THE EUROPEAN ASSOCIATION OF RESEARCH & TECHNOLOGY ORGANISATIONS

RTOs' success stories

RTOs' Pivotal Role in Advancing EU Tech Development & Fostering Industry, Start-ups and Scale-ups Ecosystems

EARTO
IMPACT DELIVERED

4 June 2025






RTOs' Pivotal Role in Advancing EU Tech Development & Fostering Industry, Start-ups and Scale-ups Ecosystems

Research and Technology Organisations' (RTOs) capabilities, covering their technology infrastructures, partnerships with industry, experience, skills, etc. serve as invaluable assets supporting the growth of existing industries and fostering the creation of new ones. Furthermore, RTOs serve as key drivers in the European start-up and scale-up ecosystem by supporting companies' technology development and maturation while also launching their own spin-offs as a direct result of their RD&I activities. As an example, the 15 RTOs which took part in the recent EARTO Economic Footprint Study 2024, have launched around 400 deep-tech spin-offs in two years generating a turnover of more than € 5 billion. These spin-offs have a greater life expectancy (9.7 years) and low rate of failure.

EARTO therefore gathered some success stories showcasing RTOs' pivotal role in advancing EU tech development and fostering industry, as well as start-ups and scale-ups creation and ecosystems. These RTOs' success stories stem from RD&I collaborations that can fall into three categories:

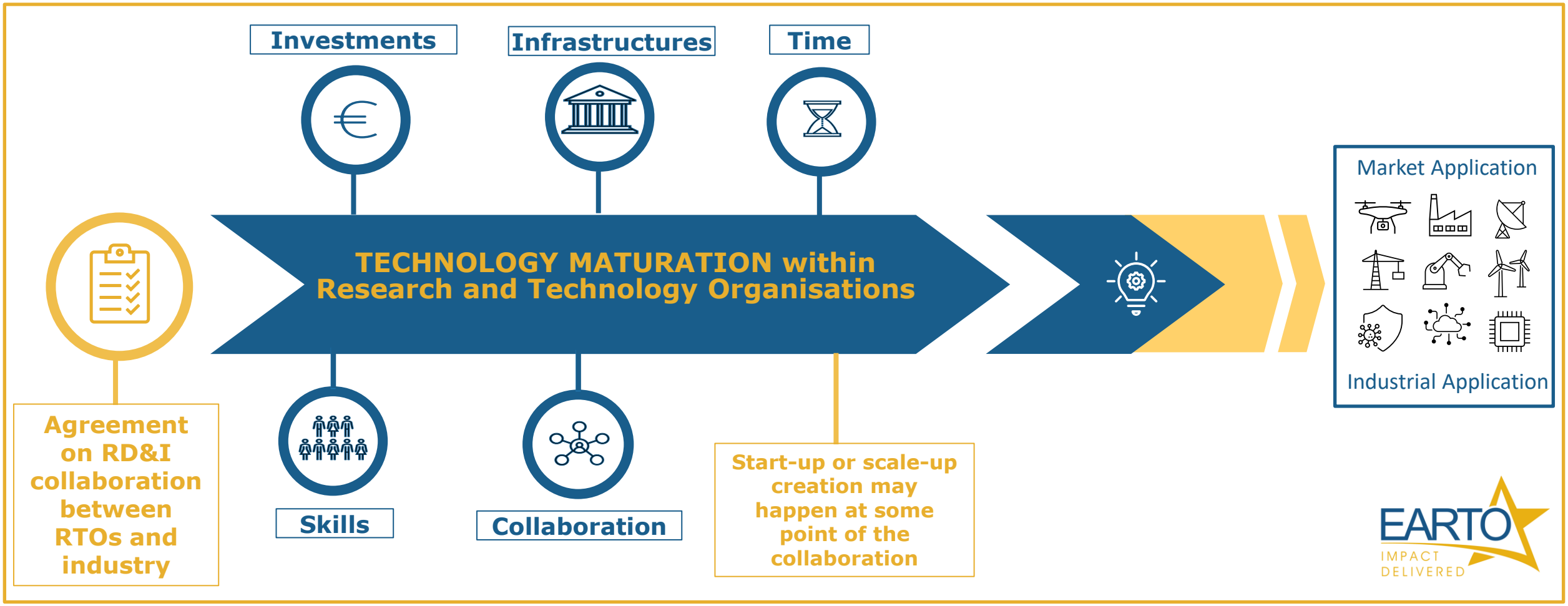
- **RD&I collaboration between research player(s) and an established company**
- **RD&I collaboration among research players to nurture a technology, which is then scaled up by an established company or a start-up**
- **RD&I collaboration between research player(s) and a start-up or a scale-up**

The technologies developed and commercialised through these collaborations enhance European competitiveness and, to a large extent, provide the EU with a competitive advantage in technologies identified by the European Commission (EC) as critical in the Net-Zero Industry Act (NZIA), the EC Communication on Economic Security, or within the Strategic Technologies for Europe Platform (STEP).

EARTO
IMPACT DELIVERED

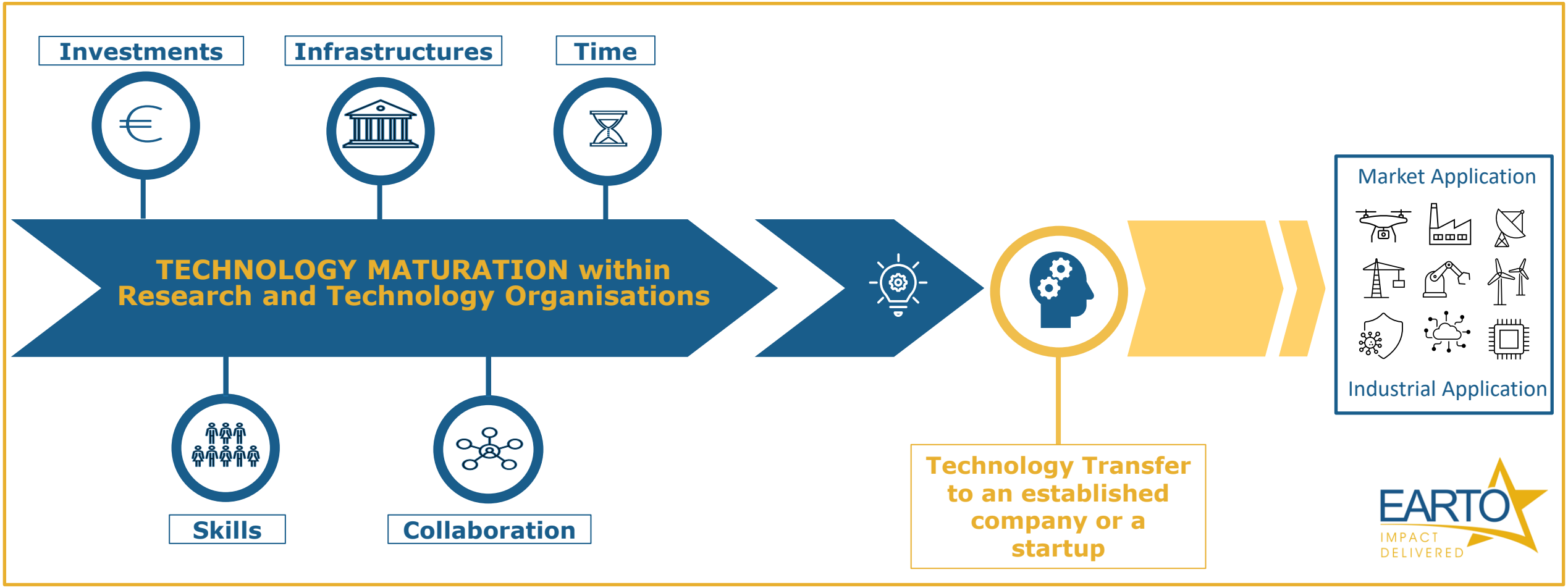
RD&I collaboration between Research Player(s) and an Established Company

The company relies on RTO(s) capabilities to accelerate the maturation of its technology, enabling it to achieve **key milestones**, **stay ahead of competitors**, or accelerate **market entry.**



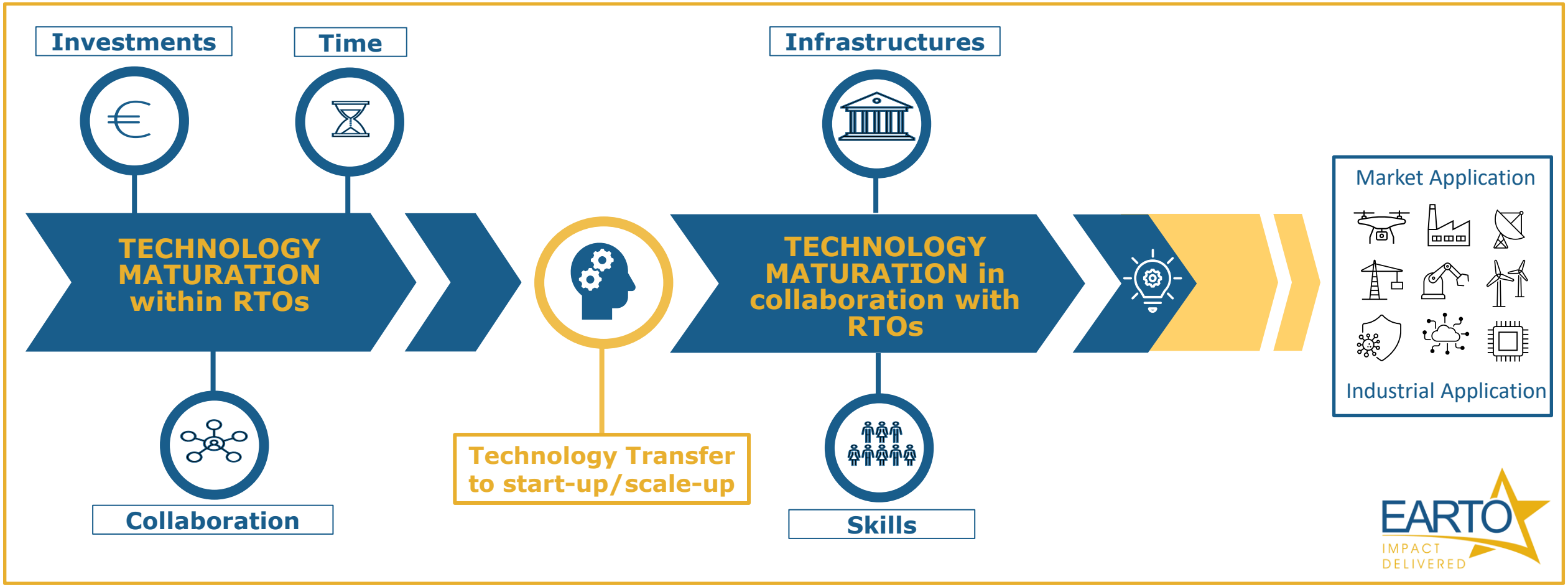
RD&I Collaboration Among Research Players to Nurture a Technology, Which is then Taken by an Established Company or a Start-up

The **Technology Maturation** is taking place within the RTO before the **Technology Transfer occurs** to an established Company/Start-up or to a Spin-off/Start-up of the RTO.

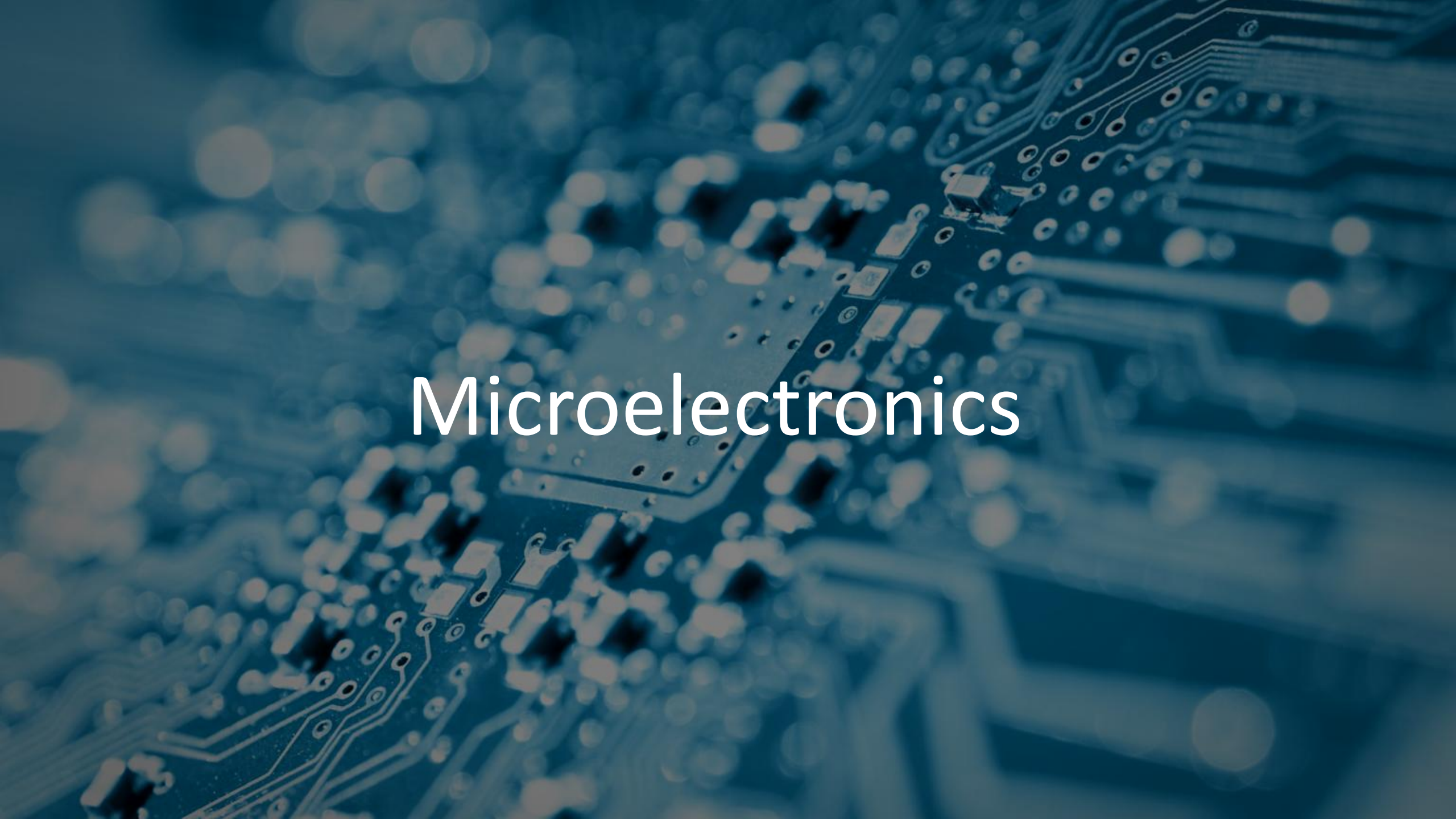


RD&I Collaboration between Research Player(s) and a Start-up/Scale-up

Once created, the Start-up/Scale-up **still rely on RTO(s)** capabilities to further develop its technology and finally **bring it to market.**



RTOs' success stories


Microelectronics

CEA-Soitec Collaboration: Shaping the Future of Microelectronics

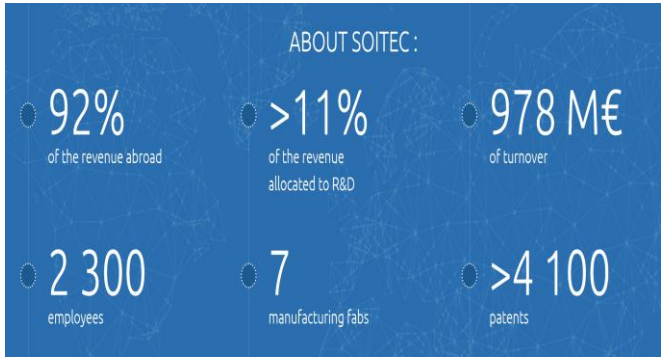
A Revolution in Chip Manufacturing: **Soitec's patented SmartCut technology cuts wafer emissions by 70% while boosting performance**

RTO – Industry Collaboration: Soitec and CEA-Leti's 30-year partnership enabled a **4-year fast-development process for this new factory**

A Technology for the Future: This SiC-based technology enhances energy efficiency, thermal management, and power density, reducing material waste. For example, **it could extend electric vehicle range to over 500 km, up from 350 km**

"The complementarity of our two organisations was the key to this success. Setting up a full pilot line within our clean rooms was a new stepping stone in our long-term partnership with Soitec, and the results are excellent. By joining forces to work simultaneously on fundamental understandings and practical implementation, ***we've bolstered our organisations' ability to support European leadership in this field."***

Sébastien Dauvé, CEA-Leti's CEO



From CEA Spin-off to Global Industry Leader

Founded in 1992 by four researchers from the CEA eager to leverage Smart Cut™ technology for industrial-scale production of silicon-on-insulator (SOI) wafers, Soitec is one of the first spin-off startups from CEA-Leti. Soitec is now a world leader in semiconductor materials and has been a listed company on Euronext Paris since 1999

An RTO – Industry Collaboration

To Bring a New Technology to the Market

Contributing to the Creation of a New Factory

Located in Bernin (France), Soitec announced 380 M€ investment, with 400 new jobs within 5 years

CEA-Soitec Collaboration: From Lab to Fab

EARTO IMPACT DELIVERED

4 Years

2020 — Soitec Lab & Pilot line

The Soitec Lab aims to develop with CEA-Leti **process and prototyping activities,** reinforced by a **pilot line** financed with **industrial partner,** Applied Materials and **institutional funding** from the EU & Auvergne Rhône-Alpes Region

2021 — Tech Development strengthen by collaborative projects

- Transform, **European project with a large consortium** (33 partners, 7 countries) including Soitec, CEA, Fraunhofer, etc.
- Mobi-SiC, national project involving 6 industrial and 2 academic partners

2022 — Tech advancements

Key milestones reached such as:

- The physical understanding and improved reliability of the technology (smart bonding)
- Validation of the 1st power components in-house at CEA-Leti

2021 — EARTO Innovation award

The CEA received the **EARTO Innovation award in the Impact Delivered category** for the development of a patented Smart Cut™ process of substrate fabrication in collaboration with SOITEC

2022 — Validation

Joint announcement of **Soitec and CEA-Leti of the 1st 200 mm SiC subtrates through smart bonding** at the Conference on Silicon Carbide and Related Materials (ICSCRM 2022) in Davos, Switzerland, and press papers

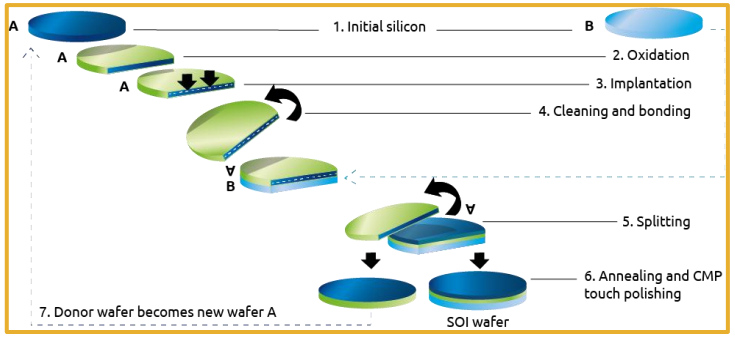
2023 — Inauguration & Production

Inauguration of the Bernin SmartSiC Factory dedicated to SmartSiC substrates. Support from the CEA-Leti R&D teams to fully qualify the first production runs

TELECOMMUNICATIONS

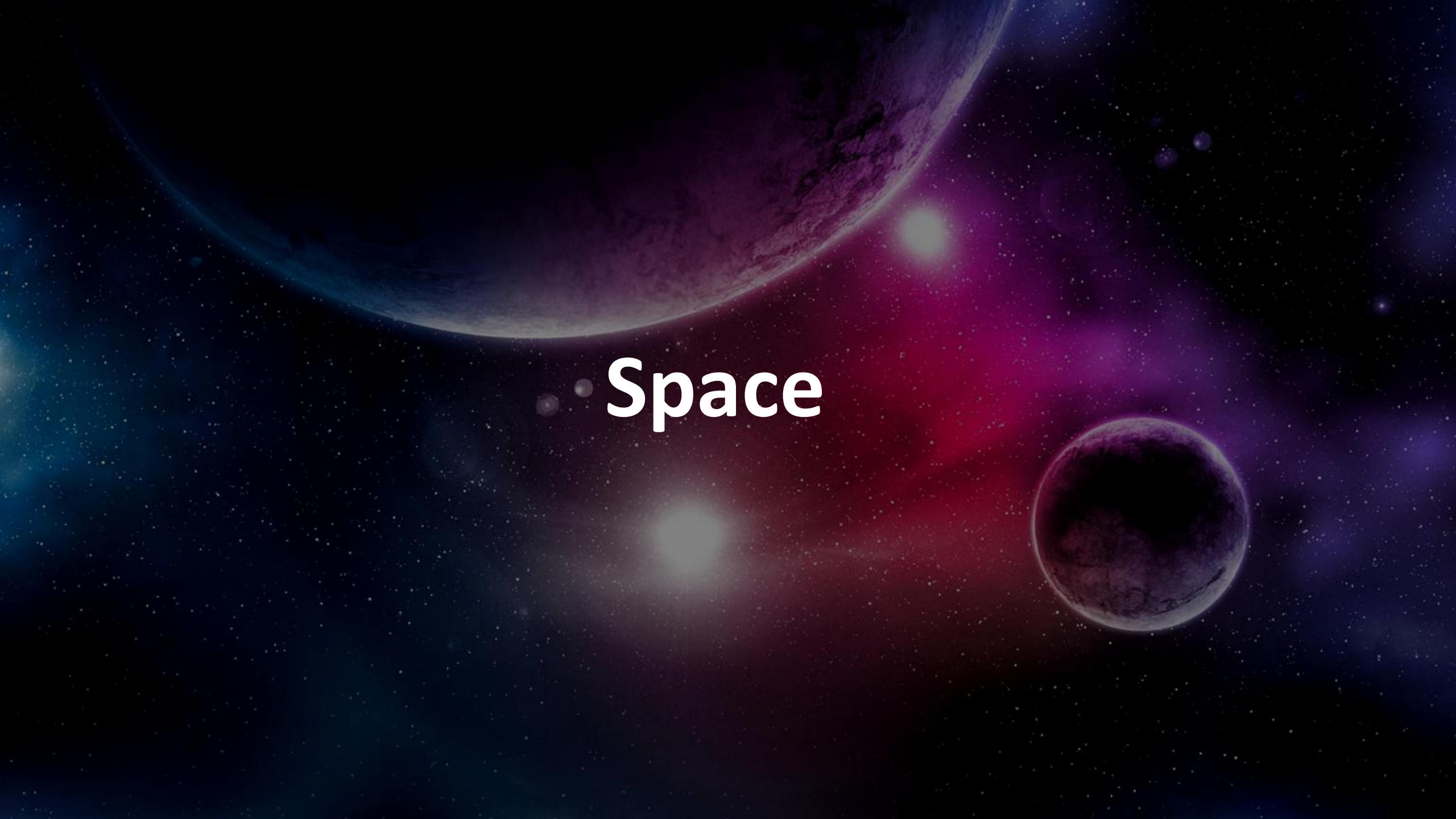
INDUSTRY

ELECTRIC VEHICLES



It only took four years to go from lab to fab. In 2019, we decided on a SmartSiC solution. In 2020, we brought out our first 150-mm wafers, thanks to CEA-Leti. In 2021, we were able to build our pilot line at CEA-Leti. In 2022, we qualified our 200-mm wafers. And today, we are inaugurating the Bernin 4 fab.

Sandrine Chabanet, director for innovation at Soitec, quoted by EETimes Europe, November 20 2023


Space

constellr: A Fraunhofer Spin-off Monitoring Earth's Resources from Space

One Vision: **A constellation of small satellites** continuously monitoring the surface temperature of our planet with high resolution. **The data can be used to analyse water levels, urban heat islands, infrastructures and forest fires**

One Innovation: The High-Precision Versatile Ecosphere (HiVE) delivers 30m-resolution surface temperature data in near real-time, transforming **how industries monitor and respond to Earth's changing surface**

Towards a Sustainable Future: **Preparedness for agriculture that is resilient to the challenges of climate change and population growth.** According to the United Nations, humanity will need 50% more food by 2050 to sustain 10 billion people, while food security is already threatened by droughts, water scarcity, floods, and environmental challenges

From a Bus to a Fridge

Traditional satellites for monitoring Earth's surface temperature are massive and cost over €1 billion per mission, while constellr's microsatellites, no larger than a fridge, deliver the same capabilities for less than 1% of the costs

EARTO IMPACT DELIVERED

Fraunhofer EMI

A Fraunhofer spin-off

constellr

European leader in satellite technology & data services

constellr: From Idea to Orbit

EARTO
IMPACT DELIVERED

10 Years

2017

European Space Agency (ESA) prize

Fraunhofer EMI scientists Max Gulde and Marius Bierdel won third place in an ESA competition for satellite-supported efficient irrigation systems

2018

Fraunhofer-Gesellschaft's Accelerator programs

Within the **Fraunhofer Accelerator,** Christian Mittermaier, complemented the science-based founding team with his business background

2020

Launch of the start-up, constellr

€2 million was raised to launch constellr through the support from Fraunhofer AHEAD program and German Ministry's EXIST funding

2022

launch of Microsatellites

constellr's first thermal infrared Earth observation system **was launched aboard the ISS.** The telescope was developed in **collaboration with Fraunhofer**

2023

constellr Expands its Market Presence

constellr secures a multi-million, multi-year data contract from the EC and ESA under the **Copernicus Programme** and expands into **North America,** closing a €17M seed round after strong growth in **Europe and Brazil**

2025 – 2028

1st launch into orbit

On 15 January 2025, **constellr launched its first thermal infrared satellite, 'SkyBee-1,'**. Another launch is set for 2025 and more planned from 2026

EU & Worldwide Market Expansion

"We wanted to use our Fraunhofer technology to help solve a global problem. However, the world of entrepreneurship was rather abstract for us and not part of our life plan. […] Rather by chance, we got into conversation with an employee of Fraunhofer Venture."

Dr. Max Gulde, CEO of constellr

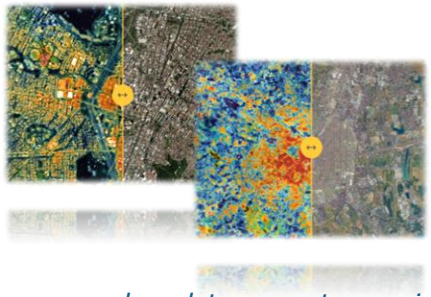
The RTO Fraunhofer was the place where:

- **The idea was conceived and developed into concept**
- **The technology was matured for a successful spin-out**
- **The start-up was created and accompanied**
- **The collaboration continued for Tech Development**

constellr Technology's Impact on Earth

Urban Climate Resilience

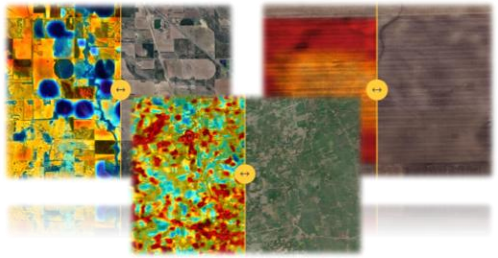
Urban Heat Islands & Mitigation Measures



As cities expand and temperatures rise, thermal intelligence helps pinpoint urban heat hotspots, while urban mitigation measures reduce heat island effects, improve air quality, and enhance biodiversity

Agriculture

Crop Stress, Soil Temperature, Biomass & Yield Monitoring



Thermal data enables early detection of crop stress, optimized soil temperature assessments for planting, and advanced biomass and yield monitoring, providing farmers and industry stakeholders a market edge by identifying yield risks up to two weeks earlier than current tools

Resilient Infrastructures

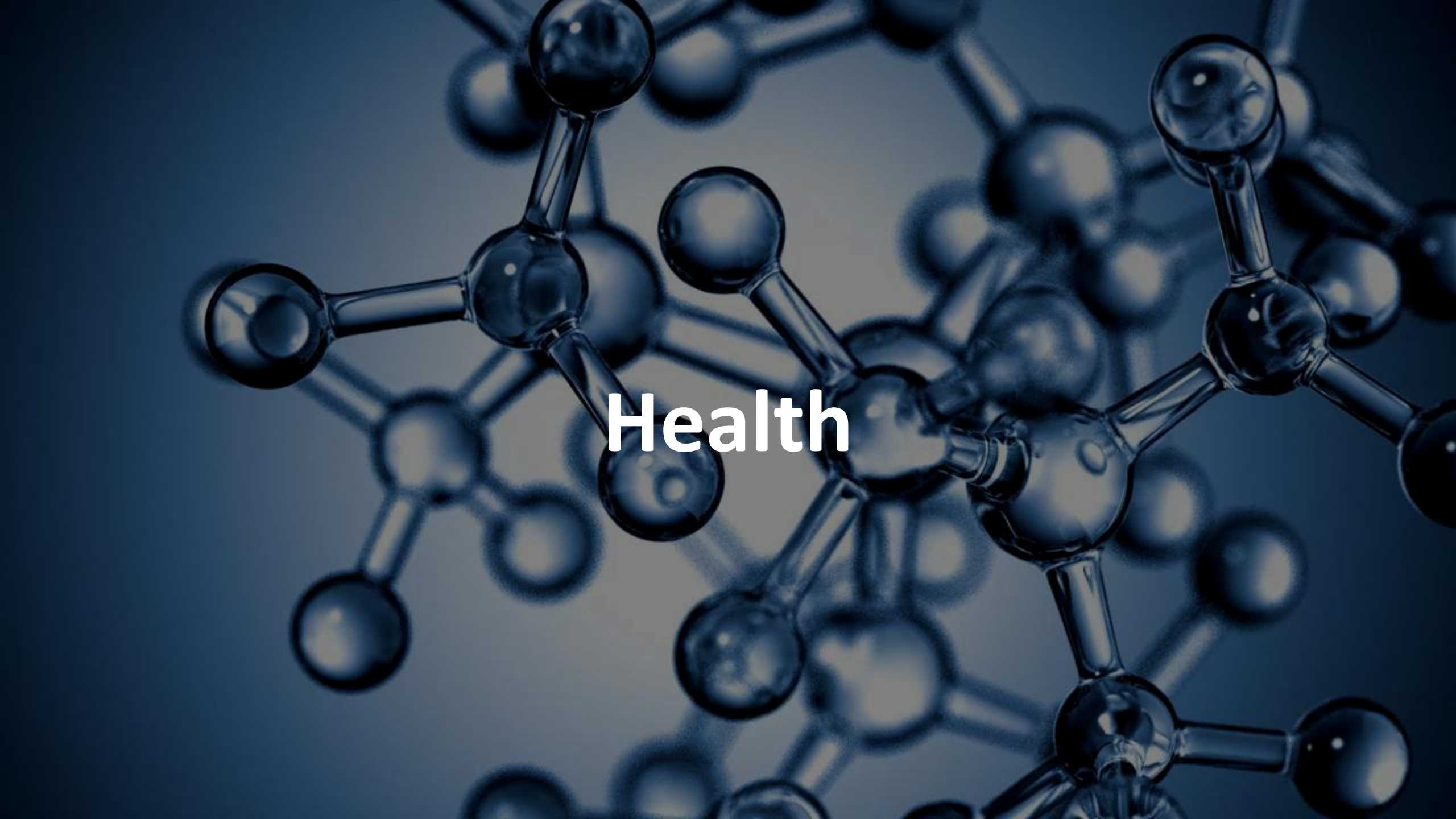
Monitoring road network temperatures, energy infrastructure, and industrial sites

Enabling efficient detection of temperature extremes, thermal anomalies, and inefficiencies, optimizing maintenance, preventing damage, and reducing structural risks across critical systems

From 2026, **180 billion tons of water and 94 million tons of CO_2 could be saved annually**, while the global crop yield could increase by up to 4% without higher water consumption. This would be enough food for over **350 million people**

30+ Public organisations & Industrial partners supporting constellr: European Space Agency, US Department of Agriculture, OHB, BAYER, terraPulse, Copernicus, etc.

5 Sustainable Development Goals supported


Health

Automated Optical Blood Pressure Monitoring
One CSEM Technology, Two Innovative Start-ups

One Societal Challenge: **The World Health Organisation estimates that 1.28 billion people aged 30 to 79 suffer from hypertension**, costing global healthcare systems $370 billion US annually

One Innovation: **An automated Optical Blood Pressure Monitoring Technology** to improve hypertension treatment

AKTiiA

A cuffless optical blood pressure monitor integrated into a bracelet and supported by an app, which provides 24/7 readings for continuous tracking and easy consultation, helping millions at risk from untreated hypertension

*"After 15 years in development, at CSEM the prestigious Swiss Research & Development Center, and almost two million blood pressure readings, Aktiia has cracked the code to bring to market **the world's first automated 24/7 blood pressure monitoring system."***

Mattia Bertschi, Aktiia's COO

Two Start-ups

"The blood pressure measurement hadn't changed in over a century"

biospectal

OptiBP™, **a CE-approved app** to measure blood pressure via smartphone using a **fingertip on the camera**, making it the **world's first clinically certified blood pressure monitor app**

*"CSEM has experience working with the watchmaking industry and is a world-leading expert in oscillator systems. **That's where you go when you are seeking technologies that break the mold."***

Prof. Patrick Schoettker, CMO, Biospectal

csem

A CSEM Technology

Two Start-ups created

3 GOOD HEALTH AND WELL-BEING

Sustainable Development Goal *3*

Ensure healthy lives and promote well-being for all at all ages

Automated Optical Blood Pressure Monitoring
One CSEM Technology, Two Innovative Start-ups

EARTO IMPACT DELIVERED

20 Years

2004 - 2011 — Research & Development

CSEM initiated research on non-invasive Photoplethysmography (PPG) for **continuous blood pressure monitoring:**

- 2004–2007: Developed the first multi-vital optical blood pressure approach (MiniNOB)
- 2007–2011: Focused on pulse wave velocity (PWV)

2011 - 2017 — Technological Advancements

Development of **PPG techniques to analyze arterial diameter changes per heartbeat**, leading to Optical Blood Pressure Monitoring (oBPM) via pulse wave analysis (PWA) after testing a dozen techniques

2017 — Technology Transfer & Startup Launches

2017: Launch of Biospectal.
2018: Launch of Aktiia.

2020: CSEM and AKTIIA technology won an **EARTO Innovation Award 2020 prize** in the Impact Delivered Category

2017 - 2018 — Regulatory Requirements Validation

CSEM ensures its solutions meet the **highest medical standards**, complying with ISO-13485 (quality management) and ISO 81060-2 (accuracy)

2018 - 2023 — Industrial Development

Aktiia received regulatory approval for CALFREE™, a calibration-free optical technology using sensors in smartwatches or smartphone cameras. It received approval for **sales in over 40 countries**

Biospectal launched the public beta of OptiBP™ for Android in February 2024

2024 — Clinical Validation & EU Market Introduction

2018–2020 Clinical Studies: Aktiia's oBPM™ system validated in Blood Pressure Monitoring

Regulatory Approvals:

- Aktiia received CE mark approval for European market access
- Biospectal's OptiBP™ obtained certification for optical fingertip BP

EU & Worldwide Market Expansion

"The development of optical blood pressure monitoring started about 20 years ago at CSEM, and in 2001, we developed and patented our first solution and algorithm for optical heart rate measurement."

Jens Krauss, VP Medtech, CSEM

The RTO CSEM was the place where:

- **The Research and Development took place to mature the technology (2004 – 2017)**
- **Two start-ups were created as a result of one RD&I activity**

Automated Optical Blood Pressure Monitoring
One CSEM Technology, Two Innovative Start-ups

AKTiiA An Established Company

>300M

More than **300 Million Blood Pressure measurements to date**, the largest blood pressure data set in the world

>80K

More than **80 000 patients currently rely on Aktiia** for Blood pressure management and optimisation

35

The World's First Clinically Validated Optical Blood Pressure Technology (20+ clinical trials), **backed by over 35 patents**

Aktiia employs around 60 people, and the continued expansion of its technology is expected to stabilise and potentially increase employment opportunities

biospectal A Thriving Start-up

>851M

The global market size for disposable blood pressure cuffs was estimated at around **$269 million in 2022 and will reach $851 million by 2032**

Several **collaborations with industrial partners** such as connectedlife, FibriCheck, Thryve & Supported by **grants** from the Bill & Melinda Gates Foundation, Grand Challenges Canada and Innosuisse


Forbes

FORBES > INNOVATION > CONSUMER TECH

Here's How Biosensing Software Is Helping People Measure Heart Health

Market Expansion: The Biospectal OptiBP for Android public beta is available now in the US, UK, France, Germany, Spain and Switzerland

Energy

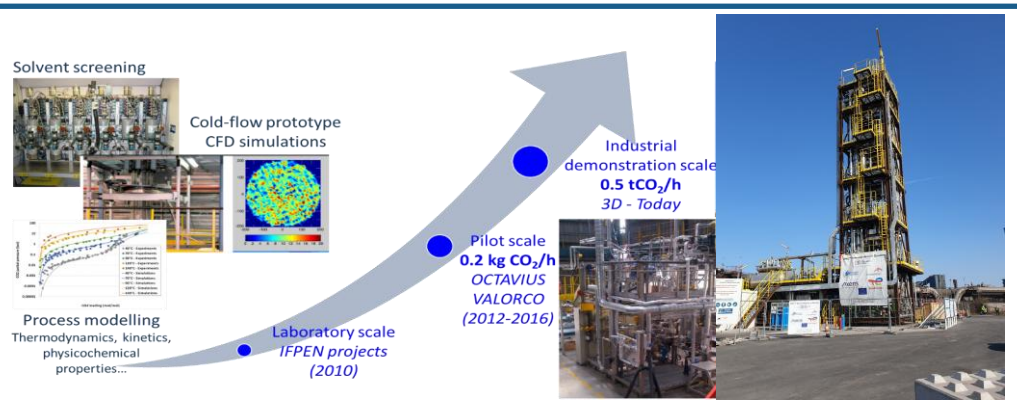
IFPEN's DMX™ technology: Decarbonisation of CO_2-Intensive Industries

<u>The DMX™ Technology</u>: An advanced post-combustion carbon capture process developed by IFPEN and commercialised by Axens to significantly reduce CO_2 emissions from industrial sources

<u>RTO – Industry collaboration:</u> From **lab-scale development** to a successful **industrial demonstration** at ArcelorMittal's steel mill in Dunkirk, the world's leading steel and mining company. The **DMX™ process is ready to be commercialized in 2025**

<u>Towards a Sustainable Industry:</u> CO_2 capture and storage (CCS) technologies are identified by the EU as crucial to achieve COP21 objectives. According to the IEA, CCS technologies are set to account for 9% of the CO_2 emission reductions required by 2050 in order to reduce global warming to 2°C by 2100

This technology works by absorbing CO_2 from flue gas using an innovative demixing solvent. *This solvent's unique properties, combined with smart process integration, result in* ***minimal energy consumption***. *Additionally, the DMX solvent has excellent resistance to degradation,* ***reducing maintenance and operating costs over time***. *The process produces highly pure CO2 (>99.9%), which can be used for either* ***permanent storage or other industrial applications***



IFPEN Technology

EU RD&I Collaborative Projects & Industrial Partnerships

Technology Transferred to Axens to support the decarbonisation of CO_2-intensive industries

Axens
Powering integrated solutions

IFPEN's DMX™ technology: From Lab to Fab

EARTO IMPACT DELIVERED

15 Years of Tech Maturation

2010

lab-scale experiments

The DMX technology developed by IFPEN is an **advanced post-combustion carbon capture** process aimed at reducing industrial CO2 emissions

2012 - 2017

EU RD&I Collaborative Project

The OCTAVIUS project, coordinated by IFPEN and gathering 16 participants, aimed to demonstrate integrated concepts for zero-emission power plants

2014 - 2018

National collaborative Project

The VALORCO project, coordinated by Arcelor Mittal, aimed to **reduce the steel industry's carbon footprint** by minimising and utilising CO_2 emissions

2020

EU Demonstration Project in Collaboration with Industry

The "3D" (DMX Demonstration in Dunkirk) H2020 EU project (€14.8 million) developed a large-scale industrial demonstration at ArcelorMittal's steel mill in Dunkirk (0.5 tCO2/h)

2024

1st Industrial Unit

The 3D project also prepared the future construction of a **larger industrial unit capable of capturing 1 million tons of CO2 annually by 2028 (125 tCO2/hour)**

2025

Market Deployment by Axens

The DMX technology is commercialised by Axens and is now ready for market deployment, targeting primarily hard-to-abate industrial emissions

EU & Worldwide Market Expansion

"After 15 years of development of this innovative technology at IFPEN from proof of concept through to the laboratory, we're proud to have demonstrated the performance of the DMX™ process for an industrial gas flow. It's all thanks to intensive teamwork, conducted with our partners since the launch of the 3D project back in May 2019. And it represents an important step towards the decarbonisation of industry in France and around the world."

Vania Santos-Moreau, 3D project manager

Sustainable Development

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

DMX™ technology could potentially **prevent 20 million tons of CO_2 emissions annually** through 30 DMX™ licenses by 2035

Energy

H2SITE: Enabling Hydrogen Generation and Transportation

An innovative spin-off: H2SITE builds on its **membrane reactor and separation technologies** developed by **Tecnalia** and the **Eindhoven University of Technology (TU/e)** to generate hydrogen from transportable molecules such as ammonia, methanol, and syngas, while also purifying hydrogen mixed with other gases in existing pipelines or other storage infrastructures

The collaboration: The membrane reactor technology was developed through several EU projects and internal investments, **over the span of ten years**. TECNALIA joined forces with the TU/e to **develop and scale-up this technology**, combining Tecnalia's membrane technology with TU/e's membrane reactors

Net-Zero targets will require large volumes of low-carbon hydrogen to decarbonize hard to abate industrial sectors, heavy duty mobility, and other potential new usages to be developed. However, the lack of efficient long-distance transport solutions is a major challenge, with existing technologies adding up to 80-300% to the cost of producing hydrogen. **Carriers like ammonia or methanol represent promising options for transport** given their well-established manufacturing process, supply chain and regulatory framework, while offering higher energy densities and simpler storage requirements compared to liquid hydrogen

H2SITE's technology *is based on palladium-alloy membranes that are only selective to hydrogen that guarantees 99.97 % purity levels suitable for use in fuel-cell or industry*

These membranes are integrated in advanced reactors and separators solutions that ***recover up to 98 % of the hydrogen*** *to offer high efficiency*

MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

EINDHOVEN UNIVERSITY OF TECHNOLOGY

Pd-based membranes and Membrane Reactor Technology

EU RD&I Collaborative Projects & Industrial Partnerships

Technology transfer to H2SITE for hydrogen production and purification

H2SITE: Tecnalia - TU/e Innovation

EARTO IMPACT DELIVERED

2009 - 2018

R&D Technology - 10 years

The membrane reactor technology was developed through several EU projects and internal investments. **TECNALIA joined forces with the Eindhoven University of Technology (TU/e)** to make progress in this technology

2019 - 2020

Business Plan, Investors, H2SITE creation and Seed Series

In 2019, collaboration with Engie New Ventures with several joint EU projects. Based on these opportunities, **the spin-off H2SITE was created**

In 2020, the Seed Series was accomplished with the objective to build membrane production facilities and start industrialization of integrated membrane reactors and separators

2021 - 2022

Early growth & Series A

Product-market fit was prioritized:

- converting carriers into pure hydrogen for industry applications
- Separating pure hydrogen from gas blends for natural hydrogen and hydrogen storage

Second funding round to combine industrial and cleantech financial investors, resulting in **€12.5 million raised in 2022**

2023

Manufacturing plant & 1st successful project

In 2023, the Tyseley Ammonia to Green Hydrogen Project was launched, aiming to **develop the world's largest and most efficient ammonia-to-hydrogen conversion unit**, capable of producing 200 kg of transport-grade hydrogen per day.

H2SITE continued industrializing the technology

2024

Thousands of membranes production & Series B

H2SITE successfully executed projects (R&D and commercial) in many countries. Some of these solutions are **unique in the world as the world's first ammonia onboard cracker in Bilbao**

In 2024, H2SITE **raised €36M Series B** (one of most important Series B in Spanish Deep tech companies)

2025

Project scaling

In 2025, H2SITE will scale up its membrane reactor technology to achieve a hydrogen production capacity of **several tons per day by 2026**. With 10 projects already operational across Western Europe and expansion plans underway in North America, the EU, and the Asia-Pacific region, **H2SITE is positioning itself as a leader in the global transition to a low-carbon hydrogen economy**

5 years of huge advance to lead hydrogen economy

From 10 Tn/day of Hydrogen to 100 Tn/day

"Transporting hydrogen is hard. We won't be able to talk about hydrogen economy unless we sort the transportation problem".

"Our strategic and financial partners bring deep expertise in scaling hydrogen production and understanding market demand. Together, we're ready to accelerate large-scale infrastructure projects focused on ammonia cracking and hydrogen separation over the next 36 months."

Andrés Galnares, CEO of H2site (December 2024)

Enabling Hydrogen Transportation for a Sustainable Future

The most advanced technology to make high-purity hydrogen available

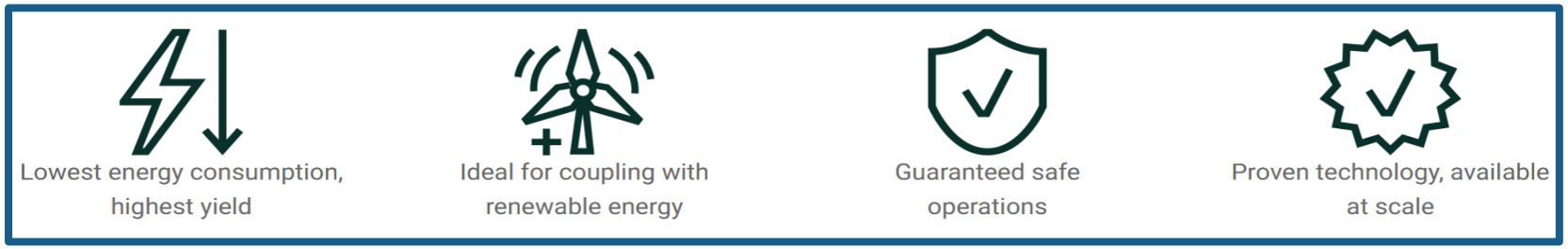
Green Hydrogen Production

ZIRFON: Agfa-VITO Innovation
Enabling Large-Scale Green Hydrogen Production

A breakthrough technology for green hydrogen production: ZIRFON membranes, developed by Agfa and VITO, enhance the efficiency of **alkaline water electrolysis**, a key process in **green hydrogen production**. This innovation enables large-scale hydrogen generation while significantly reducing CO_2 emissions.

RTO knowledge transfer into the market: Agfa and VITO have strategically collaborated to scale up ZIRFON membrane production. With support from the **EU Innovation Fund**, Agfa is establishing an **industrial-scale facility** to meet the growing demand for hydrogen electrolysis membranes.

An advanced manufacturing technology: This new facility will produce membranes for up to **20 GW of water electrolysis annually**, contributing to a projected reduction of **15 million tonnes of CO_2 emissions**. This advancement strengthens European competitiveness, accelerates the green hydrogen economy, and supports the EU's carbon-neutral mission.



While a membrane is just a small component of an alkaline electrolyser, ZIRFON has a transformative impact on the overall system performance. Through its engineered characteristics, ZIRFON guarantees peak performance at the lowest hydrogen production cost.

AGFA

vito

A VITO Technology Advanced through Strategic Collaboration

Scaling Up with Support from the EU Innovation Fund

Driving the Green Hydrogen Economy with Industrial Impact

ZIRFON

ZIRFON: Agfa-VITO Innovation

EARTO
IMPACT DELIVERED

18 Years

2007 — Idea Start

Initial collaboration between Agfa and VITO leads to the commercial launch of **ZIRFON membranes** for **alkaline water electrolysis**.

2009 — A License Agreement

2009: Agfa and VITO sign a **license agreement** for the production and commercialisation of ZIRFON membranes.

2023 — Scaling up with EU Support

Co-funded by the European Union

2023: Renewal of the license agreement and **€11M EU Innovation Fund grant** awarded to Agfa for **industrial-scale production** in Mortsel, Belgium.

2023 - 2025 — Advanced collaboration

Ongoing: VITO continues R&D with Agfa to develop **novel porous gas separator membranes**, further improving electrolyser performance.

October 2025 — Industrial impact

By October 2025: The ZIRFON production plant will be operational, producing membranes for **20 GW of electrolysis annually**.

Accelerating the Green Hydrogen Transition

"Hydrogen plays an important role in the transition towards cleaner and more sustainable energy sources. We are developing materials that enable safe and cost-effective production of hydrogen. Agfa is a partner with a proven track record to bring these new materials successfully to the market. We are looking forward to the continued collaboration."

Inge Neven, CEO at VITO


Packaging & Forestry

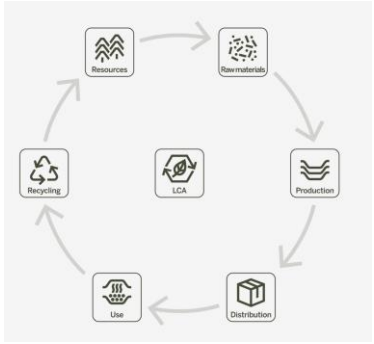
Novel 3D Wood Fibre Products with VTT expert support: A Sustainable Alternative to Plastic

An alternative to plastic: A novel **3D wood fibre product that replaces traditional plastic**. It can be used in a wide range of applications, **from takeaway to industrial packing**

The collaboration: **Valmet**, a leading provider of process technologies, automation, and services for the pulp, paper, energy, and process industries, has joined forces with **Metsä Group**, a forest industry company, and its innovation-focused subsidiary, **Metsä Spring**. Together with the support of VTT, they accelerated the design and validation of a new production line and process, collaborating to develop the Muoto® packaging solution

Towards green transition: Novel 3D fibre products present a disruptive and sustainable solution that offers **a biodegradable alternative for the world's packaging needs**

Demo 3D fibre production line created as part of the project



This collaboration has already brought Muoto® to market, addressing plastic packaging challenges. However, the technology and expertise behind this partnership have the potential to drive the development of multiple new products and transform the global packaging industry

VTT

Metsä

Valmet FORWARD

An RTO – Industry Collaboration

For an alternative to plastic called Muoto®

Muoto®

Novel 3D Wood Fibre Products with VTT expert support: A Sustainable Alternative to Plastic

EARTO IMPACT DELIVERED

4 Years

2020 — Start of the collaboration

Metsä Group and Valmet collaborate around the development of **a novel 3D fibre-based material**

2021 — RTO expertise-driven R&D

Collaboration with VTT was key in **designing the industrial process, offering access to specialised equipment and testing facilities**. Their expertise in fiber suspensions and industrial processing helped speed up development

2022 — From Lab to Demonstration

The first phase involved lab research, progressing to the construction of **a pilot-scale machine and culminating in the launch of a demo plant** in May 2022

2022 — First commercial exploitation

Building on the success of the demo line, Valmet and VTT continue their collaboration to **mature the technology and explore its commercial potential and potential scaling up for broader market applications**

2024 — Tech Development continues for broader applications

In 2024, VTT launches a new initiative to **advance low-carbon technology for sustainable fiber-based products**. It includes multiple projects and an **open-access pilot line** in Jyväskylä, Finland, which will enable continued research and innovation in fibre product manufacturing

EU & Worldwide Market Expansion

3-Dimensional Impact

1. **A game-changing, natural, and sustainable solution** that directly combats climate change and the global plastic crisis. This breakthrough alternative to plastics and aluminum revolutionizes food packaging and beyond
2. **High-speed innovation meets efficiency:** The cutting-edge, automated production line leverages continuously evolving technology, slashing water consumption by up to 90% and cutting overall energy use by more than half
3. **Reduced time to market** with agile piloting and validated design choices

> VTT's experienced researchers and their strong expertise on piloting were essential in reaching our targets. There was no need for an extensive trial-and-error period during development, which expedited the whole development process.
>
> *Sampo Immonen, Head of Line R&D at Valmet*

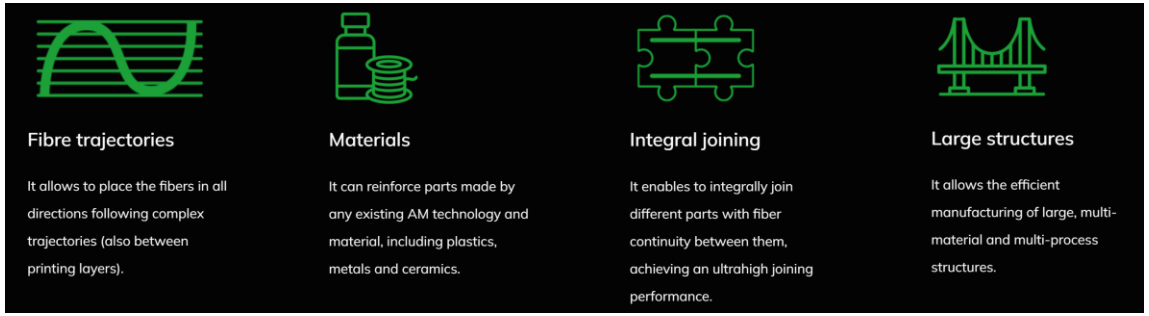
Additive Manufacturing

Reinforce3D: Eurecat spin-off
Enhancing the Performance of 3D-Printed Materials

First technology based on reinforcing the part after the Additive Manufacturing: Reinforce3D is a start-up aimed to further develop and commercialise the **Continuous Fiber Injection Process (CFIP) Technology.** CFIP is a new post-process technology which drastically improves the mechanical and lightweighting performance of 3D printed parts by reinforcing them with continuous fibers

RTO knowledge transfer into the market: Born from a partnership with BeAble Innvierte Kets Fund (BIKF), Eurecat and Marc Crescenti (researcher previously working at Eurecat). This technology has been jointly developed for **commercialisation through a newly created spin-off**

An Advanced Manufacturing technology: This advancement contributes to **reducing CO_2 emissions**, fuel and electricity costs. It also increases the **European competitiveness and productivity**, while reducing the manufacturing costs



eurecat

BeAble CAPITAL
Science Equity for Tomorrow's Industry

An Eurecat Technology Nurture by Collaborative Projects

Beneficiating from a Partnership with an Investment Firm

Leading to a New Industrial Spin-off

REINFORCE 3D

Reinforce3D: Eurecat spin-off

EARTO IMPACT DELIVERED

2014 — Idea Start

Idea (TRL 1-3): Proof of concept development by Eurecat

2015 — Collaboration advancements

- **Projects with HP and Asics**
- Internal Research projects PRIV and TRAÇA
- Eurecat adopts the **CFIP Technology** developed initially by a researcher working at the centre

2017 — Two patent applications

- **2015:** IP protection for the Technology and Method submitted
- **2017:** 2nd patent Shared with Airbus Research to Industry3D Congress

2019 — Technology presentation & recognition

Presentation at **Industry3D Exhibition** and awarded at **JEC World**.

IN(3D)USTRY FROM NEEDS TO SOLUTIONS Best Solution in Advanced Materials

JEC INNOVATION AWARDS WINNER

2021 — Spin-off creation

October 2021 LOI signed with **investor BeAble** to constitute a spin-off to exploit CFIP technology

BeAble CAPITAL

In December 2021 **Eurecat Board approves the constitution of Reinforce 3D S.L.**

REINFORCE 3D

2024 — Market Deployment

- First service contracts signed
- Machine development continues
- **First Machines sales end of 2024**

10 Years

EU & Worldwide Market Expansion

"This technology makes it possible to address some of the mechanical performance, dimensions and part type limitations that additive manufacturing has currently."

Marc Crescenti, CTO and partner at Reinforce3D and the architect of the technology in his role as a researcher at Eurecat


Offshore Industries
&
Environmental Actions

Long-endurance unmanned surface vessel (USV)

The technology: The **SailBuoy** is an **Unmanned Vessel (USV)** that complements research vessels, gathering oceanographic and meteorological data in an eco-friendly manner, using wind power for propulsion. The Sailbuoy can be used for a **wide variety of ocean applications**: From measuring ocean and atmospheric parameters to tracking oil spills or acting as a communication relay station for subsea instrumentation.

The collaboration: **Offshore sensing AS** was established as a spin-off from the former Christian Michelsen Research (now NORCE).

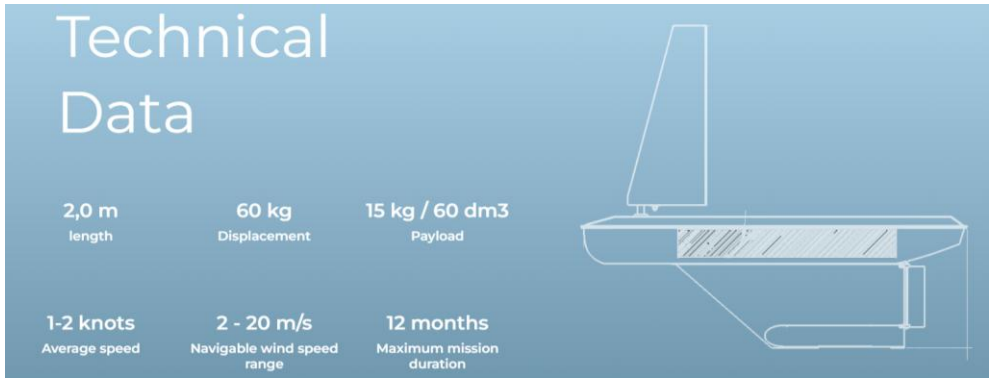
Towards green transition: The SailBuoy is **100% emission free**, using wind power for propulsion and solar power for the electronics and actuators. In addition, Sailbuoy can be deployed in high-risk environments, such as during severe storms, in polar regions, or in areas affected by toxic spills, without the need for human presence. This **significantly reduces the risk of injury or fatalities** associated with manned missions.

100% **emission free**

Significantly **reduces human risk**

Autonomous ocean navigation

Collects data at a fraction of the **cost** compared to traditional methods.



1st Atlantic crossing by an unmanned surface vehicle

Joint work between research players to nurture a technology

Leading to a spin-off creation

Long-endurance unmanned surface vessel (USV)

EARTO IMPACT DELIVERED

Key upgrades & milestone

Successful Missions

Successful **missions and sea trials** to assess navigational accuracy, to acquire different types of data, to assess performance in varying wind/current conditions, for ice edge control, among others

Offshore Sensing introduced **key technological upgrades** to the SAILBUOY, including more advanced sensors, improved data transmission systems, and enhanced autonomous capabilities.

SAILBUOY achieved global deployment, conducting successful missions in various regions, including extreme environments like the Arctic and deep ocean zones. Its long-term monitoring capabilities were widely recognized.

20 Years

2005 — **Sailbuoy technology developed**

2011 - 2018

2014 — **Offshore sensing AS was established**

2020 - 2021

Expansion to market

Offshore Sensing expanded into **new markets**, including **offshore energy, climate research, and shipping**. The eco-friendly and autonomous nature of SAILBUOY made it an attractive solution for companies looking for sustainable maritime operations.

2022 - 2024

EU & Worldwide Market Expansion

The SailBuoy has been used and/or is **currently in use in polar regions, Europe, Australia and the Americas**, and the company plans to expand into commercial areas such as fisheries and offshore wind farms. **Areas** of application for the time being are towards **research, metrological/climate, mapping, surveillance, marine/maritime, fisheries, fish and biomass, offshore wind, and military**.

UN Sustainable Development Goal **14**
Life below water


Textile Manufacturing

Aracne Textile Solutions: Eurecat Partnership with Industry

A precedent in the textile predictive industry: Aracne Textile Solutions introduces an **innovative production method for circular knitting machines**, featuring a quality control system that predicts and/or detects defects and reports them non-intrusively while the machine is running

RTO – Industry collaboration: Born from a partnership between Eurecat and CANMARTEX, this technology has been jointly developed for **commercialisation through a newly created spin-off**

An Industry 4.0 innovation: This advancement contributes to an increasingly sustainable industry, **improving production and reducing costs** at the same time. This system allows **saving water, colourants, gas, electricity, and raw materials**

Textile Industry

3rd

Most polluting industry

20% Global wastewater

10% Global carbon emissions

92M Tones of cloth waste

3$ Trillons of annual waste

"Nowadays, innovation is an obligation; we must innovate, we have no choice. Our clients ask us for different things to continue in this ever-changing market which is more demanding every day."

Enric Marti, CANMARTEX CEO

eurecat

CANMARTEX

An RTO – Industry Collaboration

Leading to Spin-off Creation

ARACNE TEXTILE SOLUTIONS

Aracne Textile Solutions: Eurecat Partnership with Industry

EARTO IMPACT DELIVERED

5 Years

2018 — Idea Start

Start of the Spanish PRECATEX project supported by Catalan for predictive quality control of the fabric.

2020 — Tech Development

TRL4: Characterisation of the knitting inspection yarn by multispectral & development of platen wear sensor for knitting machine

TRL6: Detection of defects in circular knitting needles by optical and photonic inspection

2022 — Collaboration advancements

Co-ownership and joint exploitation agreement for the **4 technological assets**

2023 — 3 Patents applications & Technology presentation

Eurecat innovation presented at ITMA (International Textile Machinery) 2023 in Milan

"[…] helps drive the industry's sustainability, boost production and cut costs while enhancing the innovative positioning of businesses."

Xavier Plantà, director of Eurecat's Industrial Technologies Division

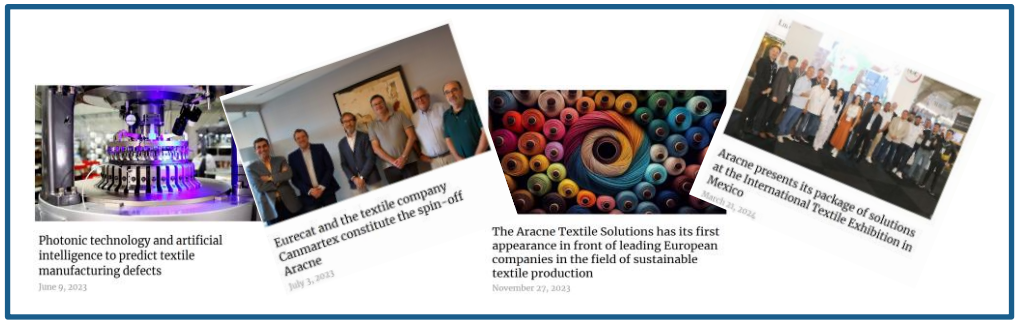
2023 — Spin-off creation

Eurecat and Canmartex founded **the spin-off ARACNE in June 2023** launching the first product modules on the market in the second half of 2023

2024 — 2024 Market Deployment

- A contract signed in Colombia.
- Engaged in commercial activities and fairs in Germany, Portugal, Spain, Mexico, and Peru
- Patent application in Taiwan

EU & Worldwide Market Expansion



4 Sustainable Development Goals supported

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION


Mobility

Tecnalia's FLYFREE technology: Sustainable Urban Air Mobility

FLYFREE technology: An innovative **multirotor aircraft architecture** aimed at a passenger transport service or air taxi to move around cities autonomously

RTO – Industry collaboration: Born from the collaboration between Tecnalia and Crisalion Mobility (former UMILES Next), this groundbreaking air taxi concept, **initially designed and patented by Tecnalia**, is now the proprietary technology that **has positioned Crisalion Mobility as a pioneer in the field of electric air mobility**

Towards new mobility models: Urban air mobility addresses urban congestion and pollution by expanding transport into the vertical dimension. The air taxi market is projected to reach €32 billion by 2035 and $90 billion annually by 2050, revolutionizing urban transport

Flyfree is a technology for electric VTOL urban air taxis based on an over actuated multicopter innovative architecture. It represents Spain's first air taxi and one of the pioneers in Europe

The key innovation lies in *its architecture, which allows the cabin to maintain its own orientation independently of speed*, *a clear advantage over conventional drones and current air taxi applications. This feature improves the flight experience, offering a sensation similar to a car or a bus. From the dynamic point of view CRISALION Mobility recently received an investment of more than €15M*

tecnalia
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

An RTO – Industry Collaboration

FLYFREE
The technology for the next generation of urban mobility

CRISALION MOBILITY

Tecnalia's FLYFREE technology: Sustainable Urban Air Mobility

EARTO IMPACT DELIVERED

2017 — Idea Start

Tecnalia starts to work on **an electric VTOL urban air taxi concepts** supported by Basque Government Programme for Fundamental Research with High Industrial Potential

2018-20 — Tech Development & Partner Search

- Technical feasibility analysis
- **First small-scale prototype**
- European patent application in 2018
- **Search for industrial partner**

2020-23 — Tech Development & EU Projects

3 EU SESAR projects performed by Tecnalia for the validation of the concept in different environments: **Esperce (Toulouse), ATLAS (Jaén), CIAR (Lugo)**

2021 — Tecnalia and UMILES Next agreement in 2021

The agreement reinforces the viability of the architecture and its potential and demonstrates the interest of the market through the **injection of investment capital**

2022-24 — Alliance with an Industry Partner for Tech Development

In partnership with UMILEX Next, tech development of the concept, increasing the attractiveness of capital investment for the achievement of the following steps

2024 — UMILES Next becomes Crisalion Mobility, with an investment of €15M

CRISALION Mobility pioneer in the field of electric mobility, presented at the Dubai Airshow 2023 their new eVTOL vehicle, INTEGRITY, and highlighted their **FlyFree** technology

2025 — Crisalion acquired FLYFREE

CRISALION acquired 100% ownership of the patent and technology from TECNALIA.
Tecnalia also acquired a stake in CRISALION, joining forces with new investors to drive innovation and growth

Market Launch 2032 — Crisalion's road map:

- 2028 - **Unmaned flight 1:1**
- 2031 - **Pilot-on-board testing phase**

Urban air mobility constitutes a new mobility model by expanding the possibility of transport in the third vertical dimension of space. It is based on the concept of mobility through environmentally sustainable propulsion methods and applying the advances made in the transport sector in terms of autonomous driving and flight that forms one of the pillars of innovation in the field of sustainable mobility