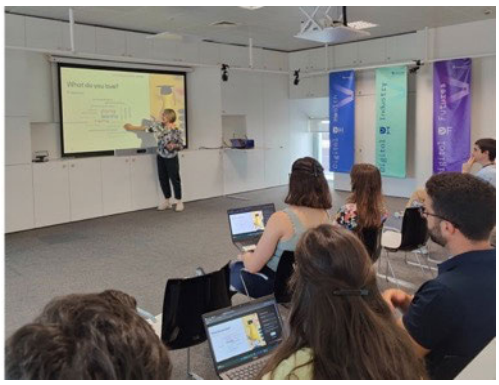
We welcomed the 2024 master's students - who were embarking on a new adventure – with a Workshop intended to prepare the students for a year of challenge, growth, and remarkable achievements.

In total, 19 students participated in this workshop, distributed across the Porto and Lisbon offices and online participation.

Workshop “Privacy in AI”

“Privacy in AI” was the theme of the workshop organised by the Center for Responsible AI, and held at the premises of FhP-AICOS, in Porto. Professionals and experts gathered to debate one of the most current topics related to technology and innovation.

This workshop sought to bridge this gap, offering a practical and theoretical exploration of privacy in AI, underscored by real-world applications and some legal insights.



Workshop "Developing People – Doing Less to Achieve More"

In July we hosted an engaging workshop led by Prof. Geraldine Fitzpatrick on "Developing People – Doing Less to Achieve More." The event took place at our FhP-AICOS offices in Porto, focusing on innovative supervision and leadership approaches. Participants explored how to leverage questions, utilize collective expertise, and foster team growth.

This initiative underscores our commitment to investing in our employees' development, ensuring they have the tools to excel in their roles.

Fraunhofer Portugal Challenge

The 15th edition of the Fraunhofer Portugal Challenge has recognized the most groundbreaking technological ideas of 2024! From smart implants for bone healing to AI-powered quality control, this year's winners are shaping the future. The closing event took place in September, at the Faculty of Engineering of the University of Porto.

The idea contest, organized by Fraunhofer Portugal AICOS, seeks to bridge the gap between academic research and industry by awarding research projects with practical applicability and societal impact.

The Challenge has continually expanded its scope, most recently adding the Student Award category in 2023 to encourage early-stage Master's students to submit their innovative ideas. In addition to monetary prizes, the winners also benefit from mentoring provided by Fraunhofer Portugal AICOS researchers, fostering future collaborations and innovation-driven entrepreneurship.

Winning Ideas (MSc Thesis Category)

- Diogo Pires (1st Prize) | University of Aveiro | "Development of an instrumented implant comprising capacitive technology to monitor the fracture bone healing";
- Diogo Martins (2nd Prize) | University of Minho | "Deep Learning-based Posture Recognition for a Holistic Ergonomic Assessment Framework";
- Miguel Peixoto (3rd Prize) | University of Minho | "Anomaly Detection as a Quality Control Tool in an Industrial Context".

Student Award Category

- Martim Silva | University Católica Portuguesa | ReHeAIrt: AI-Driven ECG Application for Enhanced Post-Surgery Recovery Evaluation.

FhP-AICOS 15th Anniversary

In September, we opened our doors to celebrate our 15th anniversary with a full week of events. From engaging students to showcasing cutting-edge solutions to industry leaders, partners, and stakeholders, to capturing the excitement of Challenge 2024, it was a week filled with inspiration, collaboration, and future-driven ideas.

HCD Week @ AICOS

From November 25th to 29th, we have hosted a full week dedicated to Human-Centred Design, with a series of free, public events, including workshops, training sessions, and presentations, where we dived into how human-centred design can make technology smarter, safer, and more inclusive.

Under the theme "Design Research in the Making," this annual event, organized by Fraunhofer Portugal AICOS, welcomes everyone—from the scientific, academic, and industrial communities to the general public.

External (third party organization)

Talk at Tagus Park

Understanding the "why" and "how" behind algorithms is not just a matter of curiosity...it's essential for ensuring they serve us responsibly, ethically, and legally. On February 8th, at IST TagusPark, FhP-AICOS Senior Researcher, Duarte Folgado, led a talk into the fascinating world of Explainable Artificial Intelligence (XAI), unraveling the mysteries of AI's decision-making processes, especially in the critical field of healthcare.

"AI in Health" session

Senior Researcher, Maria Vasconcelos, led a session on the 12th of March, addressing "AI in Health". The talk took place within the "Digital Health: Key Knowledge in Digital Health Immersion" course.

This 2-day course, promoted by Ahed - Advanced Health Education, aims to empower healthcare professionals as architects of the next generation health journey.

"Para além da Engenharia" Workshops

The 4th edition of "Para Além da Engenharia" took place from 4th to 7th March. On the 5th, Maria Vasconcelos, Senior Researcher at Fraunhofer Portugal AICOS, led a workshop on Medical Informatics.

"Para Além da Engenharia" is an event organised by the Engineering Physics (NEEF) and Mechanical Engineering (NEEMec) Student Groups of the Aveiro University Academic Association. It aims to create a training event in collaboration with companies.

INVICTA Spring School

On Day 5 of the INVICTA Spring School (Friday, 22 Mar), Ines Sousa, Head of Intelligent Systems at FhP-AICOS, led a special AI Talk providing exclusive insights into the groundbreaking AISym4MED project.

The INvicta school of VIsion, Computational intelligence, and patTern Analysis - INVICTA - is a school of artificial intelligence, computer vision and pattern analysis organised by the Visual Computing and Machine Intelligence - VCMI - group of the Centre for Telecommunications and Multimedia - CTM - of the INESC TEC.

CUMULUS 2024

Ana Correia de Barros, Head of Human-Centred Design, presented a paper at the prestigious Cumulus Conference, which took place in Budapest from the 15th to the 17th of May. Ana shared insights from our research with the paper titled "Generating design briefs based on the analysis of workplace artifacts invented by industrial workers: Towards addressing gaps of context and scope in the study of spontaneous design." This presentation delved into how spontaneous design by industrial workers can inform and inspire more effective design briefs, enhancing our understanding and methodologies in human-centred design.

AISYM4MED Symposium on AI in Clinical Practice

As a specialist in Medical Time Series, our Senior Researcher, Marília Barandas, led a keynote lecture at the AISYM4MED Symposium on AI in Clinical Practice.
The session took place on the 21st of June, at Boothzaal, Utrecht.

AISym4Med is the platform that will change and improve the healthcare data system. It aims at developing a platform that will provide healthcare data engineers, practitioners, and researchers access to a trustworthy dataset system augmented with controlled data synthesis for experimentation and modeling purposes.

Semana da Inovação e Ciência

Together with representatives of the Portuguese industrial sector, the director of Fraunhofer Portugal AICOS, Liliana Ferreira, participated in June in a debate on the scientific and technological system. In addition to the director of FhP-AICOS, Braz Costa (Director General of CITEVE), Pedro Oliveira (Administrator of LEICA), and Jorge Laranjeira (Innovation Manager, MoldIT Industries) also participated in the round table on the theme "Dialogue between Company Representatives and Representatives of the Scientific and Technological System."

This session took place as part of the "Semana da Inovação e Ciência" an initiative organised by Famalicão City Council in partnership with COTEC, ANI - Agência Nacional de Inovação and CCDR-Norte.

Café de Ciência no Parlamento

Fraunhofer Portugal AICOS was proud to be part of the critical discussion on Responsible Artificial Intelligence at the *Café de Ciência at the Portuguese Parliament*, which took place on October 9th.

Inês Sousa, Head of the Intelligent Systems Group at Fraunhofer Portugal AICOS, joined the debate in discussing such topics as: How should policymakers shape AI regulation in Portugal? What are the responsibilities and rights of those developing and using AI? How does the EU Artificial Intelligence Act, in effect since August, influence national strategies?

The debate brought together politicians, scientists, and experts to explore the ethical, social, and economic impacts of AI, focusing on the Responsible AI framework.

Mutual Learning Workshop - European project FUTURESILIENCE

Our Head of Human-Centred Design, Ana Correia de Barros, participated in the Mutual Learning Workshop as part of the European project FUTURESILIENCE.

The workshop took place at the University of Ferrara, Italy, bringing together representatives from all project "Labs", including our Lab Fictions. Together, they discussed the challenges each country is facing and explored strategies to overcome them.

DIGICOM 2024

Researcher Isabella Silva presented the paper "Digitalisation of Maintenance Work in Cleanrooms: User Research Insights for Interaction Design" at the DIGICOM 2024 in Barcelos.

This research focused on designing a digital tool tailored for maintenance workers operating in extreme environments like cleanrooms. The findings reveal core features for improved interaction design and highlight key challenges for designers in these unique settings.

4.2.2
Awards

In 2024, FhP-AICOS has once again been recognized for its excellence, with our researchers and projects earning prestigious awards. These prizes highlight our ongoing commitment to innovation and our leadership in research and technological advancement. They serve as both a testament to our impact and a motivation to continue pushing the boundaries of possibility. This section celebrates the awards received by our team, showcasing the significance of our work on a global scale.

Honourable Mention - ANATHEMA

ANATHEMA won an honourable mention at the 2nd Oncosexology Congress, organised by IPO do Porto. The poster entitled "Promoting sexual health among colorectal cancer survivors: Randomised controlled trial (Anathema)" was selected as one of the six best posters presented at the Congress.

Best Paper Award at the CHI 2024 conference

From our Human-Centred Design team, Francisco Nunes, along with Leonor Portugal and Paula Silva from Centre for Informatics and Systems of the University of Coimbra (CISUC), have received a "Best Paper" award at the prestigious CHI 2024 conference. "Understanding Feedback in Rhythmic Gymnastics Training: An Ethnographic-Informed Study of a Competition Class" showcases the critical importance of studying users in-context to effectively understand and design digital interactive technologies that support and provide feedback in Rhythmic Gymnastics training.

Best Poster Award at the International Conference on Distributed Computing in Smart Systems and the Internet of Things

Waldir Júnior, Innovation Lead for Digital Farming & Senior Scientist in the Connected Things group, presented at the International Conference on Distributed Computing in Smart Systems and the Internet of Things the Lite4More's innovative BLE-based platform for smart lighting automation. It was awarded Best poster.

Best Poster Award at the 9th International Conference on Internet of Things, Big Data and Security the work

João Gomes, Researcher at FhP-AICOS, presented at the 9th International Conference on Internet of Things, Big Data and Security the work on Lite4More, a modular solution automating smart lighting commissioning, reducing costs, and boosting user well-being.

The work was distinguished with Best Poster Award. It has been developed by FhP-AICOS' team (involving our three groups: Human-Centred Design, Intelligent Systems and Connected Things).

FLAD Science Award Mental Health

A project to support people at risk of psychosis, led by researchers from Fraunhofer Portugal AICOS, has won the FLAD Science Award Mental Health.

PRODROMUS is the name of the awarded technology which was thought to ensure FhP-AICOS' team develops an evidence-based solution that caters to the needs and is adopted by UHR/CHR/FEP populations.

"PRODROMUS has the potential to impact science, clinical practice, and society, as well as the lives of UHR/CHR/FEP populations worldwide. The project uses digital technology and innovative scientific data collection, trialing, and analysis techniques to address major clinical and socio-technical challenges related to the accurate assessment of psychotic conditions, the development of DP-JITAIs targeting UHR/CHR/FEP individuals, and the successful implementation of such interventions in real-contexts." The words are from Cristina Mendes Santos, Senior Researcher at FhP-AICOS, and Project Manager of the award winning PRODROMUS - A digital phenotyping enhanced just-in-time adaptive intervention for preventing people at ultra-high risk, clinical high risk, or with first-episode psychosis from transitioning to psychosis.

The award ceremony took place in July 2024 and was attended by the Minister of Education, Science and Innovation, Fernando Alexandre, the Portuguese Secretary of State for Health, Ana Povo, and the President of FLAD, Rita Faden.

Best Poster Honorable Mention

FhP-AICOS has been awarded Best Poster Honorable Mention at the ACM CUI 2024 conference in Luxembourg.

Leina Meoli, from the University of Cape Town, presented the paper "A Not So Chatty 'Chatbot': Co-designing to support First-Time Parents in South Africa and Portugal," part of our ParentCoach project.

Coordinated by FhP-AICOS, ParentCoach consists of an interactive chatbot that provides accurate - easy-to-understand - information, giving the necessary support in postnatal healthcare. The goal is to avoid bigger health problems or complications in the future.

DNA Paris Design Awards 2024

Two of FhP-AICOS' design solutions were amongst the winners of the DNA Paris Design Awards 2024. The Operator and Redefine were the two winning projects in the Product Design/Design for People category.

Additionally, our HomeSenseALS mobile app, designed for those with Amyotrophic Lateral Sclerosis, received an Honorable Mention in the Graphic Design/UI Design category.

FhP-AICOS' digital solution is a finalist in the Longitude Prize on Dementia

AUTONOMOUS is a digital solution developed by a team of researchers at Fraunhofer Portugal AICOS (FhP-AICOS), in collaboration with Carnegie Mellon University (CMU) and the LUCA School of Arts. Its goal is to assist individuals with dementia safely and independently performing daily tasks. This solution is one of five innovative technologies selected as a finalist in the Longitude Prize on Dementia, competing for a final prize of approximately €1.2 million.

"By leveraging artificial intelligence, the application adapts to individual routines, offering real-time assistance without compromising privacy. This balance between

autonomy and safety has the potential to not only improve the quality of life for people with dementia but also provide peace of mind to caregivers, who can trust that their loved ones are living more securely and independently," explains Cristina Santos, Senior Researcher at FhP-AICOS and part of the AUTONOMOUS team.

As one of the five finalists, the project received a grant to further develop the technology. Initially, 24 semifinalists were announced in 2023, with five finalists revealed in October 2024. The winner of the Longitude Prize will be announced in 2026 and will receive a final award of €1.2 million.

Best Universidade de Lisboa Master Thesis Award at the RedeSAÚDE

On the 22nd of November 2024, the thesis "Development of an evidence-based toolkit for self-care in gestational diabetes using a mobile application" received the Best Universidade de Lisboa Master Thesis Award at the RedeSAÚDE Conference in the topic of health systems, entrepreneurship, and digital transition.

The thesis – developed by the FhP-AICOS researcher Lua Neves - was about developing a digital user-centred, evidence-based Toolkit for supporting self-care in GDM to be integrated into a mobile app. It required conducting user-research activities to understand the experiences and perspectives of women with GDM and dietitians regarding GDM management through interviews and co-creation sessions, as well as tailoring the Toolkit's content to women's distinct characteristics and validating the Toolkit by assessing healthcare professionals' agreement with its content through an online survey.

4.3 FhP-AWAM

Fig. 04 FhP-AWAM Business Areas

The Fraunhofer Portugal Center for Advanced Water, Energy and Resource Management (FhP-AWAM), with branches in Évora and Vila Real, was created in 2019 resulting from a partnership between Fraunhofer-Gesellschaft, the Foundation for Science and Technology (FCT), Fraunhofer Portugal, Universidade de Trás-os-Montes e Alto Douro (UTAD) and Universidade de Évora (UÉ).

FhP-AWAM develops technological solutions for a wide range of sectors such as agriculture, food and beverages production, waste and water treatment, pulp and paper, (bio)energy and (bio)chemical industries.

FhP-AWAM conducts applied research and development with a clear customer focus to provide cutting-edge solutions for a sustainable circular economy in the following innovation areas:

- Water;
- Energy;
- Resource Valorization.

FhP-AWAM proposes new solutions and ideas for evolving products and services, considering the research competences from initial proof of concepts up to full pilot plant implementations.

4.4 Highlights

With the completion of the INICIO infrastructure project, which facilitated the acquisition of equipment and the refurbishment of laboratory and office spaces in Vila Real, 2024 marked the official start of laboratory work. The scientists successfully resumed project tasks that had been stalled due to the construction delays.

The new lab facilities enable FhP-AWAM to generate industry revenues while growing its R&D competences through publicly funded projects. The center is now consolidating its operation, focusing on increasing project acquisition. With this in mind, several visits to relevant stakeholders were pursued to streamline partnerships/industry revenues by purposefully seeking to know and understand industries' issues. Furthermore, the team increasingly participated in external events, disseminating project results and engaging with academic and industry partners.

The year was also marked by a leadership transition at the center, with Marisa Rio appointed as the new Director in May.

FhP-AWAM's 5-year celebration

Last year was a significant milestone for AWAM, as it celebrated its 5th anniversary. This occasion was marked by a gathering of valued academic and industry partners, funding associates, and local entities.

The opening session was led by the Mayor of Vila Real, Dr. Rui Santos, and also featured the participation of the President of the Northern Regional Coordination and Development Commission (CCDR-N), Professor António Cunha, and the President of Régia Douro Park—Science and Technology Park, Dr. Nuno Augusto.

FhP-AWAM's strategic partners were also involved in the discussions, including the Rector of the University of Trás-os-Montes and Alto Douro (UTAD), Professor Dr. Emídio Gomes, the Rector of the University of Évora, Professor Dr. Hermínia Vasconcelos, and the Director of the Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Professor Dr. Alexander Michaelis.

Additionally, the event was attended by the President of the Board of Directors of the Foundation for Science and Technology, Professor Madalena Alves, various representatives of entities from the National Scientific and Technological System, and representatives of companies with which the center has already established collaborations.

During the event, AWAM's scientists engaged with guests and showcased their work on several major research projects.

5th METHAREN Consortium Meeting

FhP-AWAM received the 5th consortium meeting of METHAREN project. METHAREN is a Horizon Europe project that aims to demonstrate a cost-effective, innovative, sustainable and circular biomethane production system enabling renewable energy sources intermittency management to significantly enhance biomethane production. The meeting was held in November at FhP-AICOS in Porto.

Winter School of Contaminants of Emerging Concern and Disinfection By-Products

Fraunhofer Portugal AWAM participated in the Winter School with a stand, showcasing the technologies and work developed at the center. This event was followed by the Ozone and Advanced Oxidation EA3G2024 International Conference and Exhibition. In these events the colleagues Giovanna Calvão, Vanessa Mendes and Bruno Esteves had the opportunity to share their results on the treatment and monitoring of winery wastewaters.

19th Expo Water Conference

Pedro Cardoso represented FhP-AWAM at the 19th Expo Water Conference in the discussion panel "Digitalization and Innovation in the Water Sector: Opportunities?".

The panel discussed three key points: What opportunities exist to increase digitalization and innovation in the global and integral management of the water sector (water resources and water supply)?; What priority projects should be developed, and what major projects are underway in this area that could point the way forward?; and finally, What financial support can the sector attract to realize this potential?

Participation in the Regia Douro Summit

FhP-AWAM welcomed participants of the *Regia Douro Park Summit: entrepreneurship, ecoinnovation and sustainability* an event designed primarily for Environmental Engineering students from UTAD. During their visit, participants toured FhP-AWAM's laboratories and had the opportunity to learn directly from the scientists about their impactful projects that connect academia with industry and how their work contributes to a more sustainable future.

Participation in the Ecotech Challenge

Ana Catarina Faria challenged UTAD students to develop ideas for optimizing CO2 capture during the wine fermentation process at a Hackathon. This event, organized by UTAD, also provided an opportunity to introduce FhP-AWAM and discuss practical research topics with students in the Engineering and Sciences programs.

The students who win the first prize will be invited to participate in the ChangeLab, a Training and Idea Validation Program designed to promote entrepreneurship within the academic community at UTAD.

5
Impact Assessment of Research Excellence

The diverse achievements of 2024 highlight Fraunhofer Portugal's research excellence. These include securing European, national, and industry-funded projects, contributing to and organizing scientific conferences and events, participating in third-party events, and receiving prestigious awards that recognize the quality of its research centres' work.

Industry direct contract projects demonstrate Fraunhofer Portugal's commitment to fostering strong, long-term collaborations with key clients, while European and national projects highlight the significant impact of its research centres. These projects span various domains and current societal challenges, from advancing more trustworthy and compliant AI applications to enhancing post-surgery patient management, strengthening auditing and governance for machine learning in public services, and predicting disease activity in rheumatic and musculoskeletal diseases.

To promote Fraunhofer Portugal’s vision, mission, and global presence, its research centers actively contributed to leading conferences and scientific journals, organized different public events, and engaged in various third-party events and meetings.

Finally, 2024 brought different awards, which highlight the impact of the work carried out by Fraunhofer Portugal’s research centres.

5.1
Scientific Production

The scientific excellence of Fraunhofer Portugal's research centres, FhP-AICOS and FhP-AWAM, is reflected in the following key indicators.

In terms of new projects in 2024, FhP-AICOS has acquired two European projects, four national projects, and six industry direct contract projects. Among the EU projects, ACHILLES is coordinated by FhP-AICOS and underpins the AI Governance and Compliance Innovation Path within the Digital Futures business area. It complements the AICeBlock venture with a multidisciplinary perspective to align the legal, ethical, and technical dimensions towards more trustworthy and compliant AI applications.

Three of the national projects are funded by FCT through the Recovery and Resilience Plan (PRR) and are related to the call for artificial intelligence, data science, and cybersecurity solutions relevant to public administration. In a nutshell, these projects aim to enhance healthcare and public service systems through AI-driven solutions. They focus, respectively, on improving post-surgery patient management, ensuring robust auditing and governance for machine learning in public services, and predicting disease activity in rheumatic and musculoskeletal conditions using multimodal data.

The industry direct contract projects are either continuation of or new collaborations with current clients. Securing these projects showcases Fraunhofer Portugal's excellence and its ongoing commitment to building strong, long-term collaborations with key clients.

As for FhP-AWAM, 2024 brought the first direct industry contract to the centre. This project relies on the center’s expertise on biogas production to evaluate the biomethane production potential of volatile solids (BMP) of solid and liquid samples,

notably animal manure and leachate. The project also allows the centre to showcase its well-equipped lab facilities at the Vila Real location.

In 2024, Fraunhofer Portugal achieved a total of 58 publications, including conference and journal papers, abstracts, posters, demonstrations, book chapters, and datasets, showcasing its strong scientific output.

The scientific team continued its collaborative supervision of M.Sc. theses, guiding students across various topics aligned with Fraunhofer Portugal's research topics. In 2024, 36 theses were under supervision, 24 of which were successfully completed, achieving an average grade of 18 (out of 20).

The impact and excellence of the research carried out at Fraunhofer Portugal were well recognized through eleven awards: one poster honourable mention at the 2nd Oncosexology Congress (IPO-Porto); three best poster awards at the 20th IEEE International Conference on Distributed Computing in Smart Systems and the Internet of Things (IEEE DCOSS-IoT 2024), the 9th International Conference on Internet of Things, Big Data and Security Event Website (IoTBDS 2024), and the ACM Conversational User Interfaces conference (ACM CUI 2024); one best paper award at the ACM CHI conference on Human Factors in Computing Systems (CHI 2024); one best MSc thesis award at the 8.ª Conferência Anual da RedeSAÚDE; The FLAD Science Award Mental Health; two Winner and one honourable mention at the DNA Paris Design Awards; and the Longitude Prize on Dementia.

FhP Scientific Indicators

European Projects	2
Industry direct contract, National Projects	11
Journal Papers	19
Conference Papers	31
Other publications (Abstracts, Posters, Demonstrations, Book chapters, Datasets)	8
Awards	11
Concluded M.Sc. Theses	24

5.2 Job Creation and Capacity Building

The FhP-AICOS Senior Scientists Team grew to 22 members in 2024 (from 20 in 2023), resulting from investments in capacitating its collaborators who want to pursue a Ph.D. degree. It is worth noting that in 2024, FhP-AICOS had a total of 9 PhD students, including 6 AICOS collaborators and 3 students who come from the collaboration with the University of Porto through FCT doctorate scholarships in non-academic environments.

FhP-AICOS continued its collaboration with academia in 2024, with researchers lecturing at Portuguese Universities and participating in more than 30 qualifications and defences of MSc and PhD theses. Such collaboration not only helps build human capital but also further strengthens the ties with different research centres and universities.

In 2024, FhP-AICOS shared knowledge through tutorials, workshops, invited speeches, debates, and lectures. The audience included academia, industry, and government, and the topics covered those familiar to AICOS' work. Here are a few highlights of this knowledge-sharing effort: Tutorial at the 33rd International Conference on Artificial Neural Networks; Workshop on Design Research Methods for Sexuality and Intimacy at University of Minho; Invited speeches at the *II seminário Luso-Brasileiro de inovação e Envelhecimento Humano* and Future Health Conference; Debate at the Café de Ciência at the Portuguese Parliament; and different lectures for BSc and MSc at Cardiff University and University of Porto.

The FhP-AWAM Senior Scientists Team remained constant in 2024 at 7 people. Still, FhP-AWAM's researchers have continued expanding their network of contacts through direct visits to different potential partners from industry and academia, by attending several webinars and workshops, and by strengthening its ties to Portuguese universities. As a result, FhP-AWAM was invited by UTAD and UÉ to present talks at different events (e.g., PhD/MSc lectures and trade fairs).

The cooperation with AWAM's partners UTAD and UÉ was also strengthened through additional interactions and manifestations of interest for joint work, and especially through the integration of AWAM's senior researchers into the universities' research centres. All these activities are relevant to continue building a solid knowledge base for future capacity building. In addition, FhP-AWAM has continued to be invited to different consortia on submitted research proposals financed either at national or European level. On top of the existing running projects, these will potentially allow for further team growth, upon successful approval.

5.3
Public Engagement

In public engagement, we emphasize collaboration with R&D institutions, researcher participation in third-party events, project sessions with end users to showcase and validate our solutions, open sessions of the Thursdays with Science event, organization of different scientific events, and the 15th edition of the Fraunhofer Portugal Challenge. These initiatives play a key role in promoting Fraunhofer Portugal and its research centers on both national and international levels.

Regarding engagement with other R&D institutions, Fraunhofer Portugal hosted six researchers from institutions across Norway, Brazil, Mexico, France, and Germany, including the Norwegian University of Science and Technology, Instituto Federal de Brasília, Universidade Federal de Goiás, University of Sonora, University of Toulouse, and Universität Würzburg. These research stays reinforced Fraunhofer Portugal's collaborations with European and international institutions while promoting the exchange of knowledge and supporting the professional development of visiting scientists.

Our researchers actively contributed to various third-party events, leading workshops, talks, expert panels, and presentations. Notable engagements of FhP-AICOS researchers included the AISym4MED Horizon Europe Symposium on AI in Clinical Practice, the SECURED EU Project Workshop at Europe Point House in Budapest, and the CRAI Workshop at CPDPai 2024 in Brussels. FhP-AWAM organised the "Oportunidades e Desafios para um Setor Vitivinícola mais Sustentável" workshop within the scope of the Vine&Wine PT project, with about 40 participants and contributions from both industry and academia. Also, in the scope of the Vine & Wine PT project, the AWAM's team organized a workshop entitled "A reutilização da água

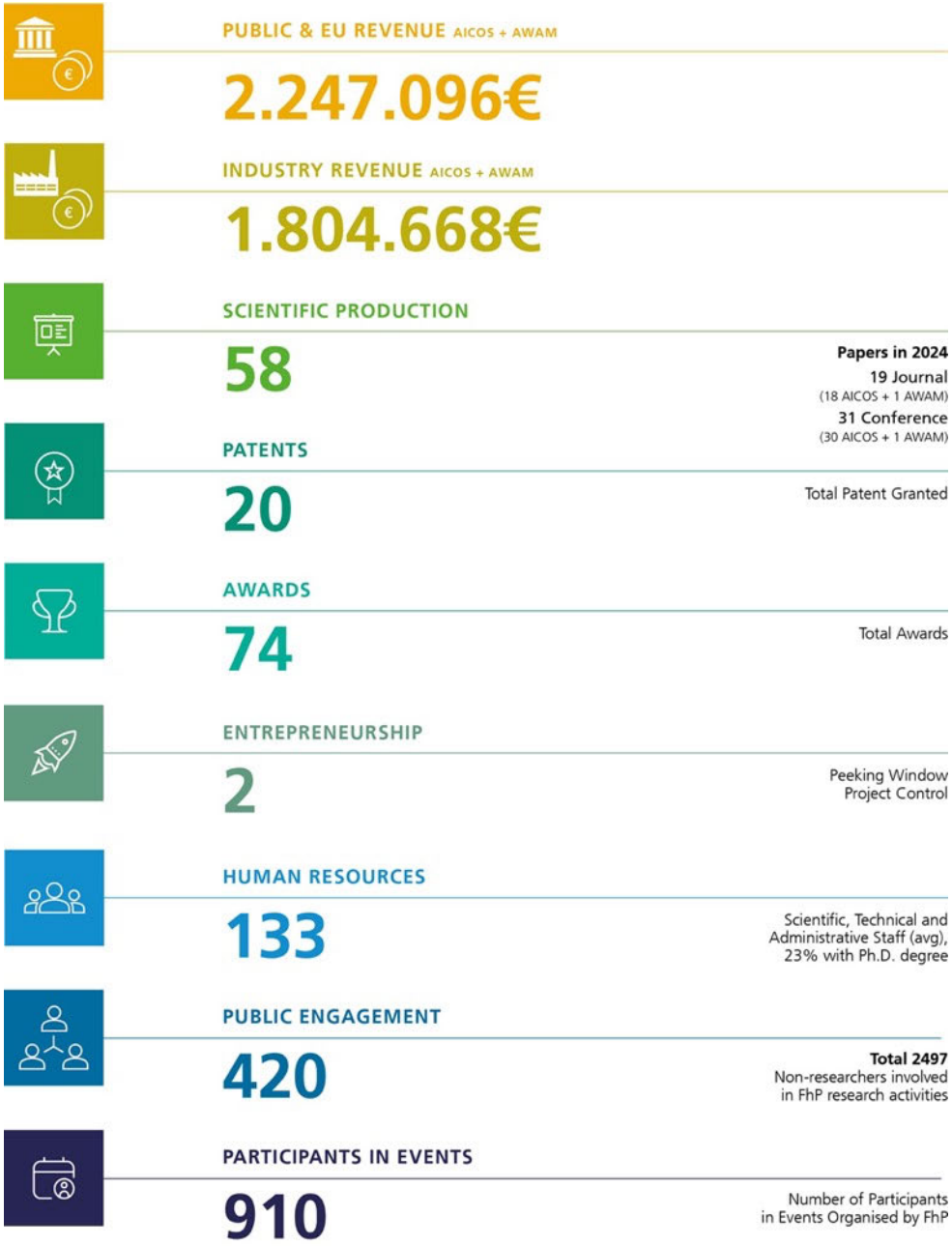
na Adega" within the Oenology and Viticulture B2B event Enotécnica with hundreds of participants. Moreover, FhP-AWAM was invited to be part of a round-table panel discussion on the 19. Expo Water Conference, discussing topics of digitalization and innovation in the water sector.

In 2024, Fraunhofer Portugal facilitated multiple sessions with end users, engaging a total of 420 non-researcher, non-technical participants. Projects such as Craft, Microeletrónica, Fictions, ATE, HfPT, AUTONOMOUS, iNNOVSensing, Signo, and AIsym4Med collaborated with these users to refine their solutions and validate outcomes.

Building on the success of earlier trials, Fraunhofer Portugal opened its Thursdays with Science (TwS) sessions to the public in 2024. Featuring speakers from diverse fields, the 21 sessions cater to the curiosity of researchers, students, professors, and industry professionals. Additionally, FhP-AICOS hosted and co-organized with Fraunhofer IAO the Open Identity Summit 2024, an event focused on cutting-edge innovations and practical applications in Identity Management, Trust Services, Open Source, End-to-End Encryption, and Cloud Computing. Other events organized by Fraunhofer Portugal include project Fictions workshops (to equip industrial workers with technology knowledge that can address skill gaps in the digital transformation of work), AISym4MED Horizon Europe Symposium on AI in clinical practice (co-organized with UMC Utrecht), the HCDWeek@AICOS (a series of talks, workshops, and keynotes dedicated to Design Research), and the AICOS week (different open days dedicated to the academia, industry, the Fraunhofer community, and alumni to celebrate AICOS' 15-year anniversary). These sessions and events welcomed over 910 participants.

Finally, the Fraunhofer Portugal Challenge continued its ON THE ROAD format, with its 15th edition hosted by the Faculty of Engineering at the University of Porto (FEUP). This edition recognized three outstanding M.Sc. theses and one M.Sc. student, with awardees from the University of Aveiro, the University of Minho, and the Universidade Católica Portuguesa.

5.4
Fraunhofer Portugal in Numbers



6
Management Report 2024

6.1
Economic and Political Background

From the economic perspective, Portugal's economy is projected to grow at 1.7% in 2024, rise to 2.2% in 2025 and 2026, then slow back to 1.7% in 2027. The growth over the next two years is supported by better financial conditions, higher external demand, and more EU funding. However, risks from the global economic and geopolitical environment remain. The labor market will stay strong, with rising employment, real wages, and low unemployment. Fiscal policies will also boost economic activity. In 2027, the slowdown in growth is mainly due to the conclusion of the Recovery and Resilience Plan (PRR). Over the 2024-2027 period, Portugal's growth is expected to outpace the euro area by an average of 0.8 percentage points. Compared to earlier forecasts, growth for 2024-25 has been revised upward, reflecting more fiscal expansion, including new taxes and increased government spending.

Investment in Portugal is expected to pick up in 2025-26, driven by improved financial conditions, a better global outlook, and the boost from EU funds. Current projection foresees that in 2024 the Gross Fixed Capital Formation (GFCF) will grow by just 0.5%, with public investment being the main contributor. From 2025 to 2027, investment growth will improve as interest rates decrease further. Public investment will see a surge in 2025-26 due to more EU funding being used but is expected to decline in 2027 after the conclusion of the Recovery and Resilience Plan (PRR). Another factor of uncertainty is the current geopolitical context, which can bring additional challenges to the industry due to the application of tariffs in key European economic sectors.

In terms of the political background, the result of the elections held in March 2024 lead to a change in the political party that is currently leading a minority government in Portugal, the Social Democratic Party (PSD). PSD is a center-right political party known for its moderate, pro-European, and economically liberal policies, positioning itself as a party that sought to balance market-oriented reforms with social welfare concerns. This change in the government led to creation of the Ministry of Education, Science and Innovation, which concentrates the former Ministry of Education and Ministry of Science, Technology and Higher Education, being now the entities of Scientific and Technology System managed and coordinated by the Secretary of State for Science, Profª Doutora Ana Paiva, which reports directly to the Minister of Education, Science and Innovation, Prof. Doutor Fernando Alexandre.

Regarding the public investment in R&D activities, 2024 has been a year where the Recovery and Resilience Plan (PRR) projects had a significant impact in terms of the overall expenditure. With respect to the area that has a higher link with Fraunhofer Portugal activities, the C05 component - Capitalization and Business Innovation, where the mobilizing innovation agendas are included, a report from the PRR National Monitoring Committee of July 2024 indicated that these specific actions needed follow-up from the national stakeholders, and it recommend to monitor the follow-up model and reduce bureaucracy, provide flexibility during the execution of the projects, evaluate the possibility to extend the projects until the end of the 1st semester 2026, publicize the information about the mobilizing innovation agendas, create a task force to deal with licensing and legislation issues, and operationalize a mechanism to VAT reimbursement.

In terms of the PT2030 framework programme, according to the monthly Bulletin of November 2024 published by the management committee, by the end of November, 11.263 billion euros of European funds had been published in tenders, and 4.4 billion euros had been approved, representing 49% and 19% respectively of the 23 billion euros of funds programmed for 2021-2027. Given the importance of these funds for the sustainability of Fraunhofer Portugal R&D Centers, it is foreseen an increasing participation of Fraunhofer Portugal in several tenders that are currently open and that will be available during 2025, leveraging therefore the position of our organization as an important stakeholder at national and international level in all initiatives that concern with business innovation and applied research.

6.2 Employees

- Increase of FTE in 3,25%;
- 23% of the Team are Scientists with Ph.D.;

Fraunhofer Portugal's success and Human Resources policy is based on the respect for human values, merit, pro-activity, observance of the law, and on knowing how to reach the goals we propose, in order to build a motivated team united towards innovation.

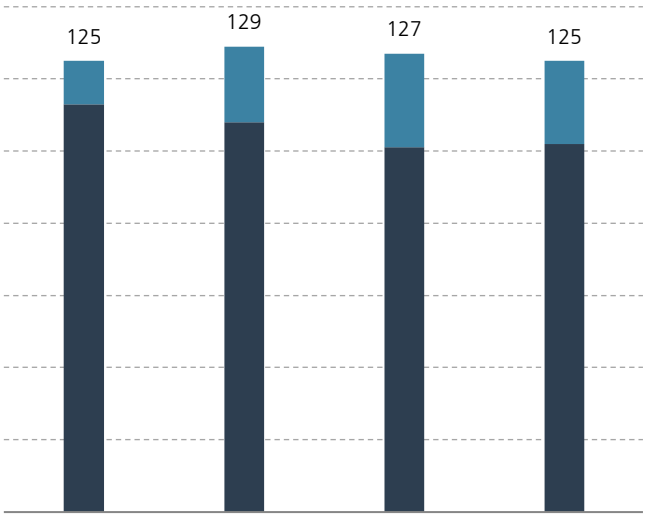
During 2024, we were able to maintain the structure of our team, with an annual average of 100 employees.

With regards to the headcount, during the year of 2024, Fraunhofer Portugal had an average number of 133 collaborators, and we closed the year with a total headcount of 125 collaborators (99 employees, 3 service providers and 23 students).

The effort to disseminate Fraunhofer Portugal's career opportunities, nationally and internationally, continues to provide high levels of success, considering that we have hosted to the team people from countries such as Brazil, Germany, United Kingdom and the Netherlands.

An important outcome of Fraunhofer Portugal's Human Resources policy is the fact that we are strengthening our capacity to train and develop highly skilled professionals, either to grow our team or to leverage the industry sector in Portugal.

Part of our recruitment strategy lays on the fact that every year we select and hire university students and grant holders that we have hosted. In 2024, 5 M.Sc. students joined Fraunhofer Portugal, being this their first work contract in their professional path.



	2021	2022	2023	2024
Total	125	129	127	125
Students	12	21	26	23
Scientific, Technical and Admin. personnel	113	108	101	102

Fig. 05 Fraunhofer Portugal headcount evolution.

6.3
Risks and Risk Management

While performing its activities of applied research and development of innovative technologies, Fraunhofer Portugal takes calculated risks in order not to jeopardise its operation or its relationship with external partners and industry clients. On a regular basis, we implement proactive measures to analyse possible threats to our organisation and we manage them by means of appropriate measures to minimise or eliminate them.

Business Risks
Business risks include those risks arising out of changes in the political, legal and economic framework of applied research.

Geopolitical tensions remain a significant risk, particularly if the existing conflicts escalate or disrupt global markets. Increased protectionism, such as US tariffs and retaliatory measures, could harm global trade and economic activity, making the export sector less predictable and dampening corporate investment. At a national level, delays in the calls of PT2030 funds could bring limitations in the Centers capacity to acquire R&D projects. To minimize this risk, there is a continuous effort to acquire direct industry projects and long-term R&D projects funded by EU programmes.

Financial Risks
Financial risks are those that are rooted in the non-profit association's financial activities.

To manage and control the financial risks, Fraunhofer Portugal actively monitors the financial execution of all projects and their sources of revenue. As an overall strategy, the organization has adopted a methodology that ensures a regular submission of payment requests with the aim of minimise the credit risk and ensure that project's

revenues can be claimed along the execution of the operation. In terms of direct industry contracts, an internal agenda with the expected dates to issue the invoices is maintained, including the validation of milestones achieved through the project, and clients are properly informed about the amounts to be invoiced and the due dates of their open accounts at Fraunhofer Portugal.

Operational Risks
Operational risks include the risk of losses being incurred as a result of the unsuitability or failure of internal processes, people and systems, or due to external events.

To reduce operational risks, Fraunhofer Portugal reviews periodically the implemented processes, which are assessed in periodical external audits, to ensure that the probability of occurring a loss is as low as possible. There's also a whistleblowing channel implemented that provides a mechanism to any person report events that are considered unappropriated within our organization.

Overall Assessment
The current overall assessment of Fraunhofer Portugal's risk situation reveals no significant issues that could significantly endanger its operation in the short term, although some potential problems might occur due to the geo-economical context and the eventual impact in the economic environment, and the changes in the regulation resulting from the transition to the PT2030 framework programme.

6.4
Management Report 2024 – FhP-AICOS

6.4.1
Summary of Key Figures and Ratios

FhP-AICOS Business Development	2024 Actual	2023 Actual
Total Business Volume (Operations and Capital Expenditure) [1]	**5.191.033 €**	**5.185.023 €**
Contract Research (Total Expenses and Research Cap. Expenditure) [2]	**5.191.033 €**	**5.185.023 €**
Project Revenue	**3.262.688 €**	**3.170.594 €**
Employees (FTE)	**83,7**	**84,7**

In 2024, the total headcount of FhP-AICOS reached 85 collaborators at the end of the year, with a total amount 83,7 FTE.

[1] Total Business Volume = OPEX+CAPEX
[2] Contract Research = Total Business Volume - Major Infrastructure Capital Expenditure

Financial KPIs

OPEX	2024	2023
Total labour costs	**3.585.540 €**	**3.493.214 €**
Total non-personnel-costs - internal & external R&D (without depreciation)	**744.260 €**	**887.357 €**
Internal cost allocation	**565.798 €**	**403.315 €**
Total operating expenses	**4.895.599 €**	**4.783.886 €**

CAPEX	
Total CAPEX expenses	**295.434 €**	**311.327 €**

In terms of the Financial KPIs, FhP-AICOS had total labour costs of ~3,6M€ and a total of non-personnel costs of 1,3M€. The total operating expenses represented 4,9M€ at year end.

The CAPEX expenditure represented approximately 295K€ in 2024, being mainly costs incurred with R&D activities.

Revenue	2024	2023
Total Fraunhofer and partner support	**1.632.911 €**	**1.703.102 €**
Total external revenue	**3.262.688 €**	**3.170.594 €**
Total support and revenue	**4.895.599 €**	**4.873.696 €**

Total Fraunhofer and partner support represented 1,6M€ and the total external revenue reached 3,26M€, resulting in a total support and revenue of 4,9M€.

Internal management KPI	
Rho	67%
Rho Industry	35%
Rho Public	17%
Rho EU	13%

These outcomes allowed FhP-AICOS to reach a global management indicator, Rho, of 67%, a Rho Industry of 35%, a Rho Public of 17% and a Rho EU of 13%.

6.4.2
Business Evolution

- Consolidation of FhP-AICOS Total Business Volume above 5,2M€;
- New record of Projects Revenue, above 3,2M€;

In terms of business evolution, in 2024 FhP-AICOS consolidated its total business volume in an amount of approximately 5,2M€. The overall project revenue reached a new record, above 3,2M€

A very important achievement that contributed not only to the positive results of 2024, but also to the sustainability of the Center in the upcoming years, was the contracting of two large EU projects, ACHILLES and SmILE.

Also noteworthy is the consolidated capacity of FhP-AICOS to demonstrate its continued business know-how, setting up new records in both project revenue, surpassing 3,2M€, and total business volume, above 5,19M€.

Comparing with last year, the combined amount of project revenue increased 3%, surpassing 3,2M€.

6.5
Management Report 2024 – FhP-AWAM

6.5.1
Summary of Key Figures and Ratios

FhP-AWAM Business Development	2024 Actual	2023 Actual
Total Business Volume (Operations and Capital Expenditure) 1	**1.723.381 €**	**2.816.563 €**
Contract Research (Total Expenses and Research Cap. Expenditure) 2	**1.723.381 €**	**2.816.563 €**
Project Revenue	**864.444 €**	**686.461 €**
Employees (FTE)	**15,5**	**10,0**

HR KPIs

Staff	2024	2023
Total Headcount end of period	**16**	**10**
Total FTE end of period	**15,5**	**10**

In 2024, the total headcount of FhP-AWAM reached 16 collaborators at the end of the year with a total FTE of 15,5 at the end of 2024.

Financial KPIs

OPEX	2024	2023
Total labour costs	**626.300 €**	**435.664 €**
Total non-personnel-costs - internal & external R&D (without depreciation)	**575.256 €**	**160.985 €**
Internal cost allocation	**242.485 €**	**172.849 €**
Total operating expenses	**1.444.041 €**	**769.499 €**

CAPEX		
Total CAPEX expenses	**279.341 €**	**363.090 €**

[1] Total Business Volume = OPEX+CAPEX

[2] Contract Research = Total Business Volume - Major Infrastructure Capital Expenditure

In terms of the Financial KPIs, FhP-AWAM had total labour costs of ~626K€ and a total of non-personnel costs of 818K€. The total operating expenses represented 1,4M€ at year end. The CAPEX expenditure represented approximately 279K€ in 2024.

Revenue	2024	2023
Total Fraunhofer and partner support	**579.597 €**	**83.038 €**
Total external revenue	**864.444 €**	**686.461 €**
Total support and revenue	**1.444.041 €**	**769.499 €**

Total Fraunhofer and partner support represented 580K€ and the total external revenue reached 864K€, resulting in a total support and revenue of 1,4M€.

Internal management KPI	
Rho	60%
Rho Industry	6%
Rho Public	44%
Rho EU	10%

These outcomes allowed FhP-AWAM to reach a global management indicator, Rho, of 60%, being composed by a Rho Industry of 6%, Rho Public of 44%, and a Rho EU of 10%.

6.5.2 Business Evolution

- Conclusion of the infrastructure investments in Vila Real and focus on operation development;
- Increase of 5,5 FTE;
- Total external revenue of 864K€;

After the initial period of large investments for the implementation of FhP-AWAM's infrastructure, namely the laboratories in Vila Real and Évora, in 2024 it was possible to conclude the constructions works and final arrangements for the operation of the laboratories in Vila Real.

With the conclusion of the laboratories in Vila Real, the main focus of the team was on the execution of the contracted projects, namely the Vine&Wine, METHAREN and H2tAlent projects, being necessary to grow the team and hire additional researchers to fulfill the tasks that are associated to these projects. In terms of headcount there was an increase of 6 people, representing an increase of 5,5 FTE in 2024. Also, as a very positive achievement, in 2024 FhP-AWAM had its first direct contract with an Industry client, being this an important milestone in the development of the Center.

Besides the Vine&Wine project, FhP-AWAM is currently implementing two European projects, METHAREN and H2tAlent.

Overall, a total eternal revenue of 864K€ has been reached by end of 2024.

6.6
Outlook and Strategic Development

When considering the future strategic development of Fraunhofer Portugal, it's crucial to assess the geopolitical context and the European challenges that lie ahead. In recent reports published by the European Commission, namely the Draghi report "The future of European competitiveness" and Manuel Heitor's report "Align, act, accelerate: Research, Technology and Innovation to boost EU competitiveness", it's clear that there is a strong need to increase investment in research and innovation activities in Europe, as a key factor to ensure the competitiveness of European industry in global markets.

The recommendations of these reports provide a clear roadmap for success, as it is essential to involve the main stakeholders of the research and innovation ecosystem at European level to increase the chances of winning in the highly competitive global environment. To be able to succeed and maintain its technological sovereignty, Europe will have to accelerate investments in key critical technologies such as Artificial Intelligence and Energy, being these technological areas part of the core competencies of Fraunhofer Portugal's R&D centers.

Fostering large-scale collaborations between SMEs and R&D organizations in different Member States is also one of the challenges identified in these reports, and Fraunhofer Portugal's R&D centers are well positioned to strengthen their positioning as key gatekeepers and connectors within the broader European innovation ecosystem. By collaborating in pan-European initiatives such as AISym4Med, ACHILLES, SmILE, METAHREN and H2tAlent, FhP-AICOS and FhP-AWAM can make a strong contribution to the implementation of cross-border innovation projects that can have a strong impact on the green and digital transition, namely in advanced digital technologies and green technologies.

Analyzing the backlog of projects for 2025, it is clear that both centers have already secured a significant amount of revenue through research contracts, but looking further ahead, another important factor that emerges from the current context is the planned termination of the Recovery and Resilience Plan (PRR), which is expected to occur by the end of the first semester of 2026 at the latest. Since 2022, the Innovation Agendas have provided a stable and significant amount of funding for the R&D activities carried out in FhP-AICOS and FhP-AWAM, but with the end of these projects, it is important to identify and apply for appropriate calls at national and EU level, namely in the PT2030 Framework Programme and Horizon Europe. While in PT2030 it is expected to have several opportunities in calls with a moderate level of competition, the situation in Horizon Europe remains the same, being the current level of competiti-veness very high, which requires a higher level of scrutiny of the initiatives to be engaged.

We are confident about the future and believe that this fantastic team, which year after year has proved its exceptional skills, will once again excel and show extraordinary results, something that is only possible when we work as a team and develop a collective effort that is greater than the sum of the individual contributions of each one of us! We move on together to the next challenges, and regardless of the adversities we encounter along the way, we know that victory is within our reach, and we naturally count on our long-standing strategic partners to guide us and contribute to our collective success.

Long live Fraunhofer Portugal and it's amazing team!

Pedro Almeida
President of the Executive Board

Perspetivas e Desenvolvimento Estratégico

Na reflexão sobre o desenvolvimento estratégico futuro da Fraunhofer Portugal, é fundamental avaliar o contexto geopolítico e os desafios europeus que se colocam. Nos recentes relatórios publicados pela Comissão Europeia, nomeadamente o relatório Draghi "O futuro da competitividade europeia" e o relatório de Manuel Heitor "Alinhar, agir, acelerar: Investigação, Tecnologia e Inovação para impulsionar a competitividade na UE", é clara a necessidade de aumentar o investimento em atividades de investigação e inovação na Europa como um fator-chave para garantir a competitividade da indústria europeia nos mercados globais.

As recomendações destes relatórios fornecem um roteiro claro para o sucesso, uma vez que é essencial envolver as principais partes interessadas do ecossistema de investigação e inovação a nível europeu para aumentar as hipóteses de vencer no ambiente global altamente competitivo. Para ser bem-sucedida e manter a sua soberania tecnológica, a Europa terá de acelerar os investimentos em tecnologias críticas chave como a Inteligência Artificial e a Energia, sendo estas áreas tecnológicas parte das competências nucleares dos centros de I&D da Fraunhofer Portugal.

A promoção de colaborações em larga escala entre PMEs e organizações de I&D em diferentes Estados-Membros é também um dos desafios identificados nestes relatórios, e os centros de I&D da Fraunhofer Portugal estão bem posicionados para reforçar o seu posicionamento como principais guardiões e conectores dentro do ecossistema de inovação europeu mais alargado. Ao colaborar em iniciativas pan-europeias como AISym4Med, ACHILLES, SmILE, METAHREN e H2tAlent, o FhP-AICOS e a FhP-AWAM podem dar um forte contributo para a implementação de projetos de inovação transfronteiriços que podem ter um forte impacto na transição verde e digital, nomeadamente em tecnologias digitais avançadas e tecnologias verdes.

Analisando a carteira de projetos para 2025, é evidente que ambos os centros já asseguraram um montante significativo de receitas através de contratos de investigação, mas olhando para o futuro, outro fator importante que emerge do contexto atual é o termo previsto do Plano de Recuperação e Resiliência (PRR), que deverá ocorrer, o mais tardar, no final do primeiro semestre de 2026. Desde 2022, as Agendas de Inovação têm proporcionado um montante estável e significativo de financiamento para as atividades de I&D realizadas no FhP-AICOS e no FhP-AWAM, mas com o fim destes projetos, importa identificar e candidatar-se a concursos adequados a nível nacional e europeu, nomeadamente no Programa-Quadro PT2030 e no Horizonte Europa. Enquanto no PT2030 se prevê que existam várias oportunidades em convites com um nível de concorrência moderado, a situação no Horizonte Europa mantém-se igual, sendo o atual nível de competitividade muito elevado, o que exige um maior nível de escrutínio das iniciativas a contratar.

Estamos confiantes no futuro, e acreditamos que esta equipa fantástica que ano após ano tem dado provas das suas competências excecionais vai, mais uma vez, superar-se e mostrar resultados extraordinários, algo que só é possível quando trabalhamos em equipa e desenvolvemos um esforço coletivo que é superior à soma da dos contributos individuais de cada um de nós! Seguimos juntos para os próximos desafios, e independentemente das adversidades que encontrarmos no caminho, sabemos que a vitória está ao nosso alcance, sendo que contamos naturalmente com os nossos parceiros estratégicos de longa data para nos orientarem e contribuírem para o sucesso coletivo.

Viva a Fraunhofer Portugal e a sua fantástica equipa!

Pedro Almeida
Presidente da Direção

Acronyms

ADM	Administrative
AHED	Advanced Health Education
AI	Artificial Intelligence
AICOS	Fraunhofer Centre for Assistive Information and Communication Solutions
ALS	Amyotrophic Lateral Sclerosis
ANI	Agência Nacional de Inovação
APS	Administração dos Portos de Sines e do Algarve
AWAM	Fraunhofer Centre for Smart Agriculture and Water Management
BMP	Biochemical Methane Potential
CAPEX	Capital Expenditure
CCDR-N	Comissão de Coordenação e Desenvolvimento Regional do Norte
CCILA	German-Portuguese Chamber of Commerce and Industry
CHR	Clinical High Risk
CISUC	Centre for Informatics and Systems of the University of Coimbra
CITEVE	Centro Tecnológico das Indústrias Têxteis e do Vestuário de Portugal
CMU	Carnegie Mellon Universty
CoLAB	Collaborative Laboratorie
COTEC	Associação Empresarial para a Inovação
CT	Connected Things
CTM	Centre for Telecommunications and Multimedia of INESC TEC
ECG	Electrocardiogram
EoP	Ending of the Period
EU	European Union
FBAUP	Faculdade de Belas Artes da Universidade do Porto
FCT NOVA	Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa
FCT	Foundation for Science and Technology
FEP	Faculdade de Economia da Universidade do Porto
FEUP	Faculdade de Engenharia da Universidade do Porto
FhG	Fraunhofer-Gesellschaft
FhP	Fraunhofer Portugal
FhP-AICOS	Fraunhofer Portugal AICOS
FhP-AWAM	Fraunhofer Portugal AWAM
FOKUS	Fraunhofer Institute For Open Communication Systems
FTE	Full Time Equivalent
GFCF	Gross Fixed Capital Formation
GOV	Governance
HCD	Human-Centred Design
HR	Human Resources
ICT	Information and Communication Technologies

INCM	Imprensa Nacional Casa da Moeda
INESC TEC	Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência
INVICTA	School of VIsion, Computational intelligence, and patTern Analysis
IoT	Internet of Things
IPO	Instituto Português de Oncologia
IRC	Imposto sobre o Rendimento de Pessoas Coletivas
IRS	Imposto sobre o Rendimento de Pessoas Singulares
IS	Intelligent Systems
ISEP	Instituto Superior de Engenharia do Porto
IST	Instituto Superior Técnico
IT	Information Technology
IVA	Imposto sobre o Valor Acrescentado
KPI	Key Performance Indicator
MBA	Master of Business Administration
Mkt&Com	Marketing and Communication
M.Sc.	Master of Science
MSK	Musculoskeletal
ML	Machine Learning
NEEF	Engineering Physics Student group of the Aveiro University
OCR	Optical Character Recognition
OPEX	Operational Expenditure
Ph.D.	Doctor of Philosophy
P&L	Profit and Loss
PRR	National Recovery and Resilience Plan
PSD	Partido Social Democrata
R&D	Research and Development
RTO	Research & Technology Organization
SRA	Strategic Research Agenda
TS	Total Solids
TWS	Thursdays with Science
UA	Universidade de Aveiro
UE	Universidade de Évora
UC	Universidade de Coimbra
UHR	Ultra-High-Risk
UI	User Interface
UP	Universidade do Porto
US	United States
UTAD	Universidade de Trás-os-Montes e Alto Douro
VAT	Value Added Tax
VCMI	Visual Computing and Machine Intelligence group of the Centre for Telecommunications and Multimedia of INESC TEC.
VS	Volatible solids
WIP	Work in Progress
XAI	Explainable Artificial Intelligence

Associação Fraunhofer Portugal Research
Rua Alfredo Allen 455/461
4200-135 Porto, PORTUGAL