

Sustainability Report 2022





CHAPTER 3

INNOVATION AT THE HEART OF OUR IDENTITY

AN APTITUDE FOR INNOVATION THAT BECOMES A SYSTEM 3.1

RESEARCH AND DEVELOPMENT 3.2

FUNDED PROJECTS



3. INNOVATION AT THE HEART OF OUR IDENTITY

Continuous research and development is an aspect inherent to our very identity: without a constant striving for innovation, our products, characterised by a high technological content, could not be competitive.

We are aware that **innovation means creating value from something that did not exist before**, be it a product, a service, a business model or an organisation, generating positive effects not only economically, but also environmentally and socially.



Left:
NEW-RE project topic



3.1 INNOVATION THAT BECOMES A SYSTEM

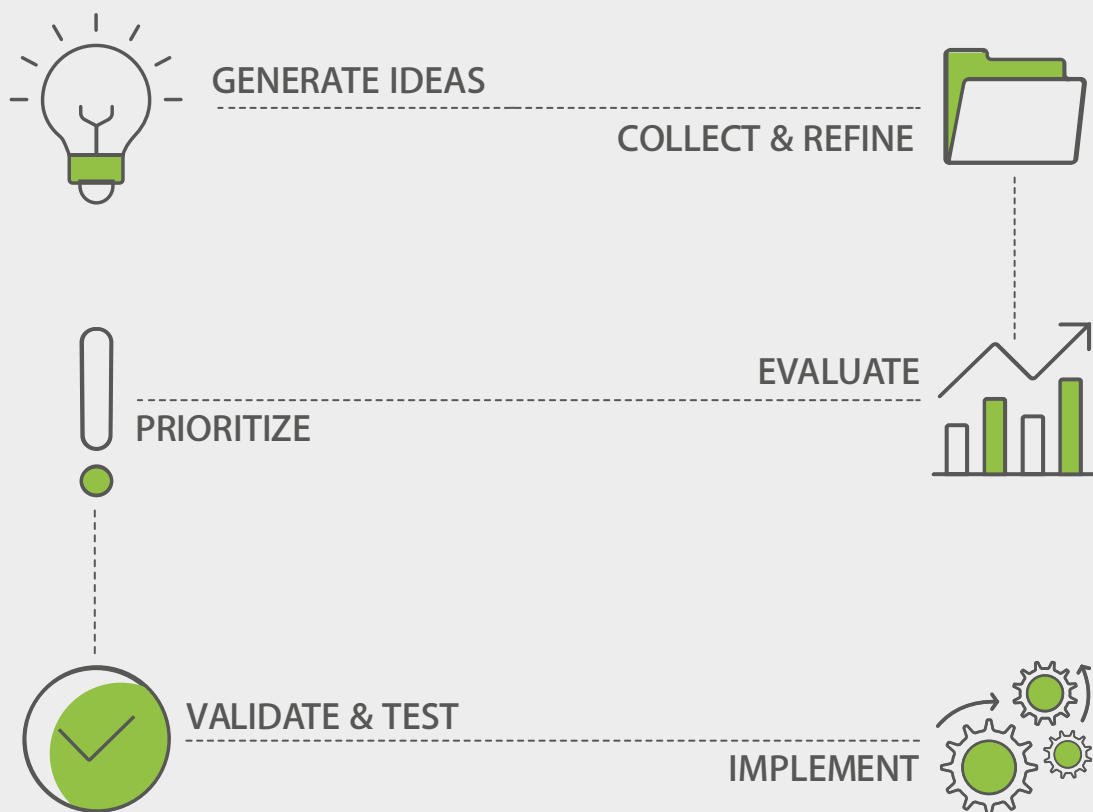
We decided to draw inspiration from the **ISO 56000**, which provides guidance for the establishment, implementation, maintenance and continuous improvement of a **management system** for innovation; we are convinced that such a tool can help us to capture the best ideas, refine ourselves and maintain a competitive advantage in the market.

We set up the **Innovation & Development Committee (CI&S)** precisely to promote research activity and to ensure transparency and traceability in projects in this field. The Committee proposes to the Board of Directors the initiatives it deems deserving and a priority to ensure development un-

der the banner of innovative technologies. In particular, the Committee is a promoter of collecting and **managing ideas**, so that they can become the object of investment and thus create new opportunities. Idea management is a systematic process that aims to make the most of the collection and development of meaningful insights.

The following image graphically depicts the flow of the process, the last two steps of which are the responsibility of the Board of Directors, which also defines the investments required for the introduction into the system.

Through specific actions and dedicated campaigns, the Committee encourages and gathers



proposals, both from internal actors and from the supply chain of which we are part, in different contexts, among which we find:

- development of alternative technologies and new functionalities on existing products;
- new products, processes or services;
- membership and participation in European/ funded projects;
- feasibility studies, market analysis, and research for new applications.

We have also identified four distinct areas on which to work to further extend the field of ac-

tion of our attitude toward innovation: strategy, processes, tools/methods and organizational culture.

The Committee has also defined an objective method for evaluating the ideas received and for attributing a score that quantifies their relevance, their relation to corporate strategies and their expected impact; it is on the basis of the score obtained that we select the proposals to be submitted to the Board of Directors, and then, in the event of approval, to follow them up operationally.



3.2 RESEARCH AND DEVELOPMENT

R&D activities are handled by a dedicated team of people who also collaborate with specialists from all over Europe.

The total investment in innovation and development for the financial year 2022 amounts to **Euro 2.92 million** (Euro 2.54 million in 2021) of which Euro 2.32 million was recorded under fixed assets. The innovation and development was financed with Euro 0.25 million was financed by contributions from the European Community for innovation projects, Euro 0.35 million from public grants to support research and development projects, and Euro 2.32 million from capitalisation.

The development projects implemented can be grouped into 7 clusters identifying different types of activities, markets of interest or end applications:

P0021-STH, Semiconductor Testing Handling

It includes all activities related to the semiconductor industry, particularly to conditioning and testing technologies for MEMS sensors or power modules.

P0023-SCA, Silicon Carbide Addition

This cluster includes the conception, design and implementation of a system for silicon carbide addition processes for power electronics and automotive.

P0025-EMF, E-mobility Factory

It embraces the activities related to the field of electric mobility, particularly with reference to implementation of systems for the production, testing, inspection, and validation of electric handling components or systems.

P0026-MED, Biomedical Automation

It concerns the development of innovative solutions such as state-of-the-art laser systems to be applied to medical products.

P0027-CEA, Circular Economy Automation

It includes activities related to the circular economy sector, including the recovery of precious metals from Waste Electrical and Electronic Equipment (WEEE). In this area, systems equipped with advanced vision stations, analysis and control techniques with artificial intelligence, and expert vision systems for selective recognition and segregation are developed.

P0028-HTA, High Tech Automation

It includes the activities related to the field of automation applied to high-tech sectors, for example based on artificial intelligence systems and human-robot collaboration.

P0029-CRA, Cross Activities

It includes several cross-cutting activities that have spin-offs, developments or potential for integration in two or more clusters.



FUNDED PROJECTS



Progetto: NEW-RE

Titolo: Neodymium and Rare Earth from Waste Recycling

MANUELA

Progetto: MANUELA

Titolo: Pilot Line for Metal Additive Manufacturing.

RISORSA

Progetto: RISORSA

Titolo: Sustainable recycling of rare earth magnets from WEEE



Progetto: APRIL

Titolo: Multi-function robotics for handling deformable materials in manufacturing processes



Progetto: VOJEXT

Titolo: Value of joint experimentation in digital technologies for manufacturing and construction.

We participate in several funded projects, thanks to which we have the opportunity to confront international realities and collaborate with professionals with cultures and paths different from our own. The projects of this type that will be active in 2022 are briefly described below.



Project NEW-RE Neodymium and Rare Earth from Waste Recycling (2022-2024)

Funding: KIC - EIT RawMaterials

The project addresses the challenge of recycling neodymium permanent magnets contained in hard disks and the possibility of recovering those contained in electric vehicle motors. As OSAI, we are involved in the creation of a prototype for the disassembly of hard disks with a fully automated or semi-automated approach.

The objective is the recycling of the elements called 'rare earths' by exploiting and improving an existing hydrometallurgical treatment plant.



Multi-function robotics for handling deformable materials in manufacturing processes (2020-2024)

Funding: European Union H2020. Research Innovation Action (RIA)

The project aims to develop a low-cost, multi-functional industrial robot system that supports semiautomatic tasks in manufacturing production lines of different sizes or types that use flexible or deformable materials. APRIL is based on computer vision techniques and on the development of modular interfaces; it will provide innovative sensors and augmented vision to support the detection of deviations, weight estimation, dynamic centre of mass or adjustment of gripping forces while handling deformable objects. Our contribution consists in the realisation of a demonstrator to integrate and validate the pro-



ject results in an industrial application.

RESOURCE - Sustainable recycling of rare earth magnets from WEEE (2022-2023)

Funding: Ministry of the Environment call for co-funding of research projects aimed at developing new technologies for the recovery, recycling and treatment of waste electrical and electronic equipment (WEEE)

The research activity aims to offer an innovative way to recycle rare earth magnets found in WEEE. Worldwide demand for these elements, including the neodymium contained in hard disks, is growing steadily in countless industries, including the automotive sector. At present, hard disk drive magnets cannot immediately be reused in different applications as it is not possible to recycle them by changing their geometry at an affordable cost. The primary goal of the project is to develop a less energy- and environmentally-impactful way to reuse rare earth magnets as secondary raw materials.

Our contribution is to study automated disassembly strategies and processes for the recovery of rare earth magnets from disused hard disks.

MANUELA

Pilot Line for Metal Additive Manufacturing (2018-2023)

Funding: European Union H2020. Demo Action
Metal Additive Manufacturing (AM) is a metal 3D printing technique that enables, through the implementation of a specific design, the production of high value-added components with advanced features that are difficult to achieve with conventional processes. At present, however, this technique involves a high number of critical steps and the key competencies related to these steps are not fully implemented at industry level.

MANUELA aims to define a pilot line plant, which covers the entire production sequence, from the

raw material, understood as metal powders, to the surface treatments related to the post-processing of manufactured goods. It was for the latter that we realised a prototype system with laser technology.



Value of joint experimentation in digital technologies for manufacturing and construction (2020-2023)

Funding: European Union H2020. Innovation Action (IA)

The project aims to create a favourable economic and technological environment to enable matchmaking and support manufacturers and industries (mainly SMEs, including small artisans) of autonomous cognitive systems for human-robot interaction. A special focus in the project is on "cobots", a term indicating collaborative robots, dynamizing technology applications for the European market.

To this end, VOJEXT will design, develop, validate, and demonstrate the usability of reliable, market-oriented, agile, multipurpose, and easily reused robotic systems. The developed solution is based on autonomous, mobile and skilful robotic solutions as the main component of an intelligent and scalable cognitive CPS¹ for industrial applications.

The aim is to provide a Value Of Joint EXperimentation (VOJEXT) of digital technologies in the manufacturing and construction industry. Our contribution consists in the realisation of a demonstrator to integrate and validate the project results in an industrial application.

Left:

Depanelized PCB handling system, 2021

1. Cyber Physical System