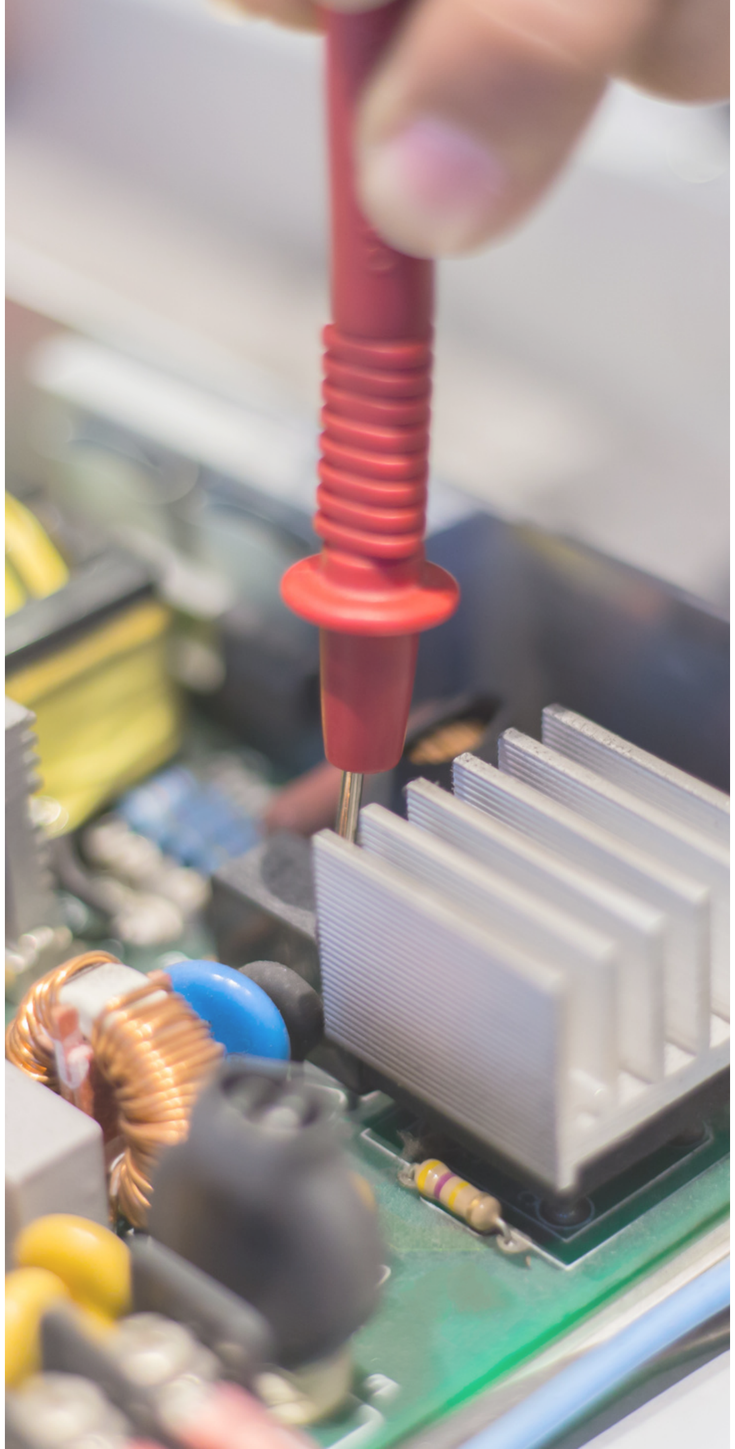
CEUP2030



Interreg CENTRAL EUROPE
European Union
European Regional Development Fund

CEUP 2030

SMART AND ADVANCED MATERIALS

Project co-funded by European Regional Development Fund.

CONTENT

Introduction
Impact radar
Policy Intelligent Dashboard
Flagships
Use cases
Policy instruments

INTRODUCTION

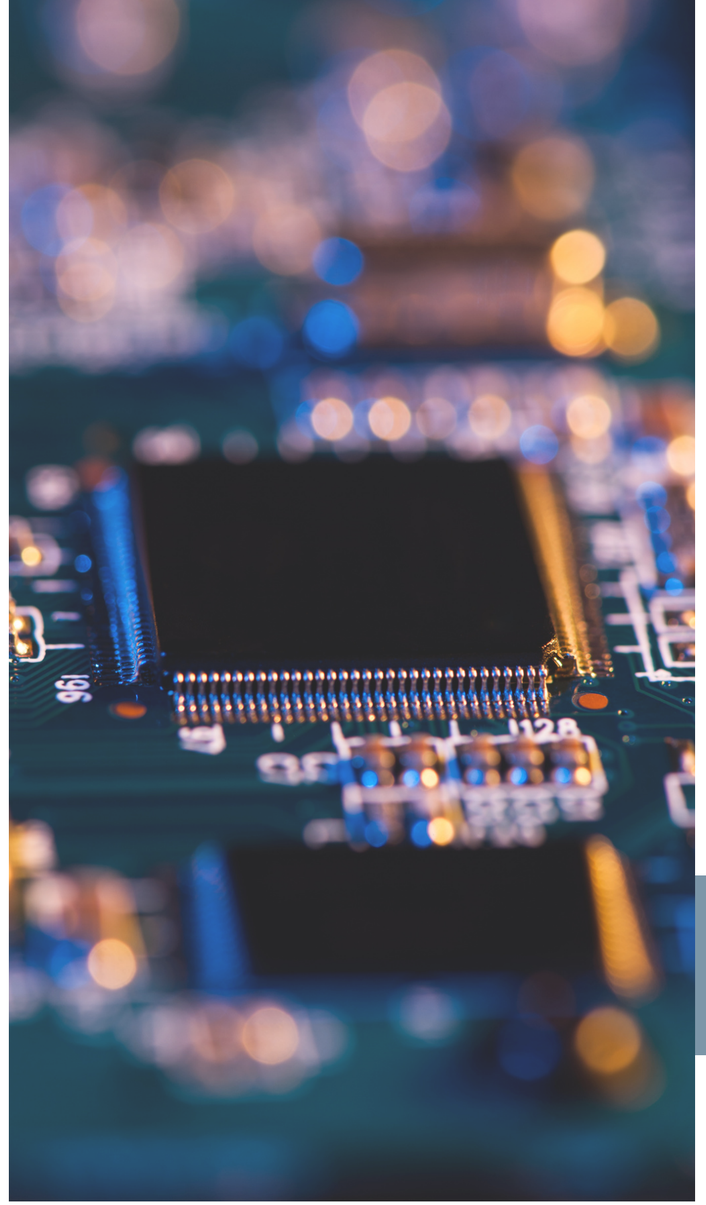
From the past two decades, science and technology have made great improvements in synthesizing the new materials. They are divided mainly into four categories which are polymers, ceramics, metals, and smart materials. Among them, smart materials are becoming more popular because they have various applications as compared to standard materials. The special materials that can change their properties such as materials which can change its shape just by adding some heat or can change its phase instantly when placed near magnet are called smart materials.

Smart materials are also known as advanced materials or intelligent materials. They cannot be defined by a single specific definition. They can be defined as materials that can recoil their original shape to specific stimuli, or it can be defined as advanced materials that can respond smartly to environment changes. Smart materials are categorized on the basis of their properties such as active and passive, passive smart materials have ability to transfer a type of energy e.g. optical fibers are able to transfer electromagnetic waves.

The fourth industrial revolution, namely Industry 4.0, is the recent movement on intelligent automation technology. In this new era, the utilization of modern manufacturing skills within the context of integrating novel information technologies plays an important role on economic competitiveness.Possible New Materials applications in the I4.0 and advanced manufacturing:

AUTOMOTIVE APPLICATIONS

In a modern passenger car there are several electromagnetic actuators for different functions, including comfort systems for the driver and passengers, actuators for engine control or vehicle control, servo- microactuators for power systems and aerodynamics. New approaches based on smart materials, instead of the traditional electromagnetic motors, can simplify in most cases the actuation, performing the same function with reduced size, weight and cost, optimising the movement and also offering the opportunity to implement new functions. The use of SM actuators as an alternative to electromagnetic motors for automotive applications, particularly for comfort purposes, shows some main advantages: smooth direct movement with high torque or force, no additional mechanism, noiseless operation and intrinsic reliability, since the motion is related to the physical properties of the material.



3D PRINTING FOR SOFT ROBOTICS

3D printing is an additive manufacturing (AM) process defined as the process of joining materials to make objects from 3D model data, usually layer upon layer, as opposed to subtractive manufacturing methodologies, such as traditional machining. 3D printing can deliver parts of very sophisticated and complex geometries with no need of post-processing, built from custom-made materials and composites with near-zero material waste, while being applicable to a diversity of materials, including smart materials such as shape memory polymers and other stimulus-responsive materials. One of the main example of the design freedom offered is that conventional assemblies can be restructured in a single complex structure that could not be manufactured with the current manufacturing processes. Another driver of the 3D printing technology is that it is environmentally and ecologically favourable. 3D printing technologies and methods are growing frequently in terms of application and market share, spreading into various manufacturing divisions, such as robotics, motorized, health and aerospace and are expected that this substantial growth will continue over the next few years.

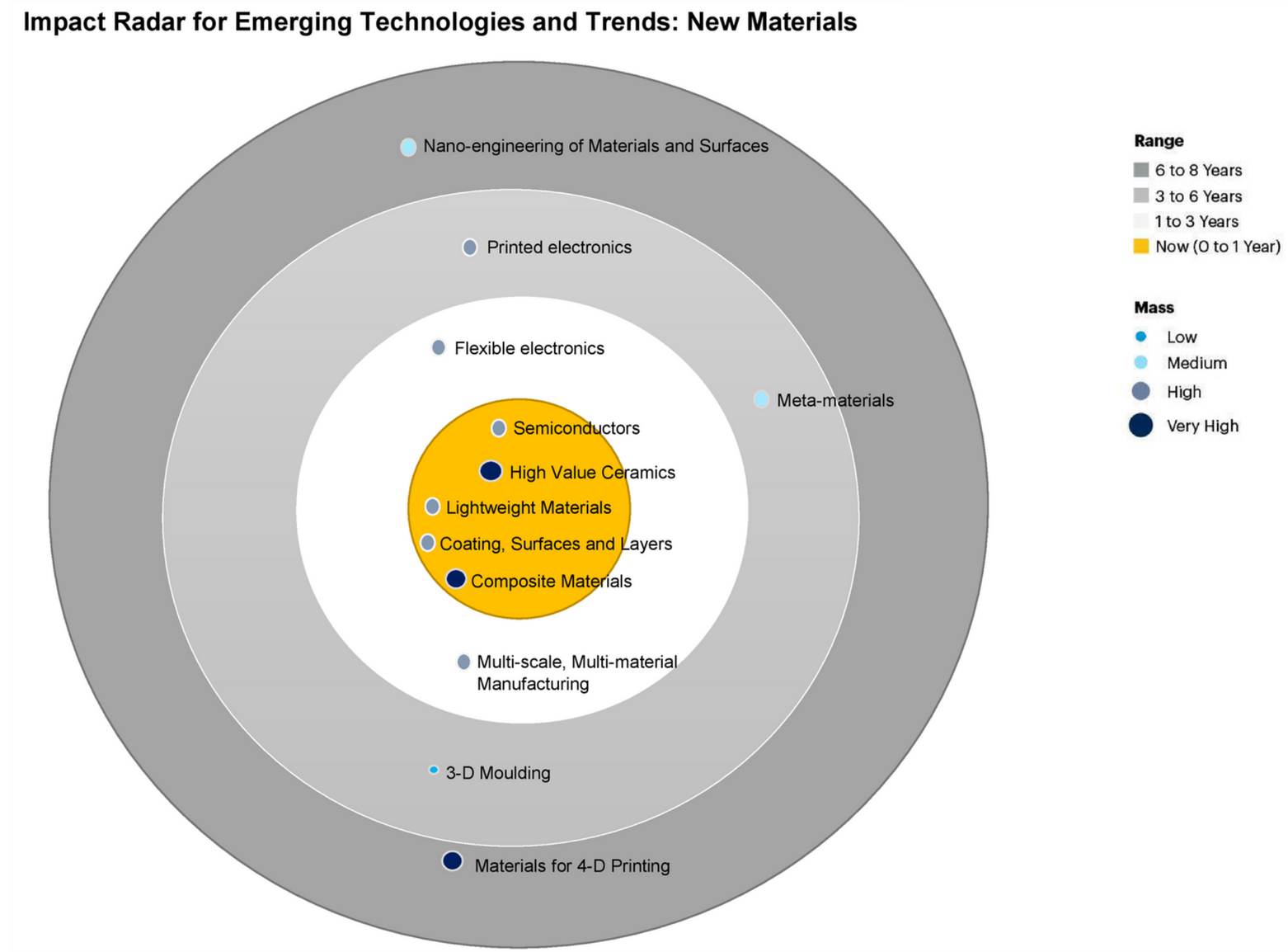
Soft robots do not require fluidics, pneumatics or inflation instead of which they need tendons, shape memory coils, muscle-like actuators, etc. [42]. Hence, they can be built from commercially available soft materials and 3D printers, with a drawback that such materials cannot be transformed in every desired way. Furthermore, 3D printing has a limitation of speed and difficult scalability so currently the work on soft robotics is going on within the technological constraints of currently available 3D printers. 3D printing is a very slow process, but this is not a major issue, as no-one at this initial stage is looking for the mass production of soft robots. Yet the high specificity and ability to print the most complex shapes makes 3D printing an extremely attractive choice for the fabrication of soft robots. Power sources are an integral part in most of the newly developed soft robots [43] and 3D printing is an extremely useful technique to intelligently place them inside soft structures. However, one fundamental concern in using 3D printing technology for developing soft robots is that 3D printable soft materials have a large tendency to deform under the normally used forces during the building process due to their own weight so a support material becomes a necessity.

SMART GRID AND NANOTECHNOLOGIES: A SOLUTION FOR CLEAN AND SUSTAINABLE ENERGY

For the first time in recorded history, more people worldwide are living in urban areas than in rural. The urbanization trend picked up pace in the 20th century and has accelerated since. Urbanization manifests itself in two ways: expansion of existing cities and creation of new ones. Cities are already the source of close to 80% of global CO2 (carbon-dioxide) emissions and will account for an ever-higher percentage in the coming years. Too much CO2 in the atmosphere has been linked to climate change. If humanity continued with the same solutions that have been used to address urban development needs in the past, the resulting urban ecological footprint will not be sustainable: we would need the equivalent of two planets to maintain our lifestyles by the 2030s. The challenge is to meet the demands of urbanization in an economically viable, socially inclusive, and environmentally sustainable fashion. According to a World Energy Council study,3 global demand for primary energy is expected to increase by between 27% and 61% by 2050. Climate change is expected to lead to changes in a range of climatic variables, most notably temperature levels. Since electricity demand is closely influenced by temperature, there is likely to be an impact on power demand patterns.

Cyber-physical integration facilitates smart factories with high efficiency that are capable of fabricating high quality customized products. On one side, the advancement of information technology has accelerated the transition to forthcoming industrial era. In fact, the existence of the fourth industrial revolution substantially depends on the capabilities of AM. These issues were summarized in three specific topics in this paper, namely material, processes and design issues. In the future, it is likely that more interdisciplinary research efforts should be expended. On the other hand, the role of designers, factories, and customers will be redefined remarkably since the manufacturing business will be distributed to many separate locations like small workplaces or homes. In other words, the current barrier of mass production on location will be overcome with personal- and customized fabrication. Another popular trend aims at creating functional parts/machines in just a single step of fabrication. Due to the opportunities provided by the novel AM technologies, the design- and production challenges are only restricted by the imaginations of the individuals.

IMPACT RADAR



POLICY INTELLIGENT DASHBOARD

The CEUP 2030 Partnership would like to invite all interested stakeholders to explore Policy Intelligence Dashboard - policy tool to streamline, process and manage the knowledge for improved policy decision making, in a practicable and sustainable manner.
Policy Intelligent Dashboard is the most complete one-stop-shop for policy makers and policy influencing stakeholders as research technology organizations and enterprises operating around Advanced Manufacturing and Industry 4.0 topics.
PID gathers in one place practical and streamlined knowledge and insight on technology trends and potential industry impact for the entire innovation eco-system. Each CAMI4.0 area: Intelligent Production Systems, Automation and Robotics, Smart Materials and Artificial Intelligence represents a Tech Radar, where policy-relevant data sources as use cases, financial instruments, flagships and organizations are presented with a goal to support, transfer and enrich policy decision making processes in the area of key technologies.

PID is located on the http://ceup2030pid.eu/ -website and integrate knowledge and insight developed from dialogue occurring within the Partnership's workshop series includes the following elements for each CAMI4.0 topics :

INTERESTING USE-CASES

Each project partner provided contributions of thematic use cases/developments from regional companies/DIHs in connection with every thematic topic identified in the CEUP project.

SUMMARY OF THE FLAGSHIPS

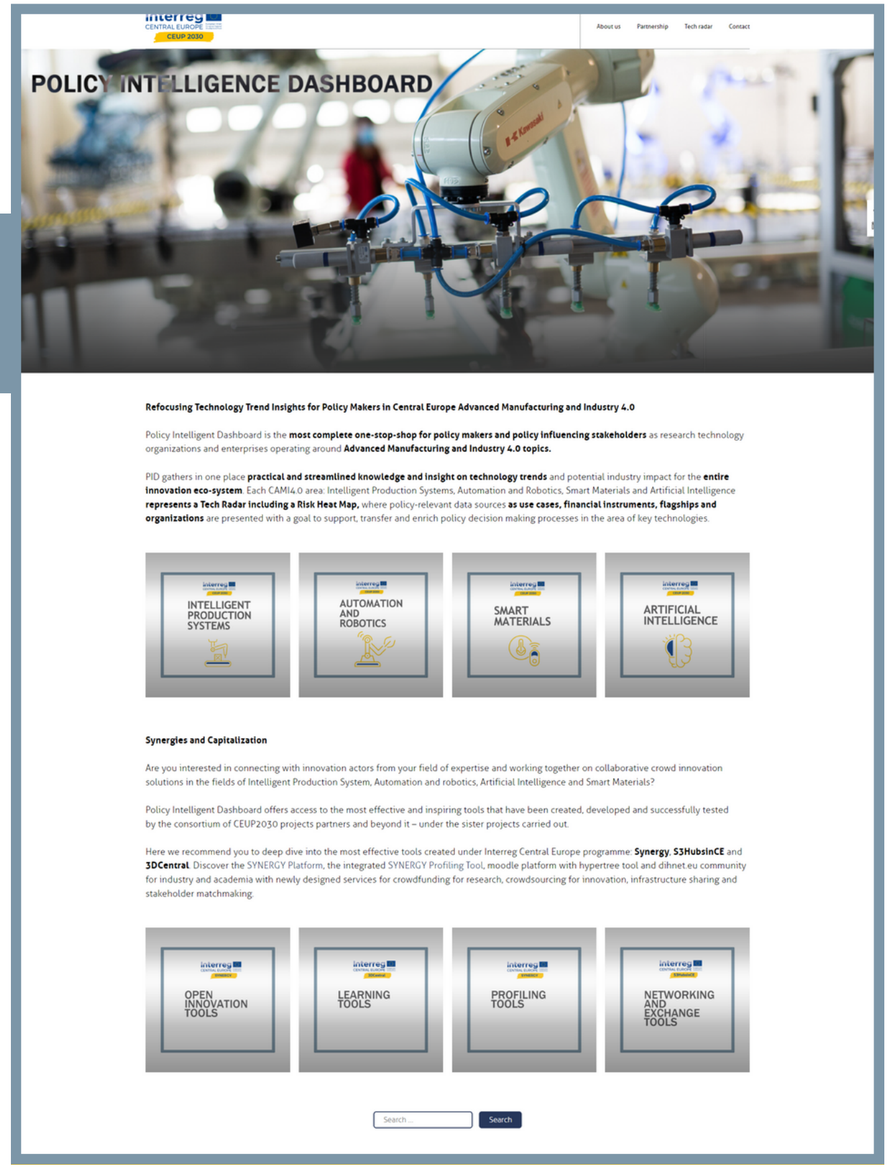
Flagships are significant initiatives which clearly add value or deliver enhanced competitive advantage to the innovation eco-system surrounding advanced manufacturing and industry 4.0

POLICY INSTRUMENTS

One of CEUP 2030's main goals is to exchange information and good practice examples regarding policy instruments that are being used and deployed in Central Europe.

ANALYSIS OF THE TECH RADAR

The Tech Radar and Risk Heat Map offer open access to policy-relevant data sources as use cases, policy instruments, organisations and networks, technology trends in the most convenient, practicable and efficient way.



Policy Intelligent Dashboard offers access to the most effective and inspiring tools that have been created, developed and successfully tested by the consortium of CEUP2030 projects partners and beyond it – under the sister projects carried out.

We recommend you to deep dive into the most effective tools created under Interreg Central Europe programme: Synergy, S3HubsinCE and 3DCentral. Discover the SYNERGY Platform, the integrated SYNERGY Profiling Tool, moodle platform with hypertree tool and dihnet.eu community for industry and academia with newly designed services for crowdfunding for research, crowdsourcing for innovation, infrastructure sharing and stakeholder matchmaking.

Check the Policy Intelligent Dashboard now!

http://ceup2030pid.eu/

FLAGSHIPS

Looking back at the beginnings of the CEUP2030 project, the partners analyzed their ecosystems and gathered needs in the 4 Technology innovation networks. For smart materials, the main issues were the need for best practice examples, more inter-organizational and international connectedness, and access to expertise, technologies, and knowledge. After this analysis and the talks among the TIN group, the common issues and challenges in the flagships mainly are letting SMEs participate from research results and knowledge, building strong networks and communities along with technical concepts as well as internationalization.

STEPUP SMART³

The purpose of the project is to further develop the services and USPs for companies in the region. The overall goal should be to increase the number of the memberships in smart³ network and of cooperations /cooperation projects to boost the impact of the smart materials community.

STRATEGIC COMMUNITY ON ADVANCED MATERIALS

The “Advanced Polymers” Strategic Community should represent the regional capabilities and expertise in the field along the whole value-chain and identify research challengesand industrial needsto foster the innovation.

EU-ALLIANCE

EU-ALLIANCE aims to support SMEs internationalisation in the fields of technical textile, connectivity and advanced materials to address dual use markets in four targeted countries: The United States, Canada, Japan and Indonesia.

GREEN 4.0

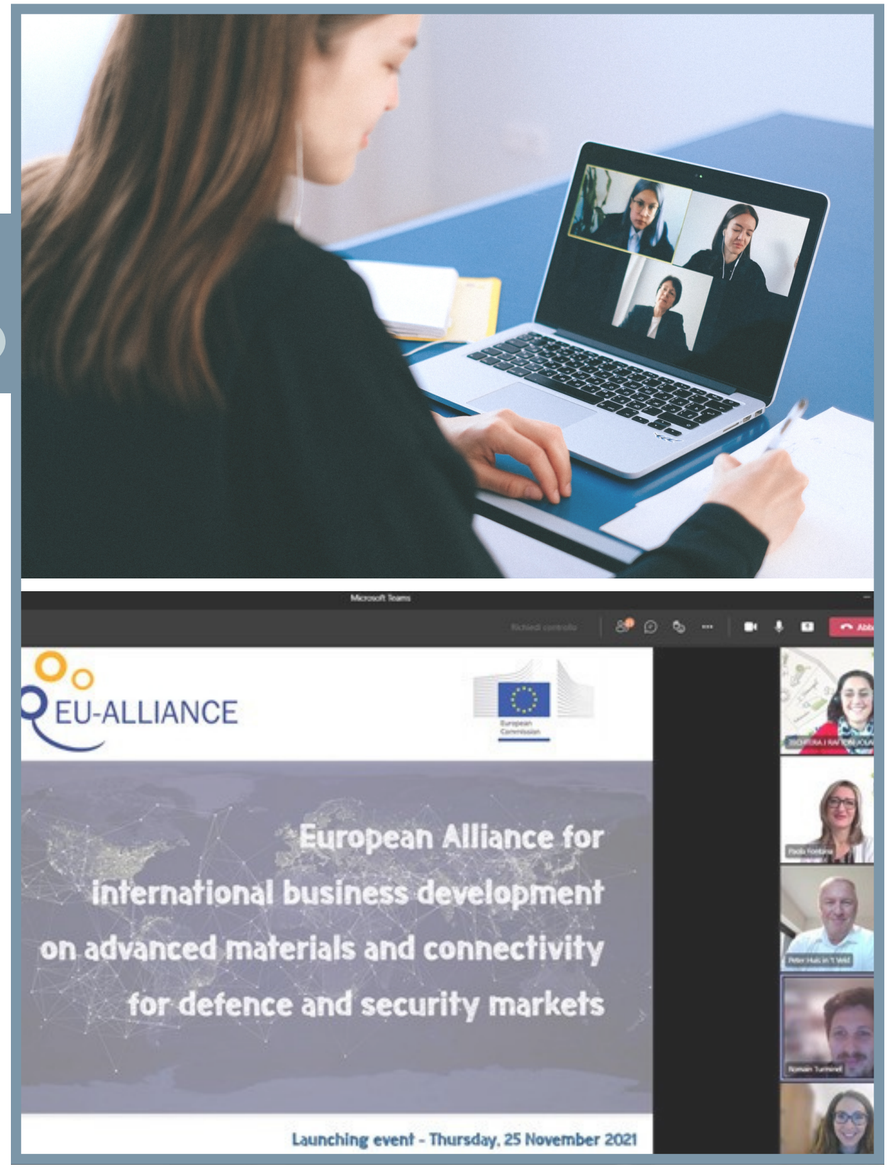
The scope of the project is to improve regional ecosystems' innovation capacities for supporting the transition to sustainable business models in CE manufacturing sector, by piloting customized innovation models

STEPUP smart³

The purpose of the project is to further develop the services and USPs for companies in the region. The overall goal should be to increase the number of the memberships in smart³ network and of cooperations /cooperation projects to boost the impact of the smart materials community. The project aims at identifying and developing new cooperation partners in Germany and internationally, establishing new offers in English, generally new services to provide incentives and stimulate innovation and participate in roadshows and events.

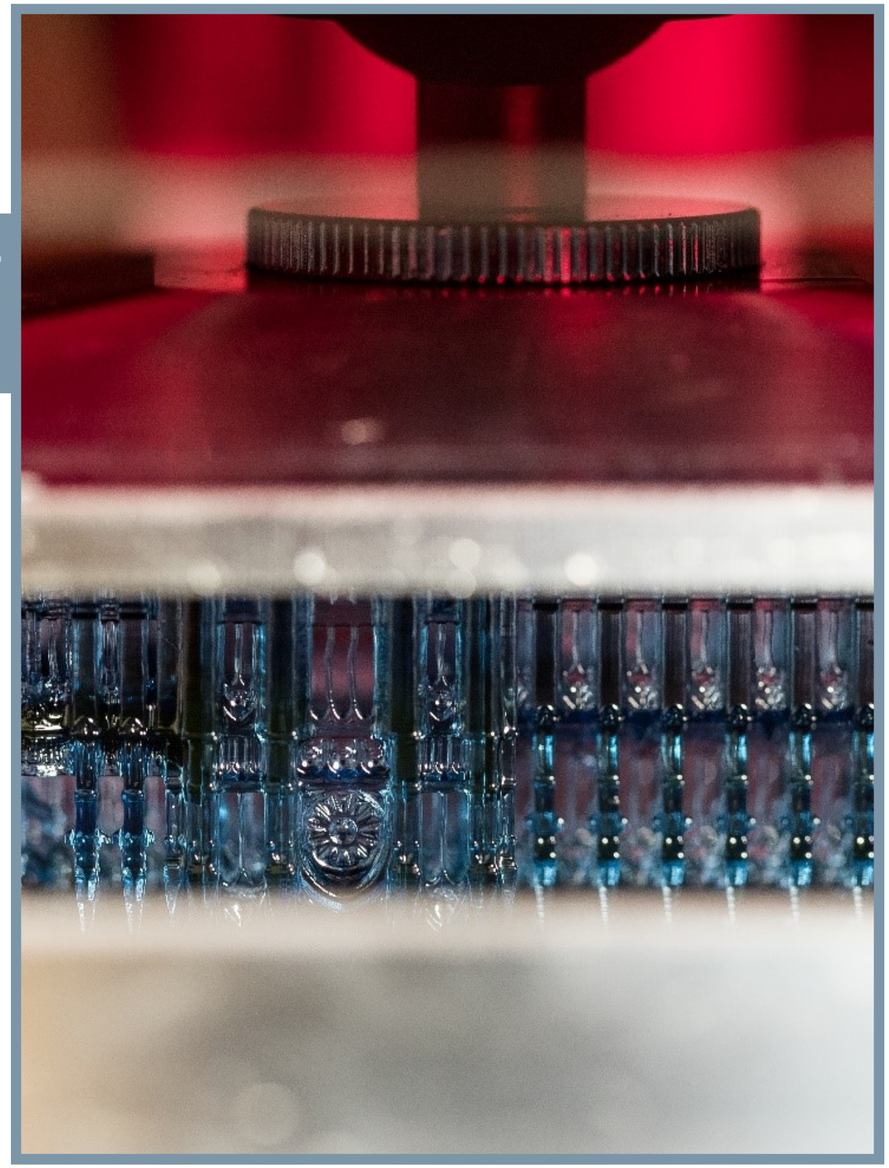
Strategic Community on Advanced Materials

Plastic sector isone of themost relevant areafor Lombardy economy andAFIL constituency involvesa good number of stakeholders operatingin this field. However, theactivities in thiscontext were mainly associated to sustainability and Circular Economy rather than on innovative materials. Since this is a key aspect for the future development of this sector, AFIL wants to foster thecreation of anew Strategic Community focused on functional plastics.The “Advanced Polymers” Strategic Community should represent the regional capabilities and expertise in the field along the whole value-chain and identify research challenges and industrial needsto foster the innovation. Once setup the workinggroup, the StrategicCommunity should plan activitiesaimed at increasing the regional competitiveness and constitute new synergies and collaborations at interregional and European level, for example within Vanguard Initiative.



EU-ALLIANCE

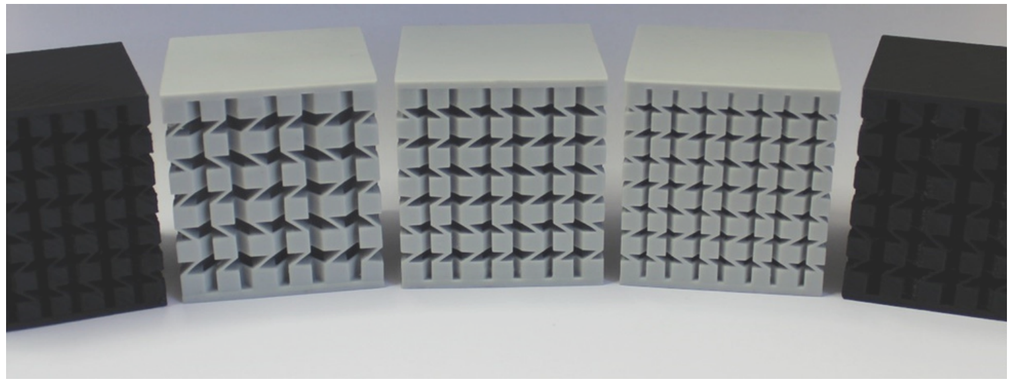
EUropean ALLiance for International business development on Advanced materials and coNnectivity for defenCe and sEcurity markets. EU-ALLIANCE aims to support SMEs internationalisation in the fields of technical textile, connectivity and advanced materials to address dual use markets in four targeted countries: The United States, Canada, Japan and Indonesia. It gathers 6 clusters specialized in each covered thematic: technical textile and advanced materials (Techtera, CS-POINTEX and NTT), defence and security (NDIV) and connectivity (SIIT and Systematic). The different partners are complementary to each other in terms of skills, networks, SME members and international experiences to set up the most efficient partnership possible and demonstrate their abilities to work together in a cross sectoral environment. In this regard, the use case will clearly intensify cluster and business network collaboration across borders and across sectoral boundaries.



GREEN 4.0

The scope of the project is to improve regional ecosystems' innovation capacities for supporting the transition to sustainable business models in CE manufacturing sector, by piloting customized innovation models which create new regional and transnational value chains, link manufacturing companies with solution providers and private equity, increase knowledge and user acceptance regarding smart manufacturing (green industry, digitalization) and transfer piloted programs and tools to RIS3 authorities.

USE CASES

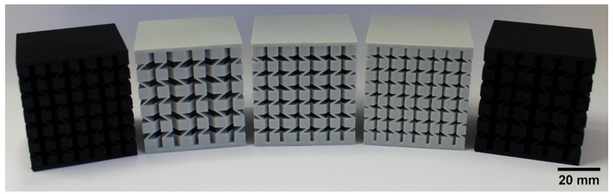


1.SmaDi - Digitalisation of smart materials and their manufacturing processes

Technical progress in recent decades has led to mechanical systems being combined into mechatronic systems with the help of electrical control and data processing. So-called "smart materials" play a central role in this process. These have the distinctive property of reacting to external influences (such as electrical, magnetic and thermal stimuli), e.g. by deformation. Due to the complex material behavior, which depends on the manufacturing process, the targeted development of smart materials requires an exact description of the properties and the necessary manufacturing processes. In the interdisciplinary consortium SmaDi, consisting of researchers from complementary fields of computer science, materials science and engineering, efficient ways of accessing and analysing large amounts of data from experimental tests and simulations are therefore being developed for the first time across different smart materials. Approaches for material production and application are derived from this and an application-specific comparison is made possible.
On the one hand, the focus is on comprehensive modelling and computer-based description of the smart materials under consideration. On the other hand, an information technology query system is being established that answers abstract queries about the materials using the existing models and data. The results aimed for in the SmaDi consortium will therefore considerably reduce the research effort in the selection and optimization of materials in the future and lead to tailor-made product developments, from which above all the SMEs involved in the market will benefit. In perspective, this reduces the market entry hurdles for suppliers of smart materials and thus enables the development, establishment and dissemination of future-oriented products. Based on the overarching approach for smart materials, the information technology solutions developed can also be transferred to other material classes and can be used in cooperation with the MaterialDigital innovation platform for other utilization sectors.

2.A meta material with variable rigidity ready for industrial applications

The Austrian Polymer Competence Center Leoben (PCCL) is a leading centre for cooperative research in plastics technology and polymer sciences. The PCCL helps to create innovative products through the development of new materials with complex properties.
One material that was recently developed at the PCCL is a meta material (i.e., an artificial material engineered to have certain properties) with variable and definable stiffness in three dimensions. The new material can be created through additive manufacturing (3D printing) from different raw materials like plastics or metal. The structure developed allows independent, local and gradual stiffness variation over several orders of magnitude creating interesting areas of potential application within the manufacturing sector.
For instance, the material could be used in the manufacturing of machines or medical equipment like prosthetic implants.



3.FiberEUse project: composite materials reuse, Lombardy

FiberEUse (Large scale demonstration of new circular economy value-chains based on the reuse of end-of-life fiber reinforced composites) project was aimed at integrating innovative solutions and processes in a holistic approach in order to allow composite recycling and reuse in value-added products. It focused on glass and carbon fiber reinforced polymer composites (GFRP and CFRP) used as structural materials in many manufacturing sectors like transport, constructions and energy due to their lightweight and corrosion resistance, that nowadays are mostly landfilled. The project based on the realization of three macro use-cases, further detailed in eight demonstrators:

- Mechanical recycling of short GFRP and re-use in added-value customized applications, including furniture, sport and creative products. Emerging manufacturing technologies like UV-assisted 3D-printing and metallization by Physical Vapor Deposition will be used.
- Thermal recycling of long fibers (glass and carbon) and re-use in high-tech, high-resistance applications. The input product will be End-of-Life wind turbine and aerospace components. The re-use of composites in automotive (aesthetical and structural components) and building will be demonstrated by applying controlled pyrolysis and custom remanufacturing.
- Inspection, repair and remanufacturing for End-of-Life CFRP products in high-tech applications. Adaptive design and manufacturing criteria will be implemented to allow for a complete circular economy demonstration in the automotive sector.

POLICY INSTRUMENTS

WHICH MIGHT INFLUENCE THE DEVELOPMENT OF THE FLAGSHIPS

1.VANGUARD INITIATIVE | I3 INTERREGIONAL INNOVATION INVESTMENT

The Vanguard is based on interregional collaboration and the establishment of synergies among different EU regions based on S3strategies. Tts self-evident, thatdeveloping this community will generate benefit for local stakeholders but it can also represent a value added for the other territories to which we will be connected. Considering that the use-case is focusing on the generation of a community of stakeholders around an interest topic (i.g. Smart Materials), the Vanguard Initiative is opportunity toconnect with regionswho are developing innovation projects on smart and new materials.

2.FUNDING SCHEME. COSME CALL COS-CLUSINT-2020-3-01

The main objective of this action is to intensify cluster and business network collaboration across borders and also across sectorial boundaries and to support the establishment of European Strategic Cluster Partnerships. Every SME in Europe, Japan, US, Indonesia and Canada could benefit from EU-ALLIANCE

3.HORIZON-CL4-2022-RESILIENCE-01-10: INNOVATIVE MATERIALS FOR ADVANCED (NANO)ELECTRONIC COMPONENTS AND SYSTEMS (RIA)

Actions under this topic address one or more of the following technologies:

- Innovative materials design and processing for devices based on new and emerging technologies, including advanced methods of data driven materials design, for e.g. spintronics, neuromorphic, in-materio computing multisensing, photonics, nano-mechanics advanced ferroelectrics or biosensing;
- Heterogeneous integration of new materials (such as PZT, graphene, titanium oxide or aluminium oxide, etc.) for miniaturised sensor and actuator modules.

4.HORIZON-CL4-2022-RESILIENCE-01-13: SMART AND MULTIFUNCTIONAL BIOMATERIALS FOR HEALTH INNOVATIONS (RIA)

Multifunctional biomaterials play a major part in shaping the future of Advanced Therapies and Medical Devices. Health applications may include but are not limited to tissue engineering, artificial organs, implants, bioinks for bioprinting platforms, microfluidics, bioactive scaffolds, wearable and implantable devices, in-vitro diagnostics etc.
This topic is open for international cooperation where the EU has reciprocal benefit, while excluding industrial competitors from countries where the safeguarding of IPRs cannot be guaranteed.

5.THE INNOSUP INITIATIVE

The INNOSUP initiative addresses the challenge to develop new cross-sectoral industrial value chains across the EU, by building upon the innovation potential of SMEs. The EU needs to support the development of emerging industries, which will provide the growth and employment of the future. The reindustrialisation of the EU's industrial base has to focus on the development of long-term internationally competitive goods and services that require combining different competences and innovative solutions. The development of new industrial value chains calls for the collaboration and integration of different innovation actors, including large enterprises and especially SMEs, across different sectors towards the implementation of a joint vision.

6.COMET - E.G. PRO²FUTURE–PRODUCTS AND PRODUCTION SYSTEMS OF THE FUTURE

COMET is a Austrian Program which was established 20 years ago. It is a program for research for and with Industry. Companies have to pay app . 50% of the budget (20 Mio € for 4 years) in Cash and InKind, so the research must be on a high level and in the interest of the companies. Its not an SME program, is more related to research for and with Large Industry. It si very specific instrument targeted to the industry. COMET is an European wide best practice example combining high level research with industrial interests.

7.PUSHING INNOVATION IN MANUFACTURING THROUGH DIFFERENT APPROACHES

“Production of the Future" is a national Austrian funding scheme that aims to promote cooperation between business and science, build up human resources and develop research infrastructure. The production of competitive products and the increase in productivity to secure economic growth in Austria are the funding scheme’s goals. Projects with a particularly high innovation content and increased development risk are the focus of funding.
There are two opportunities for receiving funding from “Production of the Future”:
National submission opportunities are regularly offered for funding regular R&D projects, lighthouse projects, and R&D services. Furthermore, endowed professorships and research infrastructure projects such as "Industry 4.0 pilot factories" were funded in order to make innovative production technology and ICT accessible to both scientists and companies.
Transnational submission opportunities exist via the European Research Area Network M-ERA.NET "ERA-NET for research and innovation on materials and battery technologies, supporting the European Green deal".
Bilateral submission opportunities have existed with China since 2014.

8.TECHNOLOGY PROMOTION BY THE SÄCHSISCHE AUFBAUBANK SAB (CENTRAL DEVELOPMENT AGENCY OF THE FREE STATE OF SAXONY)

To make it easier for companies to access new technologies, the Free State of Saxony has set up a range of support measures. They can take advantage of these support opportunities to introduce innovative products and processes in their companies and thus increase the competitiveness.
The following funding measures are available:

- R&D project funding in the form of individual company projects or joint projects in cooperation between companies and/or companies and research institutions. The measures serve to develop new or improved products and processes.
- Technology transfer funding (exclusively for SMEs) can be used to promote the acquisition of technical knowledge for the realization of new products or processes or those adapted to a new state of the art. Adaptation developments and consulting services can also be part of the project. The grant amounts to 50% of the eligible costs.
- The innovation award (exclusively for SMEs) supports the use of external R&D service providers for the development of new or improvement of existing products, processes and services as well as technical support in the implementation phase with grants of 50% of the eligible costs, a maximum of 2 innovation awards per applicant and year.
- The KETs pilot line funding serves to implement research results in a pilot line. The aim is to achieve industrial production maturity. It should be noted that investment in the line is only funded through depreciation during the
- By promoting the employment of InnoExperts, the recruitment and employment of highly qualified personnel is supported. These can be, for example, university graduates, young scientists, researchers or engineers.

In this way, the innovative strength and competitiveness of small and medium-sized enterprises (SMEs) in Saxony in particular are to be strengthened. As a rule, personnel expenses are funded for up to 30 months with a funding rate of 50%.

- The InnoTeam program supports cooperation between small and medium-sized enterprises and universities or research institutions in the formation of competence teams. Funding is provided for InnoTeams with three to twelve members, each of whom has a degree in economics, natural sciences or engineering. Applicants receive a grant of up to 100 percent of the eligible expenses for each position created, depending on the funding level and the size or form of the enterprise, over a period of usually 36 months.
- Funding for a transfer assistant supports the recruitment and employment of persons with relevant professional experience in science or business. Transfer assistants have the task of supporting SMEs through information and advisory services in the identification and planned transfer of technological knowledge from technology providers for the preparation and realization of product or process innovations or to prepare research results from science for industry. Funding is provided for personnel expenses for up to 48 months with a funding rate of 50%.

9.PIANO NAZIONALE DI RIPRESA E RESILIENZA

The Italian national COVID-19 recovery plan is called Piano Nazionale di Ripresa e Resilienza (PNRR) and it is aligned with the European Next Generation EU (NGEU) programme to facilitate Recovery and Resilience after pandemic. The plan consists in a set of actions on three main strategic axes: digitization and innovation, ecological transition, and social inclusion. The short-term objective is to address the economic and social disruption caused by the pandemic crisis. In the medium-long term, the Plan intends to remove structural weaknesses of the Italian economy, namely innovation, territorial, generational and gender gaps. Finally, PNRR will lead the country along a path of ecological and environmental transition.

10.ZWANZIG20 PROGRAM/INITIATIVE SMART³, FUNDING SCHEME FROM THE GERMAN FEDERAL MINISTRY OF EDUCATION AND RESEARCH

Eastern Germany has outstanding economic and scientific expertise. The program "Zwanzig20 - Partnership for Innovation" systematically expands these for the future. With "Zwanzig20 - Partnership for Innovation", the German Federal Ministry of Education & Research (BMBF) has added a new approach to the “Enterprise Region” funding programs, which is aimed at supra-regional, inter-, trans-and multidisciplinary collaborations between partners and stands for openness and transparency. Those are the main gaps which had to be addressed by means of a program.
The Zwanzig20 program, which is endowed with up to 500 million euros, is designed to systematically expand the outstanding economic and scientific competencies built up in eastern Germany for the future through cross-regional and interdisciplinary collaborations. The aim is to overcome boundaries in thinking, as well as boundaries of technologies, scientific disciplines, industries, markets and organizational cultures. The aim is to identify future issues with high social and economic relevance and to develop concrete, economically viable solutions for them. One of the Zwanzig20 funded projects consortia is the smart³ initiative focusing on a paradigm shift in innovations through smart materials.

The instrument is focused on a network and cluster building approach and alliances of a new kind. Zwanzig20 requires project consortia to strategically network and position themselves across all eastern German states with one or more partners from western Germany and beyond, including at the international level. To this end, the funded consortia have initiated new, open and reflexive processes of network management and forced the establishment of new kinds of innovation structures.

11.MANIFESTAZIONE DI INTERESSE REGIONE LOMBARDIA E UNIOCAMERE

The regional initiative Manifestazione di Interesse per lo sviluppo di filiere produttivi ed ecosistemi industriali in lombardia will support projects aimed at:

- enhancing and consolidating the productive chains, services and industrial, productive, and economic ecosystems existing in Lombardy
- identify new supply chains and new ecosystems emerging in the region
- stimulating business combinations and synergies by encouraging the exchange of skills and the achievement of common objectives for consolidation and development of industrial ecosystems and supply chains
- innovate and improve the quality of the production process of the supply chain and increase the competitiveness and attractiveness of industrial, productive, and economic sectors and ecosystems on national and international markets

Priority areas for project proposals where CEUP2030 CAMI4.0 topics could be involved are sustainability and circularity, innovation and technology transfer, digitization, research and intellectual property and training.

12.S3 STRATEGY(ITALY)

The Smart Specialization Strategy (S3) of Lombardy Region for the period 2021-2027 continues the path taken with the previous 2014-2020 of declination of an "integrated trajectory" of development of its territory. The objective is the identification of areas of competencies and innovative potential priorities in terms of industrial transformation and resilience of the Lombardy economic and productive system, as well as emerging technological areas to focus regional investment over the next seven years. In particular, the priorities of Lombardy identified on Advanced Manufacturing related to Smart Materials are:

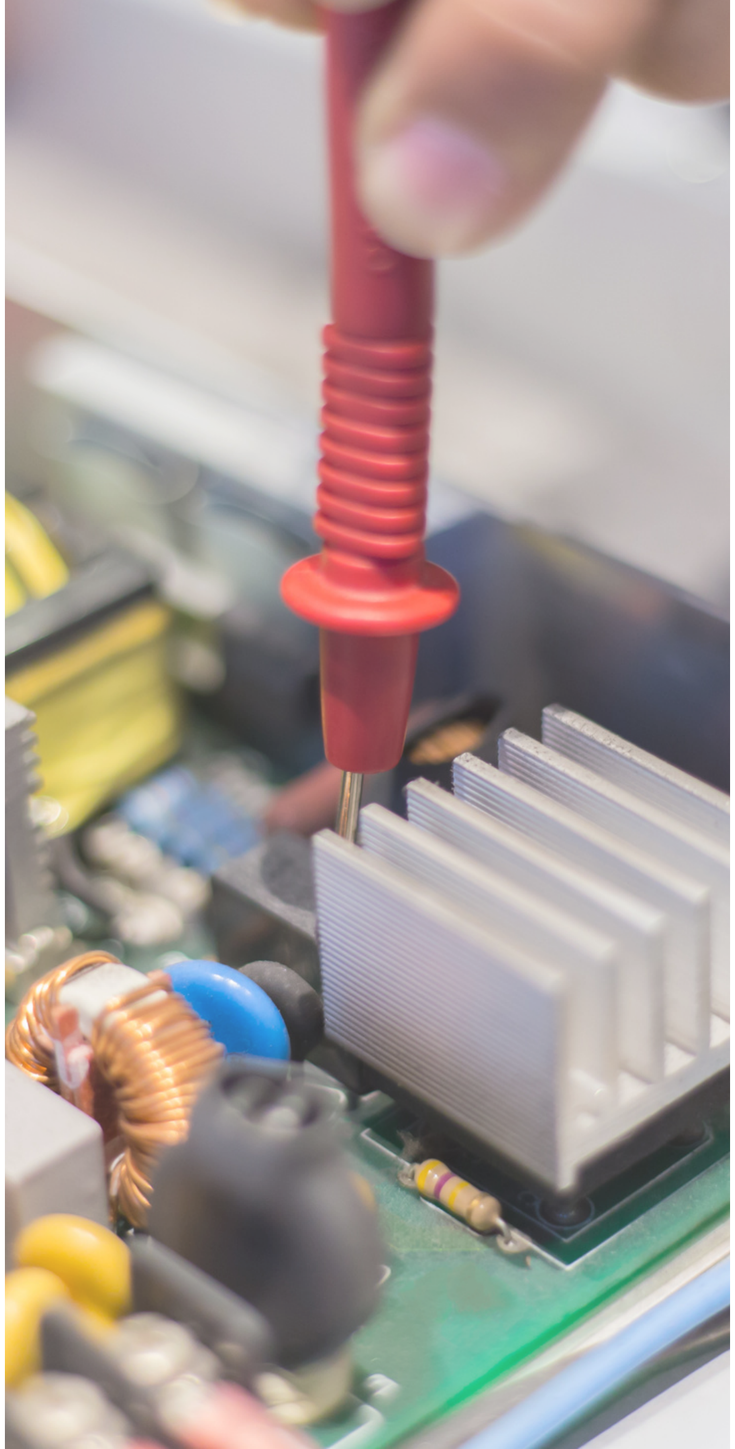
- Developing production technologies and validating advanced materials/ smart materialsà SM flagship and related activities
- New tools and technologies for industrial design, co-design, and end customer interaction.

13.PUBLIC TENDER FOR THE PROMOTION OF LARGE INVESTMENTS FOR HIGHER PRODUCTIVITY AND COMPETITIVENESS IN THE REPUBLIC OF SLOVENIA

The purpose of the public tender is to encourage companies to sustainably invest by investing in more advanced technology and automation of business processes, which will contribute to decarbonization and green and digital transition and enable greater productivity in the long run, better recovery, resilience, growth and competitiveness.
The aim of the public tender is: raising the productivity and long-term competitiveness of companies while ensuring sustainability or decarbonization or decarbonization and digitalization of operations, higher added value of products and services in Slovenian exports and higher positioning of Slovenian companies in global value chains, maintaining higher value-added jobs, strengthening global and local value chains and increasing the competitiveness of links in supply chains, more even regional distribution of investments.

14.SLOVENIAN SUSTAINABLE SMART SPECIALIZATION STRATEGY (S5)

The Smart Specialization Strategy is the basis for the implementation of European cohesion policy in the programming period 2021-2027 and is linked to investments within Policy Objective 1 - Smart Europe. In the first half of 2020, the Government Office for Development and European Cohesion Policy started the renovation of S4. The activities were mainly focused on the renewal of the necessary analytical bases and the revitalization of the business discovery process (EDP). Slovenian Sustainable Smart Specialization Strategy (S5) for the period up to 2030
In the programming period 2021-2027, the new Smart Specialization Strategy in Slovenia set the goal of a green transition, which we understand as "innovative, low-carbon, digital and knowledge-based transformation of the economy and society.
As a central issue for recovery from the pandemic, he emphasizes that the transition to a low-carbon circular economy is not only an environmental necessity, but is becoming an increasingly important factor in ensuring long-term productivity growth and resilience of the economy and society. The economic recovery from the covid-19 crisis will thus be closely linked to the goals of significantly reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels and achieving climate neutrality by 2050. The 2021 Productivity Report thus proposes guidelines for a successful transition to the new normality, followed by the S5 concept, namely: (i) staff development and future skills, (ii) the role of public finances in promoting smart, digital-innovation transformation, and (iii) sustainable transformation into a low-carbon and circular economy.



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