

The IDEKO logo is positioned in the top left corner. It features the word "IDEKO" in a bold, sans-serif font. The "I" and "D" are blue, while "EKO" is white. The background of the entire image is a deep blue with a complex network of glowing white and blue lines and dots, resembling a molecular or digital structure. A glowing DNA double helix is visible in the center, and a robotic hand is reaching up from the bottom left towards a human hand reaching down from the bottom right, with a bright light at their point of near-contact.

# IDEKO

MEMBER OF BASQUE RESEARCH  
& TECHNOLOGY ALLIANCE

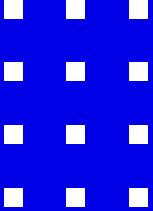
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# '22

## ANNUAL REPORT

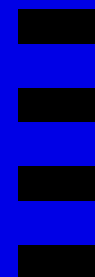
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***ideko.es***



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## 01. Institutional message



**XABIER ALZAGA**  
President of IDEKO

In 2022 we have continued to take steps forward to increase our commitment to manufacturing and consolidate our position at the scientific-technological forefront in the field of research and advanced manufacturing. Proof of this, is that we have managed to surpass a 10 million Euro turnover, 49% of which came from contracts with companies and the remaining 51% from our own research activities.

Thanks to the 10.3 million euros earned, we continue our upward progression, exceeding the 9.8 million euros invoiced the previous year. Specifically, IDEKO has earned 5.01 million euros (49% of the total) through R&D projects with companies from the machine tool, aeronautics, railroad, automotive and oil & gas sectors, mainly. The remaining 5.4 million euros (51%) came from our own research activities. These figures highlight our commitment to technology transfer to the industrial tissue of our environment, the Basque Country.

In addition to our commitment to manufacturing, our commitment to people continues to be one of the strategic pillars of the center's work. In terms of human capital, the center has closed the year 2022 with a workforce of 128 professionals, of which 31% are doctors. This figure will increase in the near future, as eight of our professionals are currently working on their doctoral thesis at the center.

Achieving these good results would have been impossible without the effort, commitment, resilience and dedication of all the people who make up the center. The team has managed to carry out this work without leaving scientific excellence aside, a fundamental aspect of the center. In fact, last year we kept up with our dissemination activity with a total of 33 indexed publications, of which 19 were Q1, a certification that marks the excellence of the publications. As for the number of patents, the center has reached the figure of 39 active patents; 7 of which were granted in 2022. Specifically, two of them were obtained in collaboration with other agents of the Basque Science, Technology and Innovation Network (RVCTI).

We would also like to extend our thanks to the collaborating companies, as their firm commitment to innovation and the trust they have placed in us have contributed to the great results of 2022. Thanks, once again, to the whole IDEKO family for making this possible.



**NEREA ARANGUREN**  
Managing Director of IDEKO

Last year we embarked on a new path with the launch of the new Research Plan for 2021-2024. A roadmap that places artificial intelligence in manufacturing and the precision of machines and processes among our research and development priorities for the future.

This plan was built with a clear objective in mind: to be able to anticipate manufacturing transformations and respond to the needs of industry. It also establishes research into digital twins, robotics, active and intelligent components and strategic part application processes, as a priority for the next four years. All these processes, which are already at different stages of development, include environmental sustainability and the principles of the circular economy in a cross-cutting manner. In this way, we maintain our commitment to specialization from a sustainable point of view, to not only grow economically, but also generate greater well-being in society, guaranteeing a better future for future generations.

With our goal of sustaining progress in all our areas of specialization, during 2022 we have maintained an active policy in the field of alliances and collaborations. In addition, we actively cooperated in the development of key technologies to take the leap from conventional machines to smart and connected ones. In this sense, we have supported the company Savvy Data Systems in the development of its Smart Box platform, which has become one of the benchmarks in the sector.

IDEKO has been a key player in the development of the technologies required to integrate this platform into the needs and particularities of machine tool manufacturers and users. To achieve this, we have collaborated directly with companies that use the technology in highly demanding sectors such as aeronautics, power generation and capital goods.

In terms of events, 2022 has also been an outstanding year for us. The return of the Machine Tool Biennial in June, that had been suspended in 2020 due to the pandemic, and the co-hosting in the Basque Country of the General Assembly of CIRP, the main international forum on Advanced Manufacturing, at the end of August have been the two main events in which the center has taken part this year. Milestones that confirm once again IDEKO's role as a center of reference in advanced manufacturing.



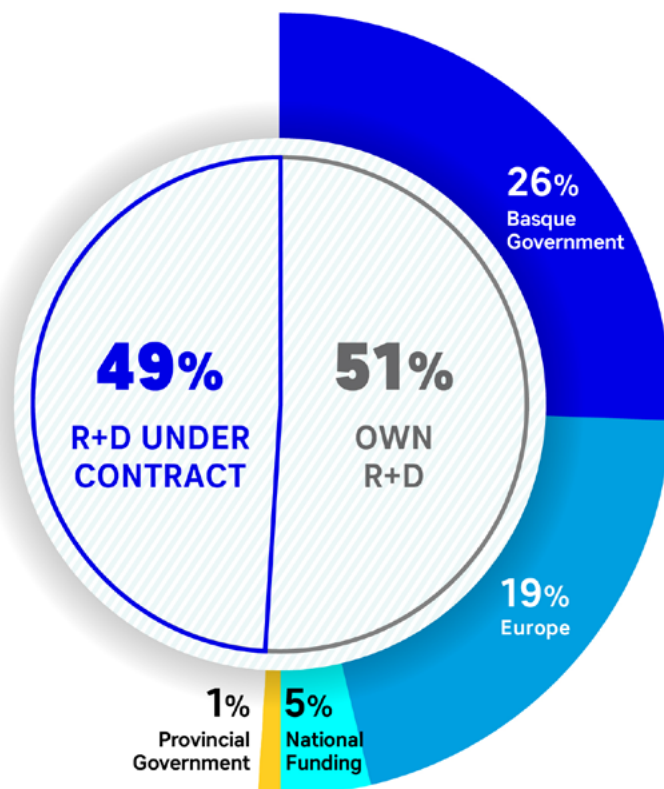
## 02. IDEKO in figures

**10,3M€** Total incomes



**51%** Own R+D

**49%** R+D Under Contract



**128**

Total staff

**27% Women** / **73% Men**

**116**

Staff

**12**

People in training

**31%**

PhDs

**8 PhD theses in progress**



**39**

Patents

**7 in 2022**

**>150**

Technology Transfer Projects

**>30**

Years coordinating European Projects

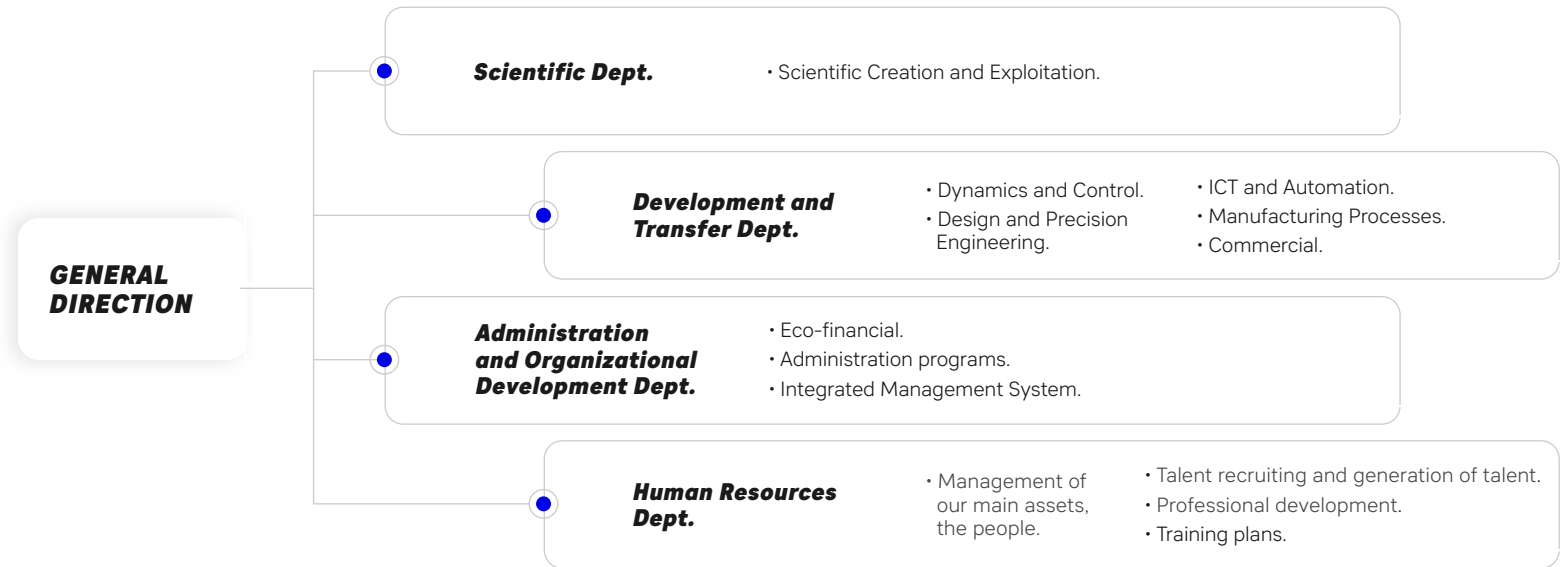
## 03. About us



### 1 ABOUT US

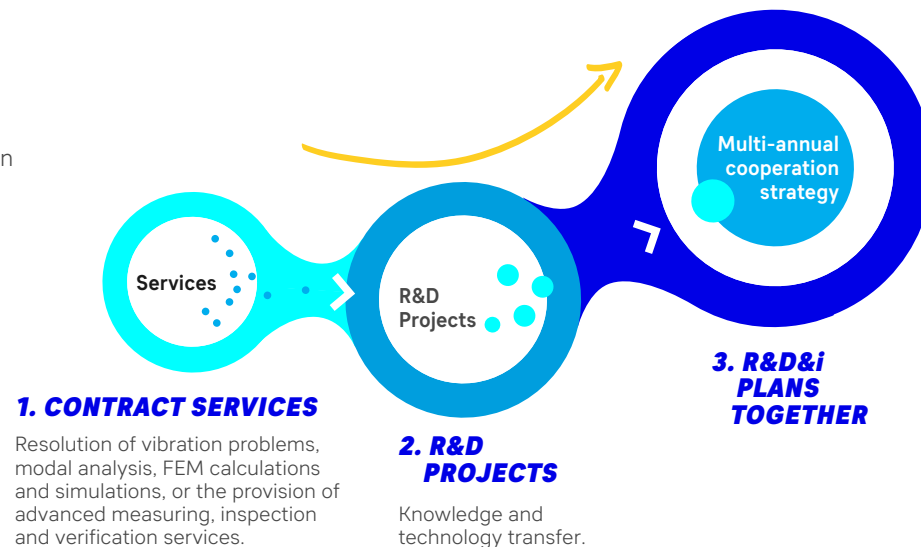
We are a research center specialized in advanced manufacturing, with special focus on precision machines and processes and artificial intelligence in manufacturing. We generate, capture and develop new technologies capable of responding to the current and future challenges of the industry. Our activity covers the identification and analysis of opportunities, the design and development of products, business lines and production processes and the resolution of problems through the provision of technological services such as technical consultancy and equipment based services.

### 2 ORGANISATION



### 3 COLLABORATION OF IDEKO WITH COMPANIES

**TECHNOLOGICAL PARTNER**  
we offer an **integral solution** for the needs of today and the future in advanced manufacturing.



## 03. About us

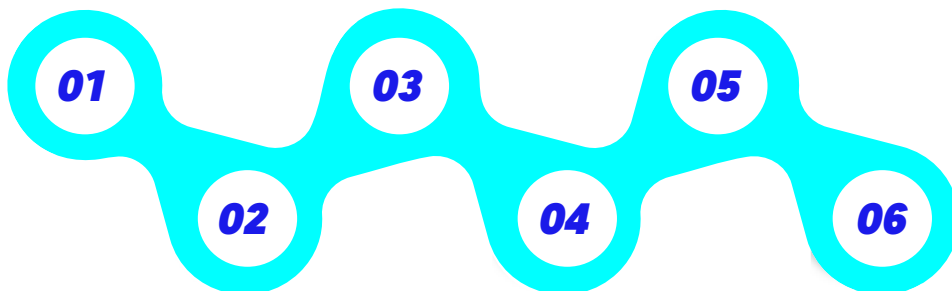
**4**  
4 RESEARCH  
GROUPS

**5**  
6 SPECIALIZATION  
LINES

**MACHINE AND  
PRECISION  
PROCESSES**

**ACTIVE  
AND SMART  
COMPONENTS**

**STRATEGIC PARTS  
PROCESSES AND  
APPLICATIONS**



**ARTIFICIAL INTELLIGENT  
IN MANUFACTURING**

**SIMULATION  
DIGITAL TWINS**

**ROBOTICS**

### ICT AND AUTOMATION

- Value-added industrial automation:
  - Predictive and proactive maintenance.
- Cloud Computing.
- Advanced Programming.
- Artificial Intelligence.

**01**



### DYNAMICS AND CONTROL

- Dynamic behaviour of machines:
  - Self-excited vibrations.
  - Damping.
  - Advanced control algorithms.
  - Mechatronics simulation.
- Advanced robotics.

**02**



### DESIGN AND PRECISION ENGINEERING

- Advanced concepts of machines and components:
  - Mechanical and thermal simulations.
  - Ecodesign.
- Non-contact dimensional measurement.
- Machine vision.

**03**



### MANUFACTURING PROCESSES

- Development of cutting and abrasion machining technologies.
- Sustainable manufacturing.
- Industrial management and production.
- Composite technologies.
- Laser technologies: Cutting processes and additive manufacturing.
- NDT Inspection of superficial and internal defectology.

**04**



## 04. Projects

### 6 R&D PROJECTS

Cognitive robotics for the intelligent manufacturing of composite materials.

Smartization of foundry core manufacturing process.

Digital transformation and efficient use of resources through non-destructive inspections.

UT 4.0 automatic evaluation of forging flanges.

Accuracy in critical ultra near net shape components obtained by 2030 processes.

Your aeronautical digital smart factory.

Advanced technologies for the development of materials, nanomaterials and flexible automated (multi-operational) manufacturing processes for multi-material / multi-functional parts processing and embedded sensing.

Ultra-precise, reliable and coordinated mechatronics for Industry 4.0.

Digital twins for continuous precision control in high performance machine tools.

Development of dynamic digital twins for large machine tools with high productivity.

Vibration elimination in high value parts.

Machining of alloys with difficult machinability.

Development of high-speed, high-performance heads for milling and grinding processes.

Virtual reality for the start-up of advanced manufacturing cells or lines.

Sustainable life cycle for machine tools based on Digital Twins.

New concept of high-performance transfer for high production machining.

Towards the new industrial ecosystems of 2030, driven by the new generation of cognitive machine tools, able to learn and act autonomously and empathetically.

Robotics and automation for carbon fiber component manufacturing.

Advanced robotic technologies.

Design and development of an ultra-compact heat pump.

### EUROPEAN PROJECTS

#### SERRANO

Applications for more secure, faster and cognitive cloud computing.

#### COGNIPLANT

Development of digital technologies for equipment diagnostics and process monitoring in the continuous production industry.

#### DAT4.ZERO

Digitally improved quality management system, that compiles and organises data of a distributed multiple sensor network.

#### INTERQ

Digital technologies for the integrated treatment of quality in zero-defect manufacturing.

#### LEVEL-UP

Reconditioning and digitalisation of production lines for prolonging their useful life and adapting them to the current connected and digital equipment trends.

#### TEAMING-AI

Human-AI platforms for Artificial Intelligence evolution in manufacturing.

#### FIBREMACH

Robotic system for machining composites by internal chip suction (clean, precise and flawless).

#### DYNAMITE

Large dimension metrology by photogrammetry for manufacturing technologies and process control.

#### VERSO

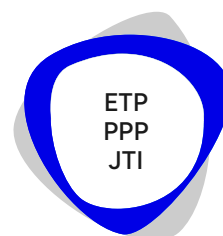
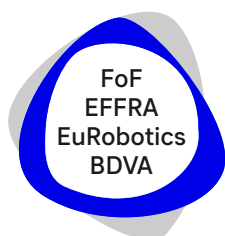
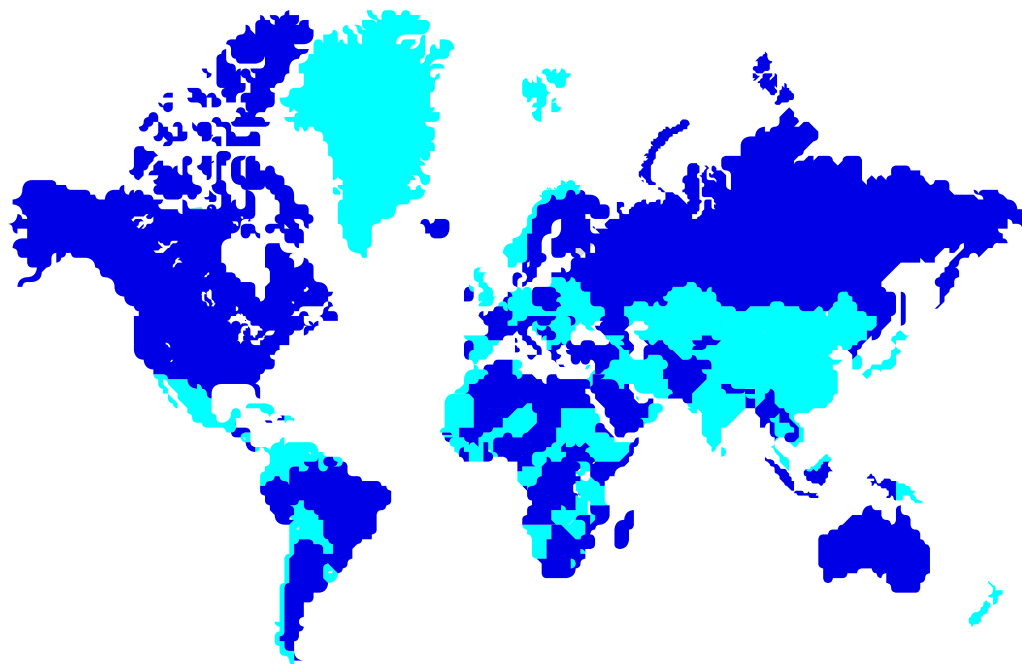
Versatile clamping system with active vibration compensation for flexible parts manufacturing.

#### INFINITE

Aerospace Composites digitally sensorised with microwires, from design and manufacturing to end-of-life (recycling).

## 05. Alliances and collaborations

### 8 ALLIANCES AND COLLABORATIONS



BUCAREST UNIV., BWI, CEA, CEDRAT, CERN, CESI, CETIM, CHALMERS, CNRS, CRF-FIAT, D'APPOLONIA, DELCAM, DELFT UNIV., DTI/DTU, EPFL LAUSANNE, ETH ZURICH, EUROCHILE, FIDIA, FLANDERSMAKE, GTS, HELLAS, IBS, IFW / LZH HANNOVER, INESCPORTO, INRIA, IPA FHG STUTTGART, IPT / WZL / ILT / FHG / AACHEN, ITIA, IWU / TU CHEMNITZ, KALE AERO, KTH, STOCKHOLM, KU LEUVEN, LINZ, MONTERREY, NPL, NTNU / SINTEF, POLIMI, PONTIFICIA PERU, PRAGA UNIV., PRIMA, PROFACTOR, PTW DARMSTADT, SIRRI, SOCIESC, SWEREA, SZTAKI BUDAPEST, TEKNIFORETAGEN, TIMKEN, TNO, TU, ORTMUND, TU DRESDEN, TU EINDHOVEN, TUT TAMPERE, TWI, TYROLIT RTD, UNIV. ANKARA, UNIV. BRITISH COLUMBIA, UNIV. CALIFORNIA, UNIV. COSTA RICA, UNIV. ESTAMBUL, UNIV. GRAZ, UNIV. KEIO, UNIV. KOBE, UNIV. KOC, UNIV. LISBOA, UNIV. MASSACHUSETTS, UNIV. MICHIGAN, UNIV. NAGOYA, UNIV. PATRAS, UNIV. SABANCI, UNIV. SAO PAULO, UNIV. SETUBAL, UNIV. SOFIA, UNIV. TESALONICA, UNIV. WATERLOO, UNIV. CRANFIELD, UNIV. NOTTINGHAM, UNIV. OULU, UNIV. PADOVA, UNIV. SHEFFIELD + AMRC, UOB / BIBA / LFM BREMEN, VTT, WARSAW UNIV.





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& TECHNOLOGY ALLIANCE

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📍 Zuatzu Business Park.  
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