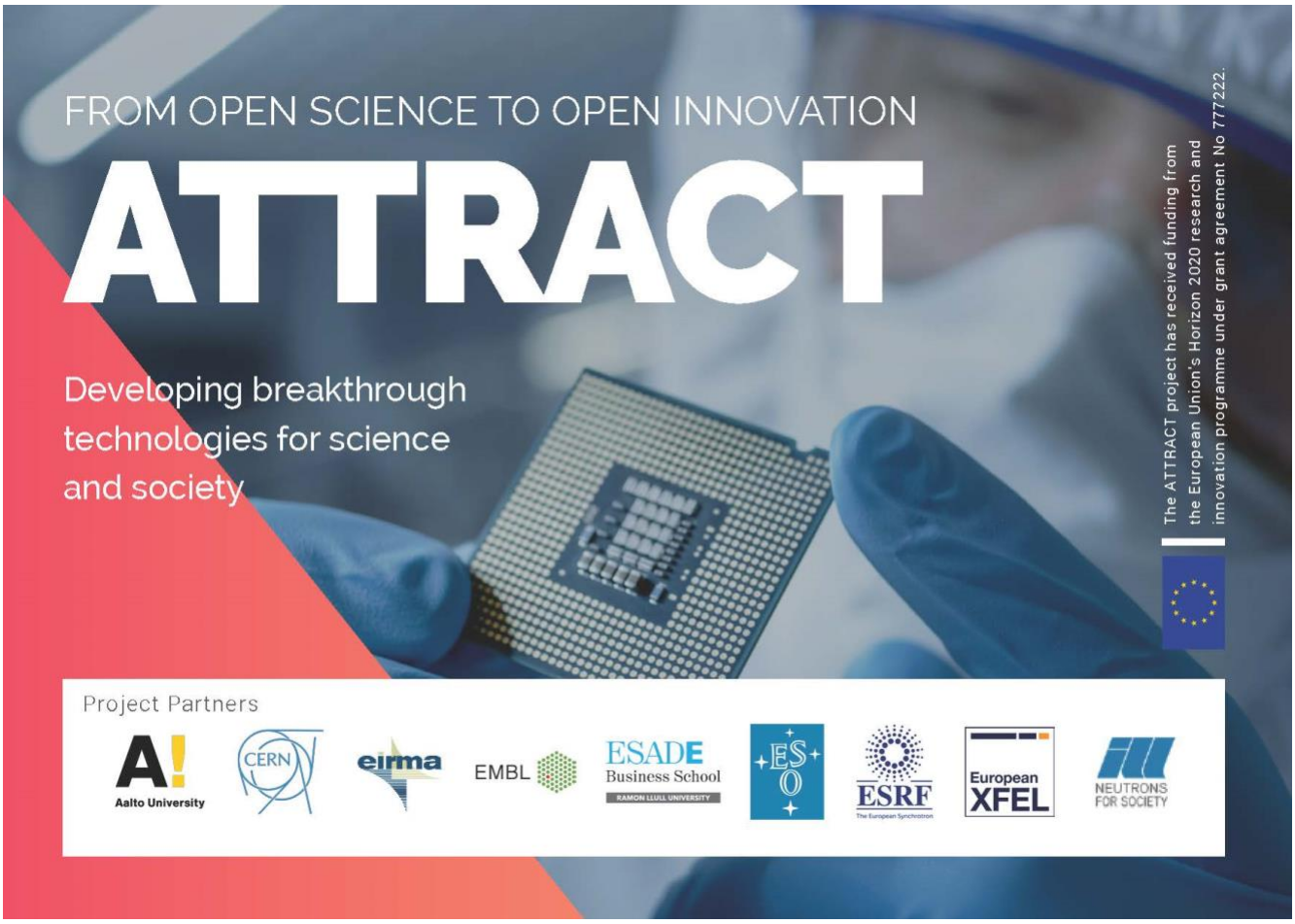
Media Kit

ATTRACT PROJECT



FROM OPEN SCIENCE TO OPEN INNOVATION

ATTRACT

Developing breakthrough technologies for science and society

Media Kit

What is ATTRACT?

Developing scientific breakthrough technologies for society

Why is there no European Google or Amazon? Why have some of Europe's hottest start-ups, such as Sweden's Spotify, moved to Silicon Valley? It is not for lack of great technology or breakthrough science. It is because the **mechanism for scaling up promising ventures** to global markets is simply not working.

Breakthrough innovations are more important than ever to solve the 21st Century's major societal challenges. Many technologies leading to breakthrough innovations with a big impact on people's lives stem from **fundamental research**.

ATTRACT is a pioneering initiative bringing together **Europe's fundamental research and industrial communities** to lead the next generation of detection and imaging technologies.

For the first time, a consortium of big research organisations - that build and operate telescopes, particle accelerators and other capital-intensive scientific instruments - will be explicitly leveraged to **capture value and create jobs and growth**.

THE IDEA

Create a co-innovation ecosystem between fundamental research and industrial communities to develop breakthrough detection and imaging technologies for scientific and commercial uses

THE OUTCOME

A bigger return on Europe's scientific investment that will benefit both the economy and society at large

For this, ATTRACT will enlist large **companies**, experienced **venture capitalists**, and **individual investors** alike. The aim is to create an entirely new, European model of Open Innovation that can become an engine for jobs and prosperity for all.

Funded by the European Commission's Horizon 2020 programme, the project aims to help **revamp Europe's economy** and improve people's lives by creating **products**, **services**, **companies** and **jobs**.

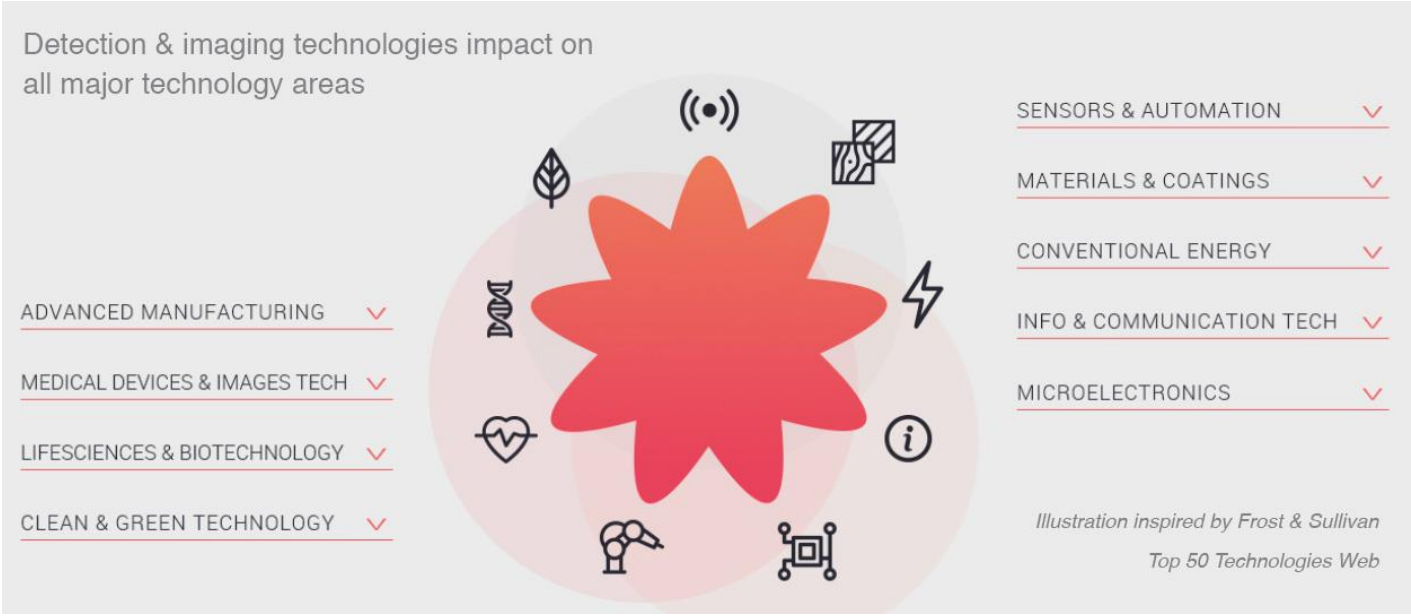
WHY ATTRACT?

ATTRACT **will deliver breakthrough technologies** for global markets and create an ecosystem for investment, entrepreneurship and innovation

ATTRACT will contribute to **getting more value from Europe's science base** and high-end labs by multiplying the economic returns

National and pan-European Research Infrastructures will **work together with industry and investors** to create a new, economically powerful ecosystem spanning the continent

ATTRACT can engage many more citizens in science and technology - as entrepreneurs, customers, or students, and strengthen Europe's talent base



Detection and imaging technologies: key enablers for breakthrough innovation

Cutting-edge detection and imaging technologies – the core research target of ATTRACT – play a key role as enablers for all major technology areas. Most future scientific advances, technical applications, commercially worthwhile products and businesses targeting emerging societal challenges rely on these technologies in one way or another.

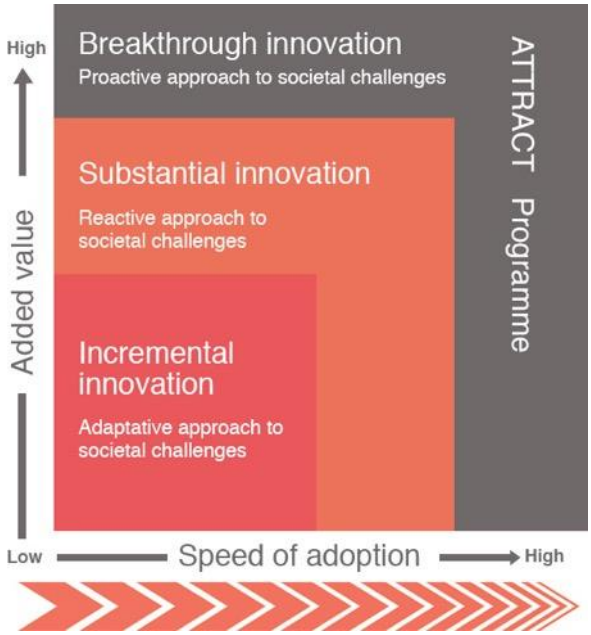
Can new networks of sensors be installed in big farms to make agriculture more productive and less energy-intensive? Can smarter use of monitoring and Big Data analysis make factories work better, cheaper and greener? Can we use sensors to help the visually impaired navigate the world more easily? Can we develop better forms of online learning? Can we pioneer ways to monitor our changing climate more accurately and cost-effectively and develop strategies to mitigate the damage?

Answering these questions requires an open innovation mindset so that **breakthrough innovation concepts** can be rapidly identified, assessed and industrially scaled by multiple experts throughout the innovation value chain. To achieve this, ATTRACT will couple national and European Research Infrastructures, universities and research organisations with actors who can extract societally relevant and commercially interesting innovations from them.

From Open Science to Open Innovation

Traditional incremental innovations may bring about positive impacts on societal challenges, but getting ideas and hunches realised is a lengthy process. The ATTRACT methodology aims to springboard science towards actors with vision for innovation potential.

In contrast to incremental innovation, which generates reactive or adaptive responses to a



problem, **breakthrough innovation is driven by a desire to anticipate emerging or future needs**.

These innovations trigger transformations in the way we think about societally challenging issues or identify solutions that will have real impact on people's lives – for example smaller, portable scanners for patient treatment outside of the hospital, or replacing airplane windows with virtual images which reduces fuel consumption and increases safety of the aircraft.

However, the process of developing new science into technologies that enable **breakthrough innovation** often happens by serendipity. ATTRACT aims to create and deploy mechanisms and frameworks for systematically achieving such transformation.

By coupling research and innovation to a pipeline of **entrepreneurial talent** and **public and private funding opportunities**, ATTRACT seeks to boost Europe's Horizon 2020 Programme. The initiative will promote world-class open science with a view to delivering innovative, future-driven solutions capable of enhancing economic and inclusive growth for a competitive Europe.

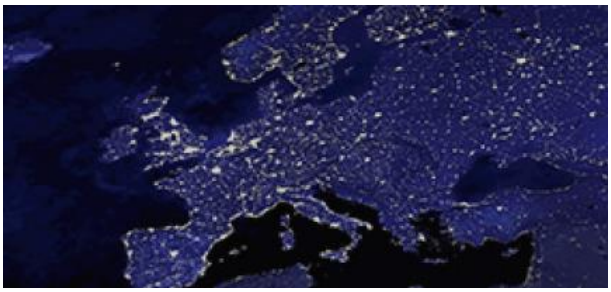
Scope of ATTRACT and sectors it will impact

Medical imaging and radiation detectors

CT, MRI, PET and other hospital scanners (a **€21 billion market**) depend on magnet, detector & imaging technologies. ATTRACT can advance this technology.

Satellite imaging

A **€2 billion market** forecasted to witness a compound annual growth rate of 14.2% during 2018-2023 – and ripe for innovative small and medium-sized enterprises (SMEs) to pioneer new consumer apps and industrial services. ATTRACT image processing algorithms can help advance satellite imaging.



Open data

Sharing data on a massive scale – on electricity, traffic, land, resources and more – can unlock over **€2.7 trillion** in value. ATTRACT labs pioneer new sensors, networking technologies and data analytics to enable this data-driven future.

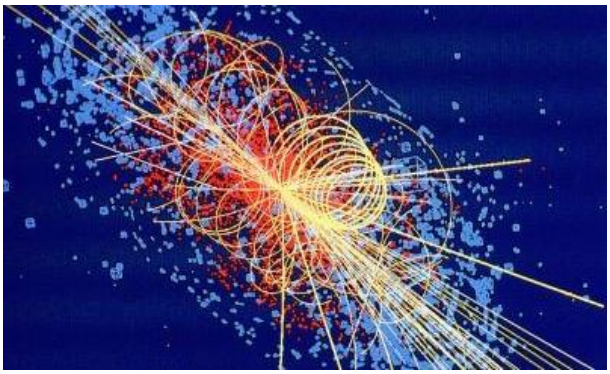
European ICT sector

The value added by this sector represents **4% of the EU's GDP**, and includes technologies such as advanced manufacturing, robotic arms, remote sensors, and opto-mechanical assembles – all areas in which ATTRACT labs excel and that European industry needs.

Leading research infrastructures

Europe is home to more than 600 national and pan-European Research Infrastructure organisations. ATTRACT is led by six of these: CERN, the European Southern Observatory (ESO), the European Synchrotron Radiation Facility (ESRF), the European Molecular Biology Laboratory (EMBL), European X-Ray Free-Electron Laser (European XFEL) and Institut Laue-Langevin (ILL).

The science carried out in the European research laboratories and facilities leading ATTRACT is **globally recognised for its scientific merit** and technological achievement.



At **CERN**, there is the discovery of the Higgs Boson, deep exploration into the nature of matter and the cosmos and, as part of its instrumentation development, invention of the HTTP code that made the World Wide Web possible.

At **EMBL**, there is Nobel-winning embryonic research, new gene editing advances, and drug-developments for TB and other ailments; whilst at **ESRF**, there is also Nobel prize-winning research in cell membranes, ribosomes and proteins. At **ILL**, a flagship centre for Neutron Science, researchers work on engine designs, fuels, plastics and biological processes at the cellular and the molecular level.

ESO telescopes took the first image of a planet around another star, found a planet around the nearest star Proxima Centauri and were part of the discovery of dark energy. At **XFEL** the world's largest X-ray laser which came on line in 2017, is able to map the atomic details of viruses and take three-dimensional images of the nano-world.

This is all cutting-edge science but the work in these labs requires top-class expertise in magnets, detectors, cameras, computers, networks and software. Much of it is purpose-built for the laboratories since it does not exist in today's market. Taken together, the technical and professional expertise at these labs is an extraordinary resource.

ATTRACT hopes to unleash bright ideas from teams anywhere in Europe and **facilitate a fast-track development phase** where potential for future high-impact on economic and social gain can be openly assessed and acted on.

The goal is simple: to increase Europe's return on its scientific investment.

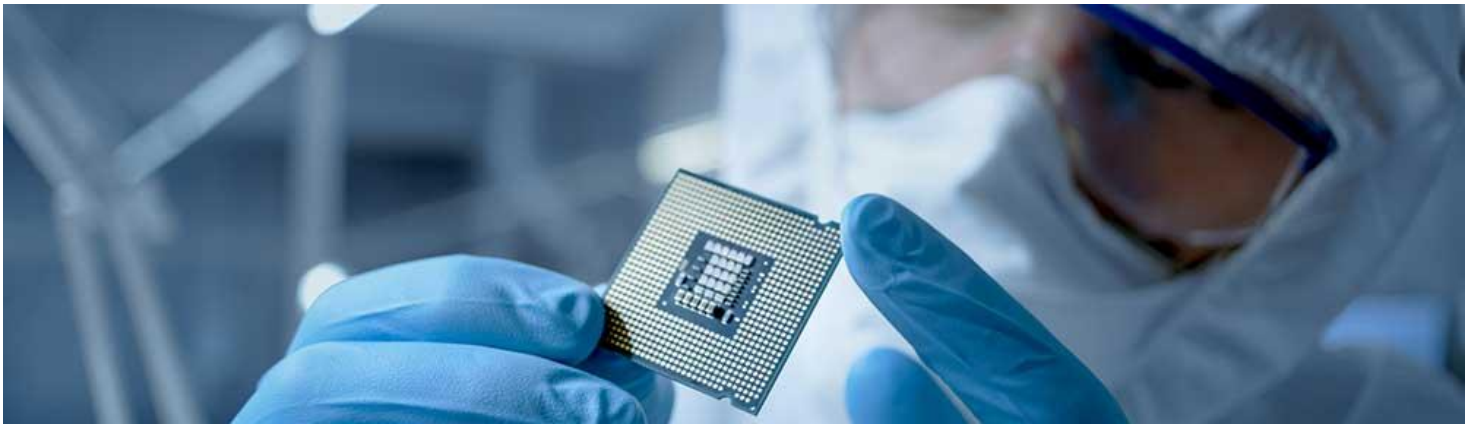
Public investment in science pays dividends: A $13 billion investment in the Human Genome Project in the 1990s has led to an industry worth nearly $1 trillion worldwide, according to a Battelle study. The World Wide Web, pioneered at CERN in the early 1990s, now employs millions. ATTRACT is an initiative to harness that innovative potential for the European economy.

Why does Europe need this initiative?

Europe's laboratories are globally renowned for their scientific progress and world-changing discoveries. They are also adept at contributing their results and know-how to commercial exploitation. However, these are generally individual actions rather than concerted effort from both research and industry to **establish a permanent bridge for technology** and know-how transfer. ATTRACT aims to build an ecosystem around these labs to establish this permanent pipeline for ideas through to investors and industry.

In this era of slow growth and high unemployment, Europe needs more than ever to leverage its research strengths.

Fundamental to Europe's economic recovery are more innovative services to sell, top-class products to export, and well-paying jobs that compete in the global marketplace. Scientists, students, entrepreneurs and investors must work together to invent new services and products, and attract new investment.



Europe has big, long-standing investments in these high-end labs. This has already paid off scientifically: ATTRACT will multiply the societal returns from them in new ways. It can deliver new technologies for global markets. ATTRACT creates the necessary framework for this demanding, high-specification technology to **make the leap from the lab to the market**.

If we are able to boost the innovation process and connect labs with industry, entrepreneurs, investors and other value-creators, we should see a faster turn round of ideas with high potential put to good economic use.

ATTRACT Call for breakthrough ideas

Call for breakthrough ideas to bridge the gap between basic research and real market needs

The **ATTRACT Project** is the first major step in a much quicker technology development pathway that will yield a **faster time-to-science and market** for breakthrough innovations.

€17 million to fund 170 breakthrough projects

To bridge the gap between basic research and real market needs, ATTRACT called **for researchers, entrepreneurs and companies** to bring forward **breakthrough projects** on pioneering imaging and sensor technologies.

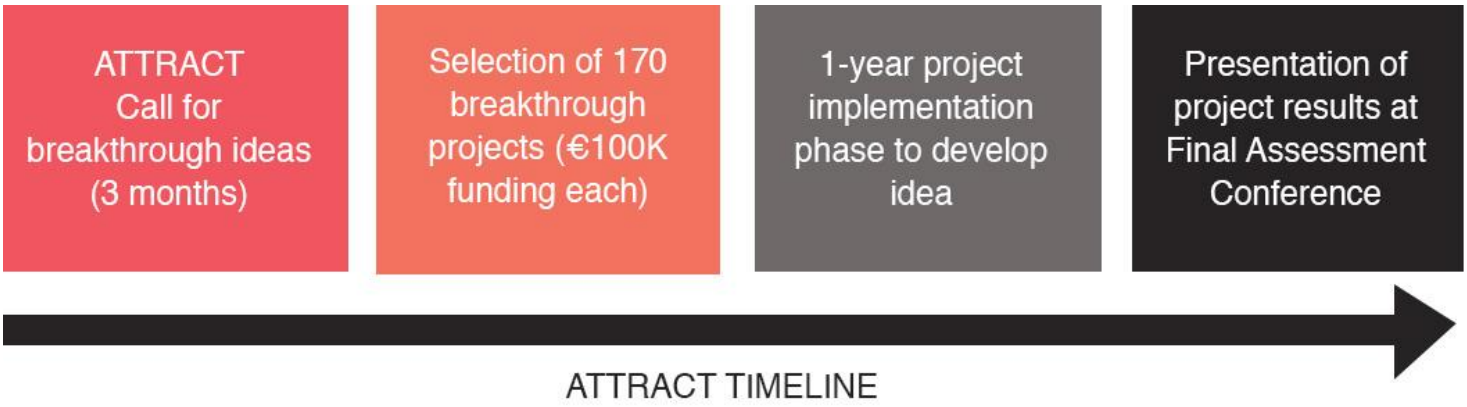
The call opened on 1st August 2018 and applicants had three months to submit their ideas (deadline 31st October, 23:59 hrs CET).

The ATTRACT Project funded **170 breakthrough technology concepts** in the domain of detection and imaging technologies across Europe. The projects were be awarded **€17 million in funding** – €100,000 each in seed funding to carry out their idea.

An independent R&D&I Committee carefully assessed and evaluated proposals and selected those to be funded based on their breakthrough potential and societal impact.

The ultimate goal of this seed-funding mechanism was to help **create new jobs** and **speed up the development of breakthrough technologies** in Europe throughout the detection and imaging value chain: from sensors to computing.

The breakthrough technology projects funded had 12 months to implement and develop their research idea before presenting their work at the Final ATTRACT Conference in September 2020.



High market potential

During the one-year project implementation phase, business and innovation experts from the ATTRACT Project Consortium's AALTO University and Esade Business School provided guidance and coaching assistance to the 170 selected projects.

The goal was to help them explore how their breakthrough technology could be transformed to **breakthrough innovations** with big market potential.

The training support was focused on helping scientists to better **assess the market potential** of their research. The training also helped researchers become **effective partners in business processes** and facilitated the pathway for those researchers interested in becoming entrepreneurs.

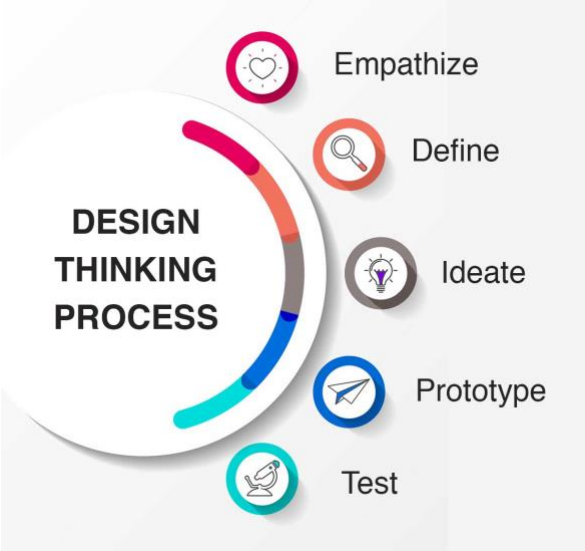
EIRMA provided insights from practising innovators on partnering with industry.

Design thinking methodologies and business pilots

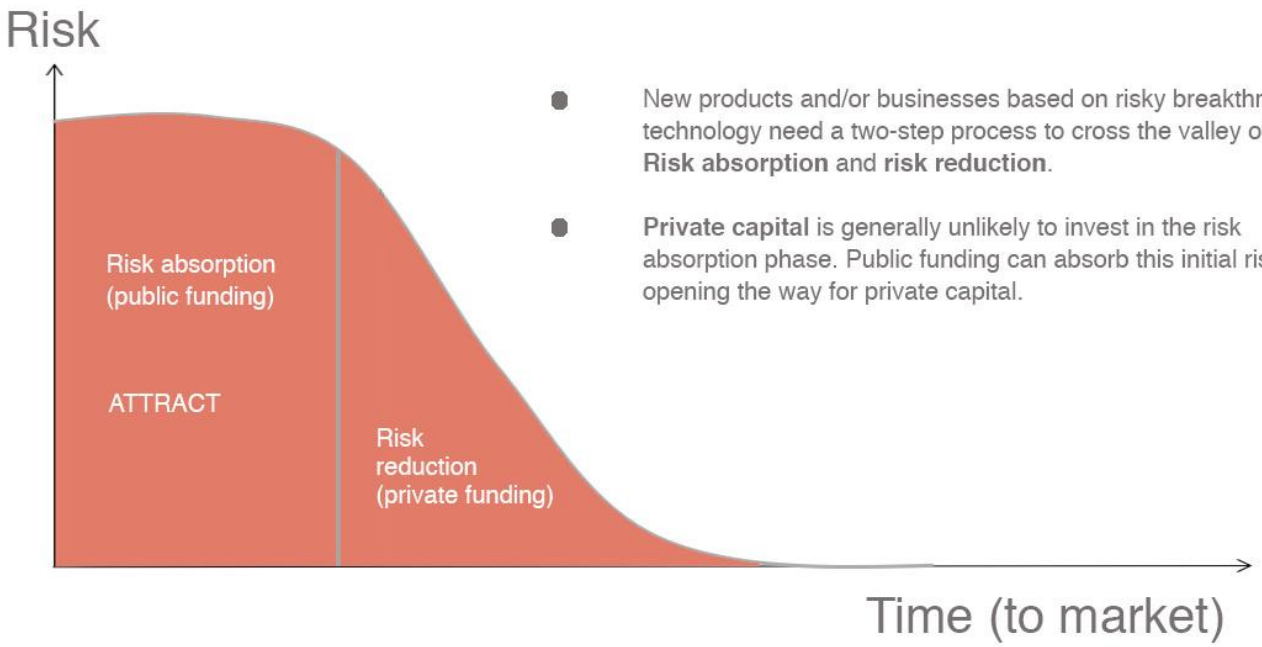
During this implementation phase, the ATTRACT project also ran the 'Young Innovator & Entrepreneurs' Pilot'. This pilot selected promising technologies from the 170 ATTRACT funded projects.

In this phase, Master's in Management students from across Europe were encouraged to apply **design thinking methodologies** to some of the ATTRACT projects' technologies. The first step was to establish a clear societal need and then to identify **potential societal innovations enabled by the breakthrough technologies** inspired by the call projects.

Scientists from the selected projects interacted with the students at the start of their funding term and explained the basic concepts they were going to work on. The students used these insights to identify possibilities in which the technologies could be used to **solve future societal challenges**.



One year after the start of the funded ideas, each of the 170-funded breakthrough projects will present the technical results and an initial business concept at the ATTRACT Final Assessment Conference to take place in Brussels on 22nd September 2020.



- New products and/or businesses based on risky breakthrough technology need a two-step process to cross the valley of dead: **Risk absorption** and **risk reduction**.
- **Private capital** is generally unlikely to invest in the risk absorption phase. Public funding can absorb this initial risk thus opening the way for private capital.

A mechanism to facilitate private investment

ATTRACT will initiate and promote a mechanism to capture the interest of private investors – business angels, venture capital firms and corporate investors – using public funding to help attract **private capital**.

ATTRACT aims to help projects **gain private investment** by clustering opportunities with a clear potential for successful industrial implementation.

The ATTRACT Programme will create multiple **entry points for private investors**, such as business angels, venture capital and corporate investors, who will be able to join the seed-scale innovation funding programme at various points depending on their profiles.

The ATTRACT Project will create a new wave of young entrepreneurs, small ventures and innovative services that can support growth and jobs for years to come.

Once the ATTRACT Project has proven itself by identifying, selecting and guiding 170 high-potential technology concepts, the next phase in the innovation cycle will be to launch an additional scale-funding mechanism.

This will enable Europe's academic research communities, large and small **companies and private investors** to develop these technologies further and ultimately, to market.

Consortium partners

ATTRACT is a research initiative funded by the European Union's Horizon 2020 research and innovation programme and co-lead by the following leading European research institutions:

Aalto University

Aalto University is a multidisciplinary university in the fields of Science and Technology, Economics, Architecture, and Art and Design. It has 409 faculty members and a student body of 20,000, 70% of which are students in Science and Technology. AALTO University was founded in 2010 by merging three Finnish universities: The Helsinki School of Economics, The University of Art and Design Helsinki, and Helsinki University of Technology. The three schools are all leading institutions in their respective fields and in their own right. Aalto University is a multidisciplinary community where Science and Art meet Technology and Business. The university is committed to identifying and solving grand societal challenges and building an innovative future.

European Laboratory for Particle Physics (CERN)

Founded in 1954, CERN is the European laboratory for particle physics. Sitting astride the Franco-Swiss border near Geneva, it was one of Europe's first joint ventures and now has 22 member states. CERN operates a unique range of particle accelerators that enable research into the fundamental particles and laws of the Universe, including the Large Hadron Collider (LHC), the largest scientific instrument on Earth. The 60-year history of CERN is marked with impressive achievements in the construction and operation of powerful linear and circular accelerators. Moreover, CERN offers unique infrastructures for the development of the most sensitive particle detectors in the world, including the four main LHC detectors – ATLAS, CMS, ALICE and LHCb. General-purpose test beam lines provide beams of electrons, muons and hadrons in a very wide energy range for testing the detectors used in the LHC and in its major upgrade, the High-Luminosity LHC, as well as in future colliders and in neutrino experiments.

European Industrial Research Management Association (EIRMA)

EIRMA is a member-led, independent, non -profit organisation that gives a European perspective on the global management of applied R&D and innovation. Its membership includes over 90 major companies and several SMEs, based in over 20 countries and operating in a wide variety of sectors. The Association enables frank discussion between practitioners, and the exchange of practical experience with people who face similar challenges. Any company carrying out R&D and/or innovation in Europe can join EIRMA and benefit from these opportunities to learn from others and to test their ideas and approaches by presenting them to peers.

European Molecular Biology Laboratory (EMBL)

EMBL is Europe's flagship laboratory for the life sciences. Established in 1974 as an intergovernmental organisation, EMBL is supported by over 20 member states. EMBL performs fundamental research in molecular biology, studying the story of life. The institute offers services to the scientific community; trains the next generation of scientists and strives to integrate the life sciences across Europe. EMBL is international, innovative and interdisciplinary. Its more than 1700 staff, from over 80 countries, operate across six sites in Barcelona (Spain), Grenoble (France), Hamburg (Germany), Heidelberg (Germany), Hinxton (UK) and Rome (Italy). EMBL scientists work in independent groups and conduct research and offer services in all areas of molecular biology. EMBL research drives the development of new technology and methods in the life sciences. The institute works to transfer this knowledge for the benefit of society.

Esade Business School

Founded in 1958, Esade ranks among the top ten business schools in Europe in the most important International MBA, Executive Education and university programme rankings.

Esade has agreements and works with over 100 universities and business schools worldwide. The school offers doctoral programmes in management studies and conducts cutting-edge research in the fields of Data Science & Market Decisions, Economics & Finance, Entrepreneurship, Globalisation & Geopolitics, Governance, Innovation & Operations, Strategy, Leadership & People Management and Social Innovation.

European Southern Observatory (ESO)

ESO, the European Southern Observatory, is the foremost intergovernmental astronomy organisation in Europe and the world's most productive astronomical observatory. ESO provides state-of-the-art research facilities to astronomers and is supported by Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Italy, the Netherlands, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom, along with the host state of Chile. Several other countries have expressed an interest in membership.

European Synchrotron Radiation Facility (ESRF)

The ESRF is the world-leading source of synchrotron and a centre of excellence for fundamental and innovation-driven research for imaging and studying the structure of matter at the atomic and nanometric scale in all fields of research. Located in Grenoble, the ESRF owes its success to the international co-operation of 22 partner nations, of which 13 are Members and 9 are Scientific Associates. Following on from 20 years of success and scientific excellence, the ESRF launched the ESRF-EBS -Extremely Brilliant Source- project (150M€ over 2015-2022). Centred on rebuilding the ESRF storage ring, EBS will deliver unprecedented source brilliance and coherence (~100x), offering scientists with a powerful new instrument to look even deeper into the structure of materials and living matter. EBS also includes the construction of new state-of-the-art beamlines, a scientific instrumentation programme with ambitious detector projects and a data management and analysis strategy.

European X-Ray Free Electron Laser Facility (European XFEL)

The European XFEL is a 3.4 km long research facility extending from Hamburg to the neighbouring town of Schenefeld in the German Federal State of Schleswig-Holstein. With its repetition rate of 27,000 pulses per second and a peak brilliance a billion times higher than that of the best synchrotron X-ray radiation sources, the European XFEL enables the investigation of scientific problems in a variety of disciplines, including among many others: Structural Biology, Chemistry, Planetary Science, the study of matter under extreme conditions.

Institut Laue-Langevin (ILL)

The Institut Laue-Langevin (ILL) is an international research organisation that is a world leader in Neutron Science. Since its foundation in 1967, the Institute is a shining example of scientific cooperation. Presently 10 European countries (Spain, Switzerland, Austria, Italy, Czech Republic, Sweden, Belgium, Poland and Slovakia) ensure the necessary financial support for the ILL operation under the governance of 3 Associate Member countries: France, Germany and The United Kingdom. The research conducted at the ILL is dedicated to fundamental research (60%) as well as societal challenges research (40%). It covers a wide range of disciplines such as biology, (green) chemistry, materials science, condensed matter physics, as well as nuclear and particle physics.

Who's who

Project Advisory Committee

ATTRACT's Project Advisory Committee (PAC) comprises leading representatives of international public and private organisations.

The Committee tenders strategic advice on scaling up the ATTRACT Project. In providing such advice, the PAC may establish an open dialogue with public and private stakeholders, including high-level policy-makers, to raise their interest in investing in and continuing the ATTRACT Project.

Members of the Project Advisory Committee:

John Wood
Chair, Project Advisory Committee

Monica Beltrametti
Head of Global Innovation Europe, NAVER Corp

Sergio Bertolucci
Professor, University of Bologna & former scientific director at CERN

Francisco Javier Cáceres
General Manager, INEUSTAR (Spanish Association for Scientific Industry)

Leopold Demiddeler
Managing Director & Founder chez TechBridgeOne

Candace Johnson
President, European Business Angels Network (EBAN)

Daria Tataj
Strategy advisor, board member and entrepreneur

Patrick Terroir
President of Innovation Legal, Chair of LESI patent and technology licensing committee

Special advisors

Henry Chesbrough
Special Advisor of the PAC; Faculty Director, Garwood Center for Corporate Innovation, University of California-Berkeley; Professor, ESADE

Claus Madsen
Senior adviser; Former Senior Counsellor for International Relations, European Southern Observatory (ESO)

Project Consortium Board

The Project Consortium Board (PCB) manages the ATTRACT Project and is the ultimate decision-making body of the Project Consortium.

Members of the Project Consortium Board:

Michael Krisch
Chair, Project Consortium Board; Head of Instrumentation Services & Development Division, European Synchrotron Radiation Facility (ESRF)

Alex Nussem
Secretary General, European Industrial Research Management Association (EIRMA)

Kalevi Ekman
Professor of integrated product development and machine design, AALTO University

Martti Jerkku
Project Manager, Aalto University Design Factory and Deputy PCB member from Aalto University

Thierry Lagrange
Head of Industry, Procurement and Knowledge Transfer, CERN

Andrew McCarthy
Team leader, European Molecular Biology Laboratory, Grenoble Outstation

Paolo Mutti
Head of Instrument Control Department, Head of Scientific Computing Department, Institut Laue-Langevin

Thomas Tschentscher
Scientific Director, European X-Ray Free Electron Laser Facility (European XFEL)

Jonathan Wareham
Dean of Faculty & Research, ESADE Business School

Andrew Williams
External Relations Officer, European Southern Observatory (ESO)

Project Administrative Office

The Project Administrative Office (PAO) is the dedicated administrative body for the delivery of the ATTRACT Project.

Markus Nordberg
Head of Resources Development of the Development and Innovation Unit (IPT-DI), CERN

Pablo Garcia Tello
EU Support Group, Section Head Development of EU Projects & Initiatives, CERN

Romain Muller
EU Projects Officer, CERN

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