

EACN Strategy

**including Partnership Agreement,
Cluster Collaboration Opportunities,
EACN Roadmap and Marketing Plan**

Deliverable 2.2

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About the ‘EACN for Joint Industrial Modernisation Investments’ project

The EACN for Joint Industrial Modernisation Investment project (EACN project) has been submitted by eight members of the European Automotive Cluster Network to the Call for Proposals COS-CLUSTPARTNS-2017-3-02. It has been selected for co-funding by the COSME programme of the European Union under the Grant Agreement 821989.

Project partners are Pôle Véhicule du Futur (coordinator, France), Galician Automotive Cluster Foundation CEAGA and Catalonian Automotive Industry Cluster CIAC (Spain), Silesia Automotive & Advanced Manufacturing Cluster SAAM (Poland), Automotive Cluster Bulgaria and Automotive Cluster Serbia, with the support of Automotive-bw and Bayern Innovativ (Germany). The project lasts from October 2018 to October 2020.

The project aims at initiating common R&D and Joint Investment projects between members from different European countries in the field of industrial modernization in the automotive industry, with emphasis on Virtualisation of planning processes, (2) Robotics and Artificial Intelligence, (3) Elasticity of production processes and (4) Skills and Competences.

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Document authors

	First name Last name	Partner
Key author	Luk Palmen, Eva Dudzic, Łukasz Górecki	SAAM
Further authors	Thomas Röhr	PVF
	Clotilde Nadé	PVF
	Josep Nadal	CIAC
	Clàudia Bas	CIAC
	Carolina Trinidad	CIAC
	Borja Dapena, PhD	CEAGA
	Patricia Solá	CEAGA
	Miglena Miteva	ACB
	Lyubomir Stanislavov	ACB
	Igor Vijatov	ACS
	Aleksandar Šaranac	ACS

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Abbreviations

AI	Artificial Intelligence
BEV	Battery Electric Vehicle
CPS	Cyber-Physical Systems
EACN	European Automotive Cluster Network
ERP	Enterprise Resource Planning
EV	Electric Vehicle
FCEV	Fuel Cell electric Vehicles
GBP	British pound sterling
GDP	Gross Domestic Product
HEV	Hybrid Electric Vehicle
ICT	Information and Communication Technologies
IoT	Internet of Things
IT	Information Technologies
M2H	Machine-to-Human
M2M	Machine to Machine
MES	Manufacturing Execution System
MM	Millions
OEM	Original Equipment Manufacturer
OT	Operational technologies
PLC	Programmable Logic Controller
R&D	Research and Development
SCADA	Supervisory Control And Data Acquisition
SME	Small and Medium Enterprise
UK	United Kingdom
WP	Work Package
WTO	World Trade Organisation



1 Introduction

The European automotive industry is one of the most performant ones in the world, and the sector is crucial for Europe's economy¹. 12.6 million people - or 5.7% of the EU employed population – worked in the sector in 2017, and the 3.3 million jobs in automotive manufacturing plants represented almost 11% of EU manufacturing employment. Motor vehicles accounted for almost €396 billion in tax contributions in the EU15. The sector is also a key driver of knowledge and innovation, representing Europe's largest private contributor to R&D, with more than €50 billion invested and about 6,000 European patents granted annually. And finally, the automotive industry generated in 2017 a trade surplus of about €90 billion for the EU.

Since more than a decade one can observe increased interactions between companies of different levels in global automotive value chains, including mergers and acquisitions, and also companies from other sectors entering into projects with automotive companies. These new partnerships put pressure on SMEs in European regions, as they have to enter into technology advancement while remaining cost competitive and flexible enough to meet the requirements of their clients. The ongoing industrial modernisation process is a chance for SMEs to improve their competitiveness. Key enabling technologies in production processes in automotive play an important role in improving resource efficiency, process efficiency and boosting product innovations. But at the same time, it is a challenge for SMEs, as they have to make strategic choices that impact on business models and competencies. SMEs are reluctant towards investment processes that go beyond the current business models scoping mainly on project-to-project investment decisions.

The EACN initiative underwrites the need for supporting the integration of digital technologies to foster manufacturing processes. Although learning processes on regional level are of major importance for companies' competitiveness improvement, there are several issues related to industrial modernisation that demand for an interregional approach because of their enormous impact on traditional business models and the way value chains in automotive will be shaped in the next 10 years. The EACN Partnership identified the need to intensify cross-regional cooperation with a specific focus on making better use of clusters and fostering industrial modernisation. The main goal of the EACN Partnership is to bring together companies, especially SMEs, from the European automotive sector in order to identify similar problems and needs, define common issues and initiate innovation and investment projects and common purchasing activities related to industrial modernisation. This approach will allow the sharing of development costs as well as of risks, but also create closer relationships between the actors as basis for further cooperation.

The Cluster Partnership Strategy for Industrial Modernisation Investments in Automotive presented in this document is in line with the idea behind the Smart Specialisation Platform on Industrial Modernisation and Investment, as such will contribute to the development of common investment projects across and between regional value chains, identify barriers to innovation and investment related to industrial modernisation and address strategic competencies development.

¹ ACEA European Automobile Manufacturers' Association (2018): Safeguarding auto industry competitiveness, amidst Brexit and CO2 policy concerns, <http://www.acea.be/press-releases/article/safeguarding-auto-industry-competitivenessamidst-brexite-and-co2-policy-con> [14/02/2018]

2 Main challenges for SMEs in the European Automotive Industry

The global automotive sector finds itself at the crossroad of disruptive changes, in terms of new technologies, new production methods, as well as new mobility business models. China is taking over the role of global technology leader in electric vehicles and autonomous vehicles supported by advancements in battery technologies and 5G networks. Trans-European value chain networks are about to be shaken up as OEMs choose for standardisation by way of introducing mega-platforms, simplification and light-weight solutions, at the same time increasing the amount of IoT features in the customer's value package. Climate issues and regulations on emissions and waste force OEMs to redefine their medium and long-term strategies, including the resignation of certain traditional fuel engines by 2040. In the meantime, digitalised production systems in the automotive industry allow OEMs to better communicate with suppliers and clients, to improve time-to-market for vehicle concepts that are responding quicker to changing client's expectations and to cope with the lack of skilled workforce on the European labour market. Over time the fourth industrial revolution will contribute to the creation of a more integrated world with autonomous production facilities and intelligent data gathering, processing and decision-making systems. However, in the short term it will demand for substantial investments and difficult decisions about new business models from the part of SMEs.

A survey among 20 SMEs from six automotive clusters provided in January 2019² showed that depending on the position of the specific SME in the European automotive value chain, trends are assessed as a threat or an opportunity. One way or the other, SMEs should monitor signals related to the following situations:

- ❖ Decreasing demand for vehicles in Europe resulting in a reduction of the amount of OEM production plants in Europe and consolidation of activities in selected regions. SMEs should:
 - Monitor decisions of OEMs and Tier 1 suppliers in their region
 - Diversify within the automotive sector by way of increasing the amount of clients
 - Be ready for medium and small series production of components
 - Be ready for larger orders (cooperate or merge with other companies)
 - Propose solutions that create additional value (features and functionalities)
- ❖ Increasing pressure on margins at all levels of the value chain. SMEs should:
 - Focus on continuous improvement
 - Apply virtual planning methods to verify opportunities for cost reductions and improved flexibility of production infrastructures
 - Implement ICT solutions for data collection and processing in order to identify hidden costs and provide prevention measures
 - Verify possibilities for automation and integration of production processes by way of introducing new production technologies
 - Take up a pro-active growth policy including focus on R&D in cooperation with clients
- ❖ Increasing focus on improving customers' experiences by way of introducing new features and functionalities through cooperation with new suppliers, but at the same time limiting the number of platforms, standardising components and redefining cooperation with suppliers of traditional components. SMEs should:
 - – being a supplier of standardised components and systems – focus on cost optimisation and cost-efficient production systems

² See Deliverable 2.1: Drivers and motivators for industrial modernisation in the Automotive Industry

- – being a supplier of features and functionalities – focus on R&D, innovation project management and efficient communication with their clients
- Be prepared for an increased amount of small orders of higher added value (integrated components, functional components)
- Apply virtual planning methods to verify the technological and economic feasibility of new projects
- Optimise production systems with special focus on flexibility to cope with a larger amount of small orders
- ❖ Increasing appearance of sensors and IoT in traditional metal and plastic components and a focus on lightweight materials to compensate additional weight of electronics and batteries in electric and autonomous vehicles. SMEs should:
 - Focus on cost optimisation and cost-efficient production systems including advanced robotics; invest in production technologies for multi-material smart components
 - Be prepared for quality and security requirements at all levels of the organisation (clean production, safe data transfer, product traceability, quality control at all stages of the production process)
 - Gain competencies in new materials and new joining and bonding technologies
- ❖ Increasing role of game-changers (among which start-ups) delivering new mobility solutions and increasing pressure on suppliers to participate in OEMs' innovative projects and to take up an important part of the financial and technology risk. SMEs should:
 - Be prepared for a diversification of the product focus, scope on strategic competencies that can be applied in several product areas
 - Calculate the risk of participating in projects and prepare personnel for engagement in product development and demonstration projects
 - Be prepared for new competitors and price pressure
 - Invest in flexible production systems allowing to cope with the production of components for functional vehicles and for dedicated mobility projects
- ❖ Increasing pressure on suppliers to take into account environmental issues: energy management, circular economy, emissions, renewable and eco-friendly materials as well as new lightweight materials and their recycling process. SME should:
 - Get acquainted with new materials
 - Focus on continuous improvement of environmental management issues: energy, emissions, material recuperation, material saving
 - Invest in production systems that use less energy, allow to minimize scrap and cause minimum emissions
- ❖ Increasing shortage of skilled people on the European labour market. SMEs should:
 - Apply virtual planning methods to verify which operations can be integrated and further automated
 - Cooperate with machine suppliers on the integration of operations and development of new production technologies
 - Provide automated processes and robots in order to engage employees in activities with higher added value for the company
 - Increase the use of information management systems and smart data gathering and processing on machine level in order to set and optimise production processes without the human interference
 - Develop HR policies to strengthen employees' loyalty towards the company and to improve employees' competencies

For the period 2019-2021 SMEs that took part in the EACN survey in January 2019³ foresee the following strategic priorities (listed in order of importance):

- ❖ Introduction of improved or new relations with customers
- ❖ Introduction of improved or new products
- ❖ Focussed market expansion
- ❖ Introduction of improved or new production processes
- ❖ Improving profitability through introduction of products with higher value added
- ❖ Improving profitability through investment in monitoring and data management systems
- ❖ Improving profitability through traditional continuous improvement programs
- ❖ Introduction of improved or new logistic processes
- ❖ Providing organisational restructuring in view of expected growth
- ❖ Introduction of improved or new relations with suppliers

While considering providing industrial modernisation investments, these SMEs expect the following impacts related to the four topics covered by the EACN initiative:

- ❖ Virtualisation for planning processes (simulation and modelling)
 1. Reduction of time-to-market for new products
 2. Increase in revenue
 3. Overall reduction of costs per unit produced
 4. Overall reduction of downtime costs
 5. Overall productivity increase
- ❖ Robotics & Artificial Intelligence in production processes
 1. Increase in revenue
 2. Overall productivity increase
 3. Specific productivity increase concerning automated production operations previously done manually
 4. Reduction of costs of quality
 5. Overall reduction of costs per unit produced / Overall reduction of downtime costs
- ❖ Elasticity (flexibility) of production processes
 1. Increase in revenue
 2. Overall productivity increase
 3. Reduction of stockholding costs
 4. Overall reduction of downtime costs
 5. Increase of number of products produced in a shorter time frame for a specific part of the production process / Overall reduction of maintenance costs
- ❖ Employees' competencies (data-analytics and Human-Machine cooperation)
 1. Overall reduction of maintenance costs
 2. Increase in revenue
 3. Overall reduction of costs per unit produced
 4. Overall reduction of downtime costs
 5. Reduction of costs of quality

The above shows that the “WHY?” question concerning the added value or benefit of industrial modernisation projects for SMEs has been clearly answered. Nevertheless, one should take into account that SMEs are still reluctant about these kinds of investment projects because:

- ❖ There is a lack of standards concerning interface technologies that enable full integration of machines and processes in a single integrated network for data collection, data analysis and

³ See Deliverable 2.1: Drivers and motivators for industrial modernisation in the Automotive Industry

performance improvement. Because of the lack of turn-key solutions, most projects have to be tailored to the specific conditions in the company, resulting in higher investment costs.

- ❖ There is a lack of competencies to analyse data and a lack of readiness on the level of the SME owner or the board to decentralise decision making processes.
- ❖ There is a fear for “overinvesting” in infrastructure and systems that cannot be “laid-off” in times of economic stagnation or recession and also a fear for reactions from workers, when the idea of industrial modernisation is linked with the laying-off of employees.



3 Mission

Although large multinationals play a major role in traditional automotive value chains, the role of SMEs and outsiders in new business models in automotive is increasing due to trends in e-mobility, autonomous cars, circular economy and climate change as well as ecological consciousness and new life habits among end-users. Traditional supplier relationships and production models are undergoing severe pressure. New technologies allow meeting diverse customer expectations. Car model life cycles are shortening. In a capital-intensive industry like automotive, SMEs are facing the challenge to make the right decisions concerning the uptake of new technologies in the fourth industrial revolution, at the same time considering new business models. The EACN Project Partners see opportunities in interregional learning and cooperation as a means to support the change processes related to industrial modernisation, enhancing the potential for competitive production processes and improving companies' position in the global automotive value network.

Taking into account the above, the mission of the EACN Project Partners is *“to guide SMEs in Automotive in industrial modernisation processes by identifying opportunities for change, sharing good practices, enabling contacts with solution providers and delivering expert support in investment project and collaboration project preparation”*.

It is the aim of the EACN Project Partners to invite additional clusters and European thematic networks to develop an EACN Partnership on a wider base.

4 Vision 2020

The EACN Partnership Strategy for Industrial Modernisation Investments in Automotive will be a well-known platform for European SMEs in Automotive and technology suppliers in order to stimulate cross-sectoral project development, joint investments and a wider application of solutions for industrial modernisation in SMEs. Supported by an online idea and project development platform and a repeatable matchmaking approach through online thematic seminars and matchmaking events, the EACN Partnership will have developed a first set of at least 5 project proposals for a minimum value of 7 MM euro in which at least 15 companies are engaged.

5 Overall strategic goals

The aim of the European Partnership for Industrial Modernisation Investments in Automotive (also “The Partnership”) within the European Automotive Cluster Network is to bring together experience and expertise in industrial modernisation from different stakeholders – including SME’s and large companies in Automotive, research and development centres and science and technology parks, as well as technology and integrated solution suppliers – in order to:

1. Raise awareness among SME’s in automotive on the need to enter into industrial modernisation;
2. Share good practices about scalable solutions for industrial modernisation among SME’s;
3. Work together on defining needs and potential solutions for industrial modernisation in SME’s;
4. Promote interregional cooperation between cluster members of different European regions in the framework of investment projects and collaboration projects on industrial modernisation;
5. Promote interregional cooperation between regional authorities in order to streamline policies and support measures for industrial modernisation.

6 Strategic focus

Based on an analysis of drivers and motivators for industrial modernisation, a survey among SMEs and a set of workshops in six clusters, the following strategic focus was defined.

6.1 Virtualisation for planning processes (simulation and modelling)

Definition

Virtualisation for planning processes (simulation and modelling) allows creating a digital copy of a production facility by incorporating sensor data acquired from monitoring physical processes and equipment with virtual models and simulation models. The virtualisation enables plant managers, team-leaders and operators on the shop floor⁴ to better manage growing complexity, reduce equipment downtime and optimize processes. The imitation of real-world processes over time is achieved by adoption of tools such CAx, Factory Layout design, Material and Information flow design, Manufacturing Networks Design, Manufacturing Systems Planning and Control, Manufacturing Networks Planning and Control, Augmented and Virtual Reality in product and process design, planning and verification⁵.

Target group

Especially companies dealing with several clients and several projects – often short-term contracts or small-series productions – at the same time could benefit from an integrated approach including virtualisation applications and flexible production systems. In the workshop provided in March 2019 SMEs underlined the need for integrating new technologies in traditional ERP, developing a cloud platform for digital twins' applications and creating low cost solutions for applying smart glasses in production processes and in remote communication processes with clients and suppliers.

Strategic focus

Within the EACN initiative the strategic focus will be on the following issues:

- ❖ **Vertical integration (virtualisation of processes**, analysis of H2M and M2M solutions in new configurations to improve efficiency and ergonomics) – integration of processes and systems across all levels in the organisation to establish a connected, end-to-end data thread that permits seamless data exchange, analysis, and decentralised decision-making by machines (processes of data storage, data exchange and data use – including the role of PLC, SCADA, MES, ERP in the integrated system, interoperability and communication between subsystems and physical devices)
- ❖ **Digital twins** (*virtualisation of the production plant – with specific focus on tailored low cost solutions for SMEs, for example digital twins cloud platforms that could be accessed by several SMEs*), applications for modelling production processes (*especially for what concerns: flexible workstations and the improvement of ergonomics at such workstations; support in defining danger/safety zones when applying cobots*), inter- and intra-logistics, indoor localization in support of visualization and/or AR/VR applications
- ❖ **Virtualisation of product development processes** (*with specific focus on integrating these functions into the traditional ERP*):

⁴ Shop floor: the part of a workshop or factory where production is carried out

⁵ Mourtzis, D., Doukas, M., Bernidaki D.: Simulation in Manufacturing: Review and Challenges. Procedia CIRP, 25 (2014) 213 – 229

- Virtual prototyping and testing, digital project life cycle model (simulation applications for improved product life cycle management)
 - Integration of computer aided design (CAD), computer aided engineering (CAE), computer aided process planning (CAPP), computer aided manufacturing (CAM), computer aided quality (CAQ)
 - Visual Enterprise Manufacturing Planning Systems for preparing Engineering Bill of Materials (EBOM) and Manufacturing Bill of Materials (MBOM)
- ❖ **Human-Machine Interfaces** including touch screens, wearables, virtual reality, identification solutions (*with specific focus on: the replacement of barcodes scanning by smart glasses to select parts for assembly tasks; remote cooperation between machine suppliers and maintenance personnel in the company; remote cooperation with clients in presentations and problem solving activities; new training methodologies for employees; support in quality control of parts*)

Operational approach

The EACN initiative will build on the following experiences and good practices:

- ❖ CIAC – The elaboration of a manual on Industry 4.0 technologies for stamping. The collaborative project involved three SMEs: AUSIL Systems and ITK (suppliers) and Funcosa (industrial company). The project started with a company audit to identify the possibilities to apply a digital twin. Activities included: a full audit of the IT architecture and communications in each of the 5 layers (Sensor Actuator Hardware, PLC PD PID, SCADA, MES, ERP); preparation of a document with technical and technological specifications of the DTF platform; development of the DTF scheme with all modules and functionalities of the platform; performing an analysis of suppliers capable of providing the Twin Digital adapted to the requirements. In the second stage will involve a pilot test by way of applying the digital twin in the production company.
- ❖ CIAC – A proof-of-concept project concerning a "Machine Learning" model applied to a mechanical printing press of 1000TN with transfer and progressive process, based on the data already available with the aim to create a predictive model (predictive maintenance). The project was inspired by the Industry 4.0 technologies for stamping manual. The following organisations are involved in this project: i2cat (technology centre), Aubay (provider), Improva (SME consultant) and 6 companies including Gedia, Estamp, Meleghy (SME), Linde & Wiemann, Farguell (SME) and NISSAN as the beneficiaries. The proof of concept will be carried out in Meleghy.
- ❖ CIAC – the development of a universal platform for data collection and management. The project is led by Maccion (start-up) and will be tested in industrial companies. The aim is to reduce learning and reaction time of operators by way of delivering them real-time information about the status of specific production assets and about anticipated breakdowns. The operator will receive only those electronic documents that are necessary for the current specific production or intervention context.

The EACN initiative will invite the following university faculties, research centres and technology parks:

- ❖ PVF – CEA Tech has a platform opened to SMEs dealing with virtualisation and digitalisation of processes.
- ❖ CIAC – Eurecat, Technological Centre of Catalonia (member of TECNIO), provides modelling and simulation for design and optimisation of materials, components and processes.

- ❖ CIAC – i2CATris a non-profit research and innovation centre that promotes R&D in Information Technology and Communication and the Internet of the Future. The centre promotes a new open innovation framework, fostering collaboration between companies, the public administration, the academic environment and users.
- ❖ CIAC – LEITAT Technology Centre (member of TECNIO) offers among others services like: design and simulation of industrial products and processes and automatized fabrication and assembling and robotics.
- ❖ CIAC – Centre de Visió per Computador (CVC) is a non-profit institution founded in 1995 by the Generalitat de Catalunya and the UAB (Universitat Autònoma de Barcelona). The Computer Vision Centre is dedicated to research and development in the area of computer vision.
- ❖ CIAC – The Centre for Innovation and Technology of the Polytechnic University of Catalonia (CIT UPC) places university research at the service of innovation in companies. CIT UPC develops integral, multidisciplinary and "turnkey" technology solutions and offers a wide range of technological capabilities in advanced production technologies and ICT.
- ❖ CIAC – CRISTECH-URV is the unit of technology transfer and recovery linked to the CRISES research group of the *Rovira i Virgili* University. They are specialized in the design and implementation of efficient, secure and private solutions in the field of Cybersecurity.
- ❖ CIAC – University of Girona (UdG) is a public institution. The Polytechnic School of the University of Girona has distinguished research groups in computer vision and robotics, virtual reality, artificial intelligence and control and conceptual design.
- ❖ SAAM – the Silesian University of Technology has an augmented reality demonstrator in the Centre of New Technologies. There are several research groups at the university dealing with virtualisation technologies.
- ❖ SAAM – the University of Bielsko-Biała has a research group specialised in virtualisation of production plants and production processes.

Start-ups active in the cluster ecosystem:

- ❖ PVF – INEVA is an engineering and test centre that provides advanced skills and numerous equipment for measurement and characterisation.
- ❖ PVF – 4-iTech initiative was borne of the PIA PIAVE Factory of the Future call for projects. 4-iTech aims at creating innovative solutions for the industry to improve the factories' productivity. It is a structured environment in plateau that allows the pooling of needs and the sharing of the costs of studies and development. The areas of expertise are on the scale of TRL 4 to 9 which starts after the proof of concept and goes as far as industrialisation, marketing and maintenance of installed equipment.
- ❖ CIAC – Maccion is dedicated to the implementation of Industry 4.0 solutions and is specialised in IoT sensors and systems to capture the events in the factory and to integrate devices and platforms. The company supports industrial companies in the Industry 4.0 change process and the digitisation of the plant.
- ❖ CIAC - TheThings.io is an IoT platform for companies to deploy scalable and flexible IoT solutions for their customers and connected products. The platform enables fast and scalable connection of things to the Internet, allowing to monitor and manage the devices in real-time and to receive flexible analytic reports. It allows to create dashboards and control panels for final customers with customised brand styles and URLs of the company. With these dashboards, customers can monitor, analyse or interact with the products.
- ❖ CEAGA – AR-VR Meifus is a start-up centred on the creation of interactive manuals of virtual and augmented reality for maintenance work on machines.

- ❖ CEAGA – DTView 3D is a recent company that created virtual, augmented and mixed reality glasses to see the interior of machines, processes, designs or factories with a high level of detail.

6.2 Robotics & Artificial Intelligence in production processes

Definition

Robotics - Inclusion of robotics in production processes allows performing duties that are dangerous or unsuitable for human workers. Robots are defined as reconfigurable automation technologies characterised by being automatically controlled, reprogrammable, multipurpose manipulators programmable in three or more axes⁶. Attempts to reaching ever higher levels of automation the interaction between human and machines has brought up new forms of human-machine interaction with cobots: collaborative robots which are more flexible and capable of learning and interacting hand-in-hand with humans using human-machine interfaces.

When we talk about collaboration, we talk about the action of working with someone to produce something. In the case of robotics, what really defines this collaboration is the behaviour of the robot during this interaction. According to ISO 10218, Parts 1 and 2, the following types of collaborative characteristics are associated with robots:

- ❖ Monitored stop: the robot surrounded by a closed area works individually. However, occasionally human access is allowed to do a specific task during which the robot is inactive. When the operator has left the protected area the robot will continue its task. This was the most common application of industrial robots in the past.
- ❖ Handwriting: useful for "pick and place" systems, for example. The robot is equipped with a sensor to his wrist that detects the forces of the human hand guiding him to the required position during the training phase. The robot is inside a closed area and the collaboration is given only during training. It can be a standard industrial robot equipped with a sensor of detection of forces on the wrist and the appropriate software.
- ❖ Speed and distance monitoring: the robot has some zones programmed in a way which reduces or increases its speed depending on the presence of a human. The robot would get to stop safely in front of an excessive proximity. It can be a standard industrial robot with an artificial vision system; applies to shared environments with humans.
- ❖ Limitation of power and strength: the robot is in more rounded forms, in order to facilitate the dissipation of energy in case of impact, and usually works at reduced speeds. The robot is able to detect external forces in its path and stop if they are excessive. This is not a standard robot, it requires strength limitation features, does not require security elements but a risk analysis.
- ❖ Detection of forces: we associate it by defect with a collaborative robot. External forces applied are detected by sensors in each of the axes of the robot. Marketed as safe, of rounded shapes, made of soft materials (such as skins), compact and lightweight. They are very interesting for their ease of programming and integration.

"Cobot" is a word of jargon, referring to collaborative robots. It is often used to identify robots with detection of forces features, even if there are robots without this feature that, through other features, collaborate with the human being at different levels. The robot with force detection is the one that most quickly associates with a collaborative robot. They are equipped with sensors for detecting forces on all axes and are usually equipped with other systems such as artificial vision cameras or software for several training applications which try to facilitate their programming and

⁶ https://www.sciencedaily.com/terms/industrial_robot.htm [12.12.2018]

integration in the productive environment. This allows programming the robot to stop or even move in the opposite direction. Also, it allows guiding by hand with the advantage of being intrinsically safe. It is about making them compatible with human beings, so that they can interact by releasing, for example, repetitive tasks that do not add any value. It is often sought to be mobile, low-weight, some with wheels and with axle controller integrated, so that they can be placed in a new position and make them work immediately after a quick and simple training phase.

Artificial Intelligence (AI) – the significance of the AI in the manufacturing process lies in a broad range of its applications. AI enables machines to learn from experience, adjust to new inputs and perform human-like tasks and allows manufacturer to analyse the data generated by factories, operations and consumers and transform them into decisions⁷. Quality management, predictive maintenance and supply chain optimization are among the most promising immediate opportunities for applying AI in production systems⁸. 44% of Forbes Insights survey respondents coming from automotive and manufacturing sectors considered AI as “highly important” to the manufacturing function in the next five years, while almost half – 49% – said it was “absolutely critical to success”⁹. In respect to the automotive sector, McKinsey defined three levels of AI: (1) narrow AI, the current state-of-the-art with existing software that automates a traditionally human activity and often outperforms humans in efficiency and endurance in one specialized area; (2) general AI/human-level AI describes the capacity of machines to understand their environment and reason and act accordingly, just as a human would in all activities across all dimensions, including scientific creativity, general knowledge, and social skills; (3) Super AI is reached when AI becomes much smarter than the best human brains in practically every field. Super AI systems can make deductions about unknown environments¹⁰.

Target group

Rather medium sized companies than small companies. Robotics still is seen as something expensive with longer pay-back time and as such related to a higher investment risk. Automotive SMEs facing low margins in their contracts do not have the financial capacity to invest in such equipment. SMEs applying older machines that have doors on the side and are not able to place and pick parts from the top of the machine, do not see the possibility to use Cartesian robots that theoretically could help to optimise space and optimise the internal logistical process. Potential applications of cobots are considered in sorting and packaging activities.

Strategic focus

Within the EACN initiative the strategic focus will be on the following issues:

- ❖ **Production** - interactive robotics, autonomous robotics, flexible and reconfigurable machinery and robots, easy programmable cobots for production tasks, robots and automated systems for pick and place of parts in an automated warehouse system, robots and modules for delivering tools and parts to the assembly work station
- ❖ **Space efficiency** – cobots and manipulators as a way to better organise the shop floor
- ❖ **Computer supported quality control** (visual technologies, neuronetworks, deep learning)

⁷ https://www.sas.com/en_nz/insights/analytics/what-is-artificial-intelligence.html [12.12.2018]

⁸ Technology and Innovation for the Future of Production: Accelerating Value Creation, World Economic Forum, March 2017

⁹ <https://www.forbes.com/sites/insights-intelai/2018/07/17/how-ai-builds-a-better-manufacturing-process/#fa3f53a1e842> [12.12.2018]

¹⁰ Artificial Intelligence – Automotive’s New Value-Creating Engine, McKinsey Center for Future Mobility, McKinsey&Company, January 2018

Operational approach

The EACN initiative will build on the following experiences and good practices:

- ❖ CIAC – AUTO-TRACEABILITY ENGINE. The project was done by NISSAN with the support of Gedia, Bosch and Continental. The main objective was to improve traceability solutions for the in-line engine through the application of collaborative online robotics, with coexistence of operators, creating a robotic traceability cell. This project was assigned to three companies: ABB (provider), Feedbackground (SME consultant) and NUTAI (SME engineering). A demonstrator was prepared that demonstrated the adaptation and integration of the incorporated technologies, mainly collaborative robotics and robust detection of 1D (barcodes) and 2D codes (QR), including: the robust reading of the labels, the transfer of the readings of the codes to the corresponding fields, the recording of the complete traceability record that is derived (for each motor set) and the complete architecture necessary to meet the needs of the client.
- ❖ CIAC - Detection of leaks in the air conditioning circuit. The project was done by NISSAN with the support of Gedia, Bosch and Continental. The main objective is to perform inspection of potential leakages in the air conditioning circuit with a Cobot, using 2 types of detection equipment, depending on whether it is freon or helium. Taking into account these gasses the prepared solution should be integrated in a secure and collaborative environment in which several operators work. The application must be integrated in a secure and collaborative environment, because it is an inspection area where several operators work. This project was assigned to three companies: KUKA (provider), Eurecat (technology centre) and Wetrion (SME engineering).
- ❖ CIAC – Quality verification of pieces through Deep Learning, polarization and deflectometry technologies combined with robots in Intercontinental. The working group formed by Universal Robots (collaborative robot manufacturer), Infaimon (specialist in artificial vision solutions) and Webocots (collaborative robot integrator) is working on a solution concerning the detection of surface failures of complex geometry parts to better address the problem of aesthetic or superficial surfaces' failure detection.
- ❖ CEAGA – Unimate Flexible Mobile Robot, a start-up born in the Business Factory Auto (BFA), has created a Robotic school because of the enormous requests from its clients to train employees in new competencies.

The EACN initiative will invite the following university faculties, research centres and technology parks:

- ❖ PVF - CEA Tech has platform on several projects of automatisaton of production lines, but also proposes cobotic solutions centred on simple assembly operations, on checks and on packaging.
- ❖ CIAC – i2CATris a non-profit research and innovation centre that promotes R&D in Information Technology and Communication and the Internet of the Future. The centre promotes a new open innovation framework, fostering collaboration between companies, the public administration, the academic environment and users.
- ❖ CIAC – LEITAT Technology Centre (member of TECNIO) offers among others services like: design and simulation of industrial products and processes and automatized fabrication and assembling and robotics.
- ❖ SAAM – Silesian University of Technology has an autonomous robots demo-lab at the Faculty of Mechanical Engineering.
- ❖ SAAM – Omron (Cluster member) has a Demo-Lab and Testing-Lab on autonomous mobile robots (AGV).

Start-ups active in the cluster ecosystem:

- ❖ PVF – MCRobotics is a start-up specialised in robotics who has created its own robotic software to manage more easily the robots, in real time or via the 3D simulator.
- ❖ CEAGA – Unimate Flexible Mobile Robot is a start-up born in the Business Factory Auto (BFA) that creates robots with vision system and technology of AGVs (automatic guided vehicles) to move autonomously through the plant.
- ❖ CEAGA –Humat is born in the Ledisson AIT group to bring the future to the production lines. Using the know-how they acquired throughout the years, programming robots in the biggest automotive producers, Ledisson AIT reinvents itself and gives birth, with the help of robotics technology, to Humat Robotics. They specialise in turn-key projects that solve problems in the production lines that were impossible to solve with conventional robotics
- ❖ CIAC – Maccion is dedicated to the implementation of Industry 4.0 solutions and is specialised in IoT sensors and systems to capture the events in the factory and to integrate devices and platforms. The company supports industrial companies in the Industry 4.0 change process and the digitisation of the plant.
- ❖ CIAC - TheThings.io is an IoT platform for companies to deploy scalable and flexible IoT solutions for their customers and connected products. The platform enables fast and scalable connection of things to the Internet, allowing to monitor and manage the devices in real-time and to receive flexible analytic reports. It allows to create dashboards and control panels for final customers with customised brand styles and URLs of the company. With these dashboards, customers can monitor, analyse or interact with the products.

6.3 Elasticity of production processes in SMEs

Definition

Elasticity of production processes concerns the configuration of systems in such a way that production of different products is possible without retooling, downtime is minimised, production of highly customised and unique products is provided efficiently and production capacity can be shifted between products in line with demand¹¹. Flexible production systems are composed of self-organising workstations that allow producing small lots of individualised products. Flexibility can also be achieved by organisational solutions resulting in flexibility of operating time available, flexibility of competencies and operators' skills (multi-skilled operators), as well as general flexibility of resources benefiting from sharing resources¹². A precondition for flexible production systems is the connection between all machines and the company's management system (manufacturing execution system, enterprise resource planning system, supervisory control and data acquisition system), so that information gathered from sensors can be transferred, interpreted and processed (using AI) into decisions for continuous improvements.

Target group

Especially companies dealing with several clients and several projects – often short-term contracts or small-series productions – at the same time could benefit from flexible production systems. In the workshop provided in March 2019 SMEs underlined the need for IT solutions that allows to integrate older equipment with new equipment (differences in protocols) in company management systems. In

¹¹ <https://www.uky.edu/~dsianita/611/fms.html> [13.12.2018]

¹² Flexible Manufacturing Systems: Industry 4.0 Solution, I.P. Gania, A. Stachowiak, J. Oleśków-Szłapka, Poznan University of Technology, 24th International Conference on Production Research (ICPR 2017), March 2018

addition, SMEs referred to the challenge of defining indicators and parameters for which data gathering, data transfer and data processing should take place without facing the risk of information overload. Also, cyber security was mentioned, as many companies are not able to invest in expensive cyber security solutions that are currently offered on the market, mostly for large companies. Taking into account limitations in budgets and available personnel, SMEs would like to get acquainted with step-by-step modular approaches to better integrate the machine park with production processes into flexible production systems.

Strategic focus

Within the EACN initiative the strategic focus will be on the following issues:

- ❖ **Vertical integration** – integration of processes and systems across all levels in the organisation to establish a connected, end-to-end data thread that permits seamless data exchange, analysis, and decentralised decision-making by machines (processes of data storage, data exchange and data use – including the role of PLC, SCADA, MES, ERP in the integrated system, interoperability and communication between subsystems and physical devices)
- ❖ **Integrated product lifecycle management** – integration of people, processes and systems along the product life cycle within digital tools and systems
- ❖ **Flexible production systems**, integration of multiple systems, large range of products produced in smaller batches, customization (*with specific focus on a step-by-step approach for SMEs to integrate automation systems across the company so they can interact dynamically with one another as a single integrated whole*)
- ❖ **Connectivity** – wireless data transfer within interconnected systems, interoperability of systems, open inclusive communication networks – interconnected systems to communicate with one another seamlessly (*especially for what concerns the integration of older equipment and new equipment using different protocols in one IT system*)
- ❖ **Complex security approach** – information security management systems including classification of information, authentication requirements, preventing from unauthorized access (*especially for what concerns low cost solutions for SMEs*)

Operational approach

The EACN initiative will build on the following experiences and good practices:

- ❖ PVF – Sochaux 2022, PSA is planning to restructure the Sochaux site with a huge degree of flexibility on production lines to answer fully to the elasticity of demand. On the same production line, they foresee to be able to do six different silhouettes. The project of reconfiguration of the Mulhouse site is similar, the aim is to have one sole line of production to be able to answer the elasticity of demand.
- ❖ PVF – the cluster is cooperating with start-ups that are currently involved in aeronautics and are looking for activities in automotive – tooling/tool printing and aftermarket components.
- ❖ CIAC – RFID project in Nissan. The project was launched by Nissan, with the support of 7 other industrial companies: FAE (SME), A. Raymond (SME), Bosch, Gedia, Schnellecke, Zanini and Continental. The goal is to implement RFID technology in a dedicated flow of plastic boxes between a nearby supplier and Nissan with the aim to test opportunities and restrictions of RFID technologies in industrial flows and layouts, to identify traceability opportunities and to test a first proposal of tags for the Renault-Nissan-Mitsubishi Alliance. The project was assigned to two companies: ERNI as a software application developer Track & Trace, and Maccion (SME) for the deployment of step control cells.

- ❖ CIAC – Additive Manufacturing. CIAC, considering the high potential of this new technology, decided to approach it by reaching its partners through workshops. Each workshop was constituted by four best cases explained by its performer and client, always avoiding the commercial part and focusing in the real application. Moreover, the workshops ended up with a round table chaired by an expert in the subject, in which the associates could directly ask each one of the participants and receive a direct answer from the client where the best case had been carried out.

The EACN initiative will invite the following university faculties, research centres and technology parks:

- ❖ PVF - CEA Tech has a platform opened to SMEs dealing with virtualisation and digitalisation of processes.
- ❖ CIAC – Eurecat, Technological Centre of Catalonia (member of TECNIO), provides modelling and simulation for design and optimisation of materials, components and processes.
- ❖ CIAC – LEITAT Technology Centre (member of TECNIO) offers among others services like: design and simulation of industrial products and processes and automatized fabrication and assembling and robotics.
- ❖ CIAC – The Centre for Innovation and Technology of the Polytechnic University of Catalonia (CIT UPC) places university research at the service of innovation in companies. CIT UPC develops integral, multidisciplinary and "turnkey" technology solutions and offers a wide range of technological capabilities in advanced production technologies and ICT.
- ❖ CIAC – CRISTECH-URV is the unit of technology transfer and recovery linked to the CRISES research group of the *Rovira i Virgili* University. They are specialized in the design and implementation of efficient, secure and private solutions in the field of Cybersecurity.
- ❖ CIAC – University of Girona (UdG) is of Girona is a public institution. The Polytechnic School of the University of Girona has distinguished research groups in computer vision and robotics, virtual reality, artificial intelligence and control and conceptual design.

Start-ups active in the cluster ecosystem:

- ❖ PVF – Plastiform is a SME developing and implementing unique thermoformed solutions adapted to simple conditioning solutions or to an entirely automatized environment in the context of the Factory of the Future.
- ❖ PVF – Automobiles Dangel is the first French manufacturer of commercial vehicles (4x4).
- ❖ PVF – 4-iTech initiative was borne of the PIA PIAVE Factory of the Future call for projects. 4-iTech aims at creating innovative solutions for the industry to improve the factories' productivity. It is a structured environment in plateau that allows the pooling of needs and the sharing of the costs of studies and development. The areas of expertise are on the scale of TRL 4 to 9 which starts after the proof of concept and goes as far as industrialisation, marketing and maintenance of installed equipment.
- ❖ CIAC – Maccion is dedicated to the implementation of Industry 4.0 solutions and is specialised in IoT sensors and systems to capture the events in the factory and to integrate devices and platforms. The company supports industrial companies in the Industry 4.0 change process and the digitisation of the plant.
- ❖ CIAC - TheThings.io is an IoT platform for companies to deploy scalable and flexible IoT solutions for their customers and connected products. The platform enables fast and scalable connection of things to the Internet, allowing to monitor and manage the devices in real-time and to receive flexible analytic reports. It allows to create dashboards and control panels for final customers with customised brand styles and URLs of the company. With these dashboards, customers can monitor, analyse or interact with the products.

- ❖ CEAGA – Inmake Integra is an online platform that offers an integral service for the entire process of manufacturing prototypes through additive manufacturing. It was created in the Business Factory Auto and, for now, is in an early stage.
- ❖ CEAGA – Muutech is a monitoring software platform for the collection and visualization, in real time, of data that come from the industrial environment. They offer two products: Minerva, a cloud storage and monitoring platform, and Wifra, a web interface for remote access to control the IT equipment of the entities.
- ❖ CEAGA – Norlean is a company unified value proposal based on the Lean methodology, business experience and technology to improve productivity. They work with digital twins, 3D virtualisation and improving Industry 4.0
- ❖ CEAGA - Situm Technologies develops and markets an indoor positioning platform for mobile devices that achieves maximum precision with the minimum infrastructure and the fastest deployment.

6.4 Skills and competences in industrial modernisation

Definition

Technologies such as: machine learning, big data analytics, internet of things, cloud computing, autonomous transport, new materials, augmented and virtual reality and wearable electronics are having an enormous impact on the automotive industry, from the point of view of the car as the final product as well as for what concerns the production processes at the various levels of the value chain. The introduction of cyber-physical systems in automotive and the increased use of digital technologies in production processes imposes the need for new human resources policies to cope with the development of new soft and hard skills and the shifting of employees from routine and simple tasks or dangerous tasks to more creative and responsible tasks in the factory. Information and data will be the key elements which employees will have to process in their day-to-day jobs. Available training programs focus on technical skills development in areas such as: electricity, fluid power, mechanical systems, PLC, robotics, product traceability, management and monitoring, data transfer and processing, cyber-security, simulation, data mining and machine learning, systems analysis and optimization, additive manufacturing, real time control and predictive solutions. As more and more tasks and responsibilities being transferred downwards to the workers on the shop floor, there is a need for soft skills development in areas such as: complex problem solving, critical thinking, creativity, people management, coordinating with others, emotional intelligence, judgment and decision-making, cognitive flexibility and adaptability to changing situations.

Target group

All SMEs in the automotive industry. There is no single recipe or model for implementing Industry 4.0 technologies and systems in production companies. Nevertheless, there will be a need for competencies development in the field of data collection, data interpretation, process development and monitoring as well as human-machine cooperation and human-human cooperation regardless of the activities of the given production company. Employees on the shop floor level will receive more and more responsibilities to monitor processes and intervene in case of non-conformity or a need for process optimisation. So, they will need to have insight in the whole process, to understand the impact of their activities and decisions on the product, the process and the next stages in the product life cycle. There still is a lack of awareness among SME owners and management to invest in new Industry 4.0 related skills. At the same time SMEs face lack of time to delegate employees to additional training. One has to take into account that, in contrast to large companies that often have several specialists for one task, in SMEs for most of the time one person is responsible for several

tasks. In view of the industrial modernisation change processes there is a need for a dedicated leadership program for selected SME personnel.

Strategic focus

Within the EACN initiative the strategic focus will be on the following issues:

- ❖ **Workforce learning and development** – training programs focused on competencies in data analytics, data interpretation, system integration, increased human-machine integration, machine programming (*with specific focus on a mix of technical skills development and soft skills development*)
- ❖ **Leadership competency** – management’s awareness of available technologies, management’s ability to plan and execute change processes
- ❖ **Industry 4.0 Leadership development program** (*with specific focus on dedicated training programs for selected employees responsible for production and process management in SMEs*)

Operational approach

The EACN initiative will build on the following experiences and good practices:

- ❖ SAAM – Silesian Competence Centre of Industry 4.0 (SCCI 4.0) has been involved in best-practice development, methodology and program development for Coaching Industry 4.0 Advisors and Leaders. The project focused on competence profiles and training schemes for employees responsible for industry 4.0 change processes and management in companies
- ❖ SAAM – Thematic Workgroup on Industry 4.0. This workgroup is composed of representatives of automotive companies and representatives of Industry 4.0 technology suppliers. Based on presentations of case studies, workshops are provided around a set of questions. Participants exchange their practices and then formulate common solutions and proposals for the specific topics raised in the discussions.
- ❖ CIAC – a list of Industry 4.0 competencies defined by 35 companies. In 2018 a group of 72 employees of 35 companies defined a list of competencies related to Industry 4.0 for the Technical/R&D/Engineering Department, for production, for maintenance and logistics. In total more than 40 competencies fields were considered, including technical as well as soft skills.
- ❖ CEAGA – The company Ledisson, that works with robotics, collaborative robotics and programming, has its own formation courses. The company offers these courses to their workers and externals.
- ❖ CEAGA – FIT4FoF “Making Our Workforce Fit for the Factory of the Future” (project) aims at addressing employees’ needs, analysing technology trends across 6 industrial areas of robotics, additive manufacturing, mechatronics/machine automation, data analytics, cybersecurity and human machine interaction, to define new job profiles, which will inform education and training requirements. (www.fit4fof.eu)

The EACN initiative will invite the following university faculties, research centres and technology parks:

- ❖ SAAM – EMT Systems Ltd. trains engineers and technicians working in different branches of industry. The company offers courses focused on the needs of maintenance services and designers working with CAD/CAM/CAE software. Training spectrum covers technical trainings in the field of automation, mechanics, energy, technology, design and construction.
- ❖ SAAM – Silesian Competence Centre of Industry 4.0 (SCCI 4.0)/ Digital Innovation Hub provides support at various stages of the digital transformation process to industrial SMEs

and large enterprises. SCCI 4.0 scope of activities include: awareness creation, ecosystem building, testing and validation, digital maturity assessment, project facilitation.

- ❖ CEAGA - collaboration with the University of Vigo, with the government of Galicia and with FEUGA to develop new university degrees in 2020. CEAGA consults automotive companies to identify skills.

7 Cluster collaboration value chain map

The EACN Partnership members have identified SMEs in their clusters that are facing challenges concerning industrial modernisation, as well as SMEs that have already gone through investments and change processes concerning industrial modernisation. These companies will be engaged in workshops, matchmaking events and project development activities together with suppliers and technology centres that potentially can deliver solutions in the framework of future projects.

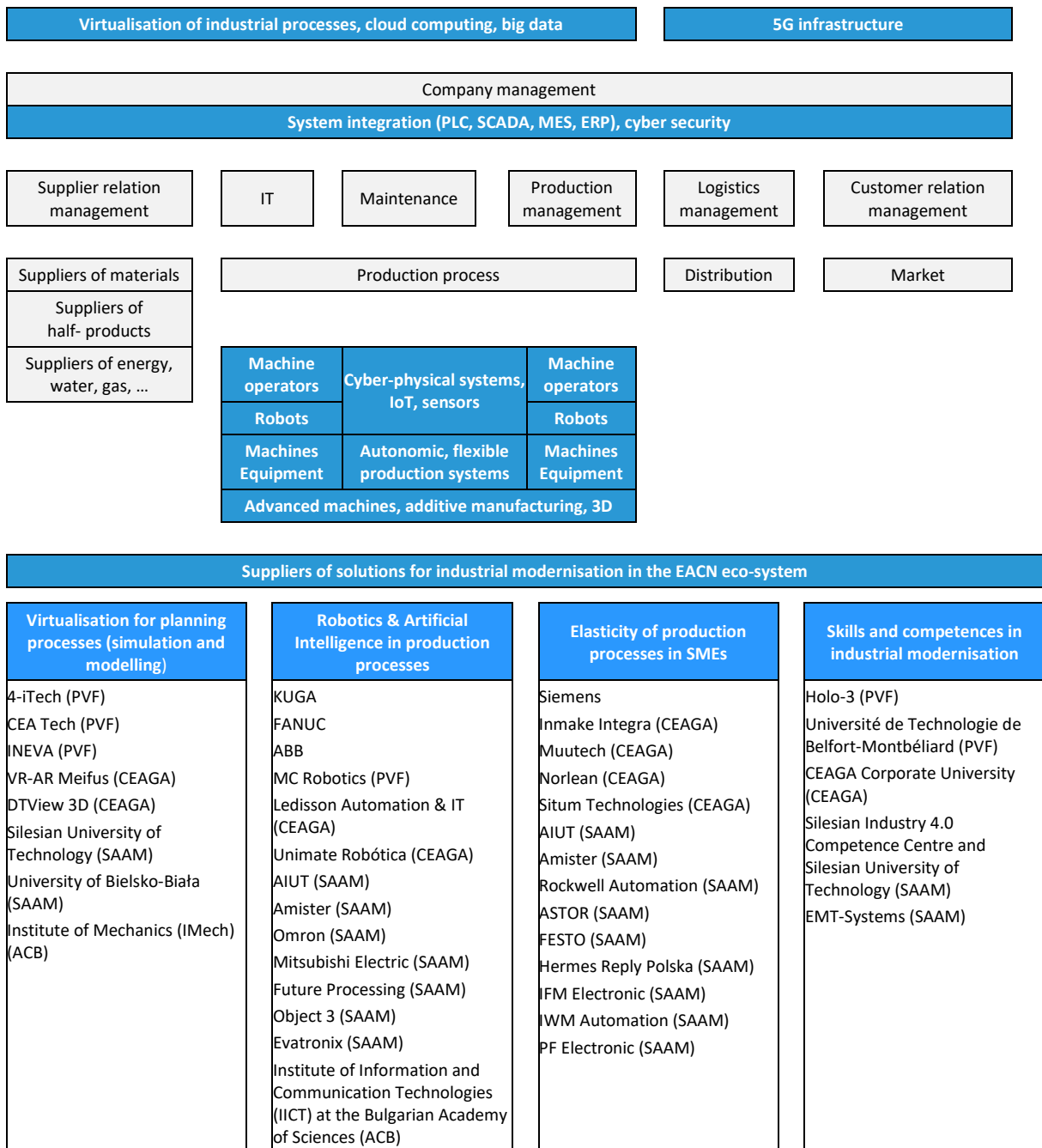


Figure 1 Value chain map

8 Roadmap for Industrial Modernisation in Automotive Clusters

This roadmap presents a comprehensive overview and prioritised list of the joint activities foreseen to be implemented by the cluster partnership, targeting both business-to-business (B2B) and cluster-to-cluster (C2C) collaborations, including a detailed plan for implementation, outlining the different roles, responsibilities, steps and milestones for interregional cooperation and joint project development and implementation, as well as defined opportunities for cooperation with other relevant European and national S3 initiatives and key networks, EEN network and with regional/national authorities on S3 policies.

8.1 Business & project development (B2B)

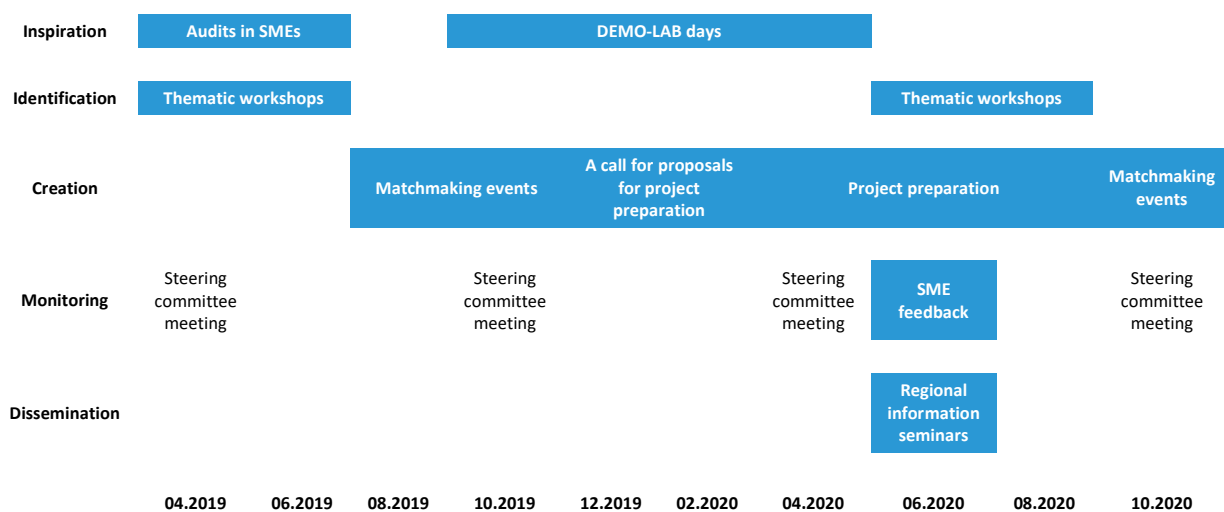


Figure 2: Business & project development roadmap

Inspiration

- ❖ **Audits in SMEs** – in total 50 audits will be provided to SMEs to define issues under the four topics and potential input (own competencies) and expectations towards the role of other actors (complementary competencies). Each SME will receive a two-page audit report with information on cooperation and investment opportunities related to one or more of the four topics covered by the strategy.
- ❖ **DEMO-LAB days** - A call for expression of interest for organising a DEMO-LAB day will be directed to technology suppliers/technology centres in the regions covered by the clusters. Each DEMO-LAB day will cover at least one topic related to: the virtualisation of processes, the incorporation of robotics and artificial intelligence, the configuration of flexible, modular and adaptable production lines. A list of proposals will be sent to the companies that identified the concrete issues during the matchmaking event. Companies select three proposals they are the most interested in. The topic leaders are responsible for organising the DEMO-LAB visits in cooperation with the selected technology supplier/technology centre. The topic leaders will follow-up the outcomes of the DEMO-LAB visits and support the companies in preparing cooperation agreements with the technology suppliers / technology centres. At least one agreement should be concluded as a result of the three DEMO-LAB visits.

Identification

- ❖ **Thematic Workshops** – During three thematic workshops (moderated by the topic leaders) SMEs, technology suppliers and technology centres, universities, R&D organisations will prepare a list of common issues to be included in future projects. Each cluster will bring together the organisations interested in the specific topic in a meeting room and connect to the online conference platform with the other clusters.

Creation

- ❖ **Business matchmaking: “Innovation for industrial change matchmaking events”** – SMEs that took part in the thematic workshops will be invited to prepare search profiles on the online matchmaking tool. The topic leaders will be responsible for the organisational aspects related to their topics: event expert speaker on the topic, contacts with the SMEs, technology suppliers, technology centres, information on the website and in the matchmaking tool. Small groups of companies will meet physically and virtually to elaborate project concepts, discuss common innovation and investment initiatives and prepare an action plan for further cooperation. The outcomes of the discussions will be put on the online matchmaking tool for further refinement into project proposals.
- ❖ **A pipeline of project proposals and cooperation agreements** – The topic leaders will follow up the project development process in cooperation with the involved SMEs. The matchmaking tool and online workshops will be used to refine the project proposals. The topic leaders will follow up business negotiations, deliver support in agreement preparation and in the process of signing cooperation agreements.
- ❖ **A call for proposals to support project preparation** – Step 1: A call for Expression of Interest will be directed to experts and their organisations, who would like to participate in delivering support to project preparation. Information about the expression of interest will be put on the project website and distributed by the Project Partners among potential interested experts and their organisations. On the basis of the expressions of interest a database of experts and their organisations will be prepared. Step 2: A call for proposals will be directed to the companies that participated in the thematic matchmaking events and have prepared preliminary project concepts. Each proposal should be prepared by at least three cluster members from at least two different clusters. Step 3: Based on the technical requirements for the kind of support to be delivered to the specific projects, an expert will be selected. A three-party agreement will be signed between the coordinator of the supported project, the expert’s organisation and the Project Leader. A total of 5 proposals will be selected and receive support in the form of a financial participation of 50% of the expert bill limited to a maximum amount of 4.000,00 euro in preparing a collaborative project for a selected financing instrument or in preparing joint tender procedures for a planned investment related to industrial modernisation.
- ❖ **Support in preparing and filing project proposals** - The selected consortia of companies that were granted the voucher will be supported by the selected external experts (external service) and followed-up by the personnel of the Project Partners (local back-up support if needed). The service will concern dedicated support to help the consortia in preparing and filing project proposals in competitions of selected financing instruments. The time schedule for this task will be refined on the basis of the identified calls for proposals under public financing instruments. At least 5 projects will be ready for implementation (on the condition of granted project proposal

under call for proposals of dedicated regional/national/European programmes and/or closed tender procedure concerning investment projects) by October 2020.

Monitoring

- ❖ **SME feedback** – A survey among the cluster companies that took part in the project activities will be provided with the aim to gain feedback about the role and added value of the EACN Partnership in industrial modernisation change processes. Feedback received from at least 60 SMEs. The results of the survey will be discussed during the Steering Committee Meeting.

Dissemination

- ❖ **An information seminar in the clusters’ regions** - One information seminar per region will be organised to inform the cluster members about the elaborated Strategy, the project outcomes and cooperation opportunities in an interregional dimension with the aim to promote similar cooperation initiatives for other SMEs and to prepare the foundations for new cooperation issues in the framework of the EACN Partnership after the project.

8.2 Joint cluster activities (C2C)

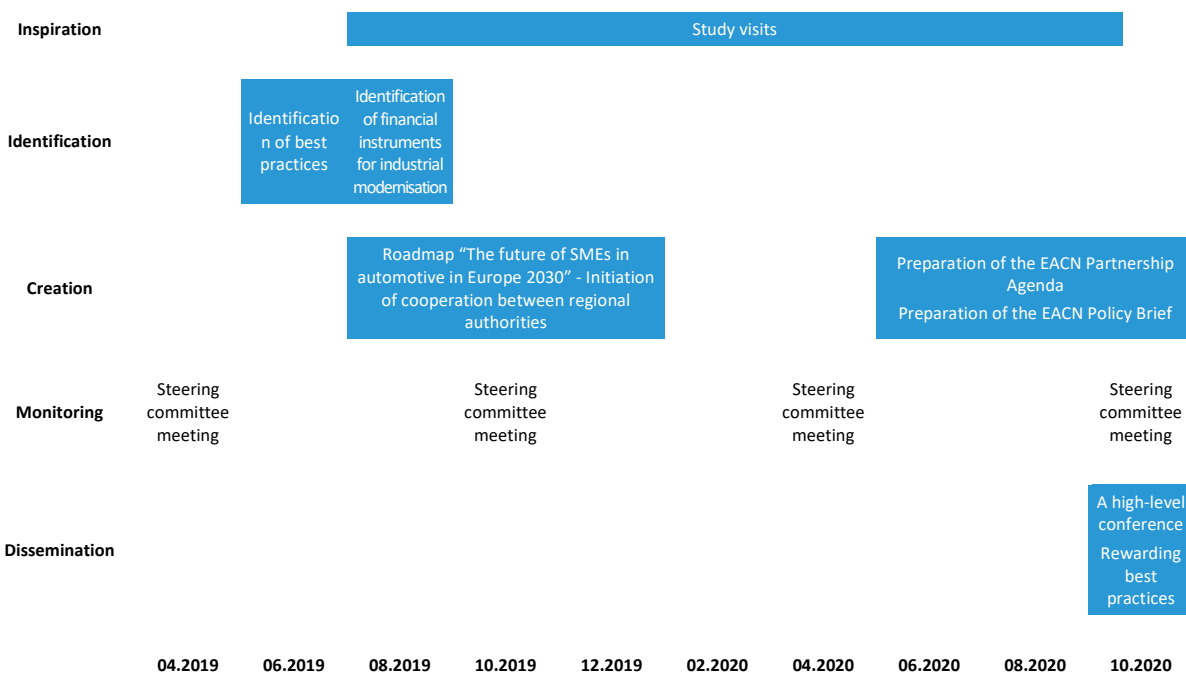


Figure 3: Joint cluster activities’ roadmap

Inspiration

- ❖ **Best practices study visits and cluster cooperation plans** – Study visits (two to three visits) will be connected with a workshop on developing cluster cooperation plans in which the Partnership Members will define how they would like to integrate best practices in their cluster framework, could transfer lessons learned from other clusters and continue cooperation in these fields of interest. At least three cooperation plans will be developed and included in the Strategic Agenda.

Identification

- ❖ **Identification of best practices and success stories** – On the basis of a questionnaire each Partnership Member will provide information about practices and success stories on how to deal with industrial modernisation change processes in clusters and present this information during an online workshop meeting. Three issues related to business models for running competence centres and demonstration facilities (factory-of-the-future), digital innovation hubs (networking with technology suppliers), training and education modules for Industry 4.0 change processes will be selected. An integrated report with the best practices will be disseminated among the Partnership Members.
- ❖ **Identification of financing instruments** – The Partnership Members will identify financial instruments (public and private instruments on regional, national and European level) that support/could support industrial modernisation change processes in companies in the automotive industry. The report on financial instruments will be made available to the participants during the three matchmaking events.

Creation

- ❖ **Roadmap: “The future of SMEs in automotive in Europe 2030”** – A challenge roadmap will be elaborated with the aim to identify long-term challenges for SMEs in the automotive sector and to define the role of clusters and their services/projects in addressing these challenges. During an internal foresight workshop, common challenges, potential approaches to business support, and the role of public support instruments will be identified, taking into account current and future S3 policies on regional and national level. Common framework recommendations for the regional/national authorities in view of the EU financing period 2020-2027 will be formulated and presented to representatives of the regional authorities during an online meeting. The outcomes of this meeting will allow defining the role of regional authorities in the EACN Strategic Agenda.
- ❖ **An EACN Partnership Agenda** – The Steering Committee will develop an EACN Partnership Agenda (long-term cooperation agenda) including a scenario for periodically repeated activities related to the implementation phase and to investment phase after the project in order to sustain the project outcomes and generate new innovation and investment projects. The EACN Partnership will decide upon a stable coordination structure that will allow to continue the work after the project, especially for what concerns feeding of the project pipeline with new projects, monitoring of the indicators, identifying potential resources of financing and cooperation with regional authorities in the S3 policies. The EACN Partnership will define clear cooperation processes including: communication modes and tools, problem solving and decision-making procedures. During a workshop, the EACN Partnership will set the vision and mission, define the strategic agenda, underline cooperation opportunities with other Partnerships and Thematic Networks, identify potential new EACN Partnership members and prepare sound procedures for taking in new members.
- ❖ **Preparation of an EACN Policy Brief** - During a workshop session an EACN Policy Brief on the lessons learned will be prepared. The brief will include recommendations with regard to improving interregional collaboration (both B2B and C2C activities), cover issues related to barriers to innovation, skills, cooperation and investment and the results of the survey among the companies. The EACN Policy Brief will be presented to and discussed with the regional authorities during an online meeting in order to agree upon common cooperation themes between the EACN Partnership and the involved regional authorities. The EACN Partnership Agenda will be included in the final version of the EACN Policy Brief.

Dissemination

- ❖ **A high-level final conference** – the conference has the aim to promote the outcomes of the project, to present the EACN Partnership Agenda and to discuss cooperation opportunities with other Partnerships and European Thematic Networks. The EACN Partnership will inform about possibilities for other clusters to join the EACN Partnership. The conference will be targeted to: other clusters wanting to join the Partnership; companies (cluster members); technology centres, universities and other R&D organisations; technology suppliers; other Partnerships and European Thematic Networks, regional and national authorities. The European Commission will also be invited to participate in this conference.
- ❖ **Rewarding best practices** – In order to make the achievements visible and promote successful industrial modernisation projects, a call will be launched to identify successful projects and reward them. This action will have communicative and relevant impacts on companies and automotive clusters. Not only companies from the clusters involved in the EACN Partnership can participate, but also companies from outside. The results of the first selection procedure will be presented during the final conference.

8.3 Monitoring and information exchange

The Steering Committee is responsible for monitoring the progress of planned and executed activities and for quality and risk assessment in view of reaching the EACN Strategy's goals. The Steering Committee will meet every 6 months, of which the mid-term meeting (about M12) and the final meeting (M23/24, coordinated with the final event) are physical meetings and the intermediary meetings (M6, M18) will be held online. Two of the cofounders of the European Automotive Cluster Network (EACN) initiative – Bayern Innovative and Automotive-BW – not being formal project partners as well as representatives of the regional governments will be invited to participate in the Steering Committee meetings. Additionally, representatives of other European Cluster Partnerships will be invited to share good practices and deliver peer-review feedback.

Based on lessons learned, the EACN Partnership will prepare recommendations for other (future) European Strategic Partnerships. The EACN Partnership will participate with 2 representatives in partnering events for European Strategic Cluster Partnerships organised by the European Observatory for Clusters and Industrial Change.

The EACN Partnership has identified the following opportunities for cooperation with other relevant European and national S3 initiatives and key networks (among which the EEN network):

- ❖ Smart Specialisation Platform 'Safe and sustainable mobility' launched by the French competitiveness cluster Mov'eo. Mov'eo is also candidate to join the EACN initiative. <http://s3platform.jrc.ec.europa.eu/mobility>
- ❖ Alliance Industrie du Futur (AiF) was created in July 2015 to gather the professional organisations of industry and digital sectors as well as academic, technologic and financing partners.
- ❖ Other COSME-S3 projects such as Euro-SME which aims at: stimulating cooperation between clusters for the definition of a common strategy on the priority areas of smart specialization in the aerospace sector; developing a pipeline of inter-regional industrial investment projects for a total amount of approximately 20 million euros, ready for public or private funding; exploiting the potential of the smart specialization to promote new efficient supply chains with a relevant focus on the circular economy. This project is held in the framework of the EACP initiative (European Aerospace Cluster Partnership).
- ❖ PVF is part of an initiative in the Grand-Est region about additive manufacturing and in the AI.

- ❖ Partnership for Advanced Materials for Batteries for Electro-mobility and Stationary Energy Storage – develops joint R&D&I projects on topics related to advanced materials with main objective to apply them in the field of batteries, and in that way, enable electro-mobility and enhance the capacity and performance of stationary energy storage. The partnership, launched in October 2018, is led by Slovenia, Castile and Leon (Spain) and Andalusia (Spain) together with 5 European regions¹³.
- ❖ Partnership for Artificial Intelligence and Human Machine Interface (AI & HMI) – supports the adoption of Artificial Intelligence enhanced cyber-physical system and AI driven HMI. The partnership takes advantage of the knowledge, competencies and capacities of the participating regions' stakeholders in order to accelerate the innovation processes in companies, including SMEs.¹⁴
- ❖ Partnership for Cybersecurity – attempts to create synergies among regions specialising in cybersecurity and develops EU cybersecurity value chains and address the challenges that impact commercialisation of products and services. Led by Brittany (France) the partnership engages the participation of 5 regions and member states. The partnership conducts a pilot project on the interregional acceleration programme for local cyber security scaleups¹⁵.
- ❖ Partnership for Efficient and Sustainable Manufacturing (ESM) – focuses on manufacturing challenges transversal to multiple sectors and aims to create a European network of demo-sites and pilot plants in key-manufacturing areas, leading to the uptake of advanced technologies that increase manufacturing efficiency and sustainability.¹⁶
- ❖ Partnership for High Performance Production through 3D-Printing – aims at fostering the market uptake of 3D-Printing applications of through the development of transregional platforms connecting 3D-Printing capabilities. The partnership engages 25 regions and member states, led by South Netherlands (the Netherlands), Flanders (Belgium) and North Portugal (Portugal).¹⁷
- ❖ Platform for SME integration to Industry 4.0 – fosters joint strategic investment project in Industry 4.0 with the objective to improve the integration of SMEs into international value chains. Led by Tuscany (Italy) and Slovenia the partnership develops among others following areas¹⁸: Production Performance Monitoring Systems; predictive modelling and maintenance; Virtual Reality and Simulation Technologies.

¹³ <http://s3platform.jrc.ec.europa.eu/batteries> [26.02.2019]

¹⁴ <http://s3platform.jrc.ec.europa.eu/artificial-intelligence> [26.02.2019]

¹⁵ <http://s3platform.jrc.ec.europa.eu/cybersecurity> [26.02.2019]

¹⁶ <http://s3platform.jrc.ec.europa.eu/efficient-and-sustainable-manufacturing> [26.02.2019]

¹⁷ <http://s3platform.jrc.ec.europa.eu/high-performance-production-through-3d-printing> [26.02.2019]

¹⁸ <http://s3platform.jrc.ec.europa.eu/sme-integration-to-industry> [04.03.2019]

9 A joint marketing plan

The joint marketing plan has been prepared in line with the Communication and Dissemination Plan (deliverable 7.1, December 2018) in which joint branding, marketing statements for specific target groups, EACN logo and joint communication activities have been included.

9.1 A marketing plan focussed on project development

This marketing plan follows an integrated approach that should allow the EACN Partnership to achieve the following indicators:

- ❖ 560 SME's will be informed about the EACN Strategy
- ❖ 100 SME's are expected to be involved actively in workshops, matchmaking events, seminars
- ❖ 50 audits will be provided in SME's
- ❖ 60 companies will be involved in total in matchmaking activities
- ❖ 15 companies will be involved in 5 projects for a total value of at least 7 MM Euro

Marketing statement directed to the main target group – SMEs in the European automotive industry:

If you know that technological changes are taking place in the global automotive industry, but you do not have the time, the people and the knowledge to get acquainted with those technologies - we help you to get better insight in the possibilities to provide industrial modernisation, to gather inspiration from good practices and examples presented by technology suppliers and to get into contact with potential partners to identify common issues for research and development or investment projects that will enable you to enhance your competitiveness on international level.

Marketing statement directed to technology suppliers, technology centres, R&D organizations and education providers:

SMEs are an important group in the European automotive industry. They face the challenge to keep up with their clients – large companies that are currently investing in new production technologies and digitalisation. While your organisation cooperates with multinationals on large projects, SMEs are looking for suppliers of modular solutions that are scalable in time and affordable with reasonable costs. It demands for a common approach and out-of-the-box solutions. The EACN Partnership invites you to join thematic workshops and matchmaking events in order to identify cooperation issues and initiate demonstration projects with SMEs in the European automotive industry.

Marketing statement directed to regional and national public authorities:

Industry 4.0 policies on European, national and regional level underline the need for awareness raising activities, training and education as well as investment support measures to guide SMEs in industrial modernisation change processes. It is not always clear whether or not these policies should be integrated in existing regional innovation strategies and S3 policies. The EACN Partnership offers the possibility to exchange experiences and good practices among regional and national public authorities' representatives on defining and managing specific support measures for industrial modernisation. We invite you to cooperate closely with the respective cluster in the EACN Partnership and to participate in thematic workshops, Steering Committee meetings and other events organised by the EACN Partnership. Let us join forces to prepare recommendations for regional policies on industrial modernisation in SMEs.

The following communication channels will be applied:

- ❖ The EACN website (<https://www.eacn-initiative.eu/>)
- ❖ The ECCP profile (<https://www.clustercollaboration.eu/escp-s3-profiles/eacn>)
- ❖ Social media:
 - Twitter (https://twitter.com/EACN_Initiative)
 - YouTube (<https://www.youtube.com/channel/UChiEVIs97IRUWIMSKS9wq4Q/playlists>)
 - Instagram (https://www.instagram.com/EACN_Initiative/)
- ❖ Flyer
- ❖ The clusters' websites
- ❖ Regional information exchange by way of direct contacts (telephone, e-mail, meetings) between the cluster management teams and the target groups

9.2 A marketing plan focussed on Partnership Development

The aim of the EACN Partnership is to increase the amount of its members – other automotive clusters and advanced manufacturing clusters in Europe that acknowledge the need for a common approach towards promoting and supporting industrial modernisation change processes in SMEs at the background of challenges resulting from global trends impacting the European automotive industry in a 2025-2030 perspective.

Marketing statement directed to other clusters in Europe:

In the next decade, the European automotive industry will undergo severe changes that will affect especially SMEs, who have been an important part of international automotive supply chains in the past. It is in the interest of clusters to support their members in industrial modernisation, to communicate needs and expectations and to recommend measures on regional, national and European level. The EACN Partnership is a cooperation platform for automotive clusters and advanced manufacturing clusters in Europe to identify needs, create solutions and demonstrate new approaches concerning industrial modernisation in SMEs in the European automotive industry. Become a Partnership Member and allow your cluster companies to participate in EACN activities.

The following communication channels will be applied:

- ❖ The EACN website
- ❖ The ECCP profile and cooperation platform
- ❖ Social media: Twitter, YouTube, Instagram
- ❖ Flyer
- ❖ The Letter of Interest and the Partnership agreement communicated on the EACN website
- ❖ The high-level final conference

10 A Letter of Interest for new Partnership Members

Letter of Interest

European Automotive Cluster Network for Joint Industrial Modernisation Investments

..... (name of the organization) based in(city)(.....(country) would like to express its interest in joining the European Partnership for Industrial Modernisation in Automotive that is being established in the framework of the European Automotive Cluster Network (EACN) project supported by the European Commission call COSME - European Strategic Cluster Partnerships for smart specialization investments COS-CLUSTPARTNS-2017-3-02.

The European Automotive Cluster Network (EACN) brings together nine European clusters in order to boost industrial competitiveness and investment in the European Union via interregional cooperation and networking for smart specialization investments (ESCP-S3). This initiative allows cooperating with similar institutions in various regions of Europe and sharing experiences while focusing on strengthening SME competitiveness in global value chains through industrial modernisation. While acknowledging the global impact of the fourth industrial revolution locally, especially SMEs have to face the challenge to make the right investment decisions in modernisation processes. This alliance between European automotive clusters makes it possible to work cooperatively while collaborating with several European Regional Authorities that face the same challenges, with a clear objective, to seek solutions responding to companies' changes processes with emphasis on SMEs. Through this letter of interest (name of the organization) confirms being interested in contributing to the EACN objectives:

- ❖ creating a long-term strategic alliance between the EACN Partnership members with the aim to work together on common issues related to industrial modernisation;
- ❖ promoting interregional cooperation between cluster members of different clusters with the aim to support change processes in industrial modernisation by sharing best practices and to enhance interregional project development and implementation.
- ❖ promoting interregional business networking among cluster members of different clusters;
- ❖ guaranteeing long-term cooperation among the clusters in the EACN Partnership and their members in line with regional S3 policies and market opportunities;
- ❖ promoting interregional cooperation between regional authorities in order to streamline policies and support measures for industrial modernisation.

The four topics on which the EACN Partnership focusses its activities - the virtualisation of processes, the incorporation of robotics and artificial intelligence, the configuration of flexible, modular and adaptable production lines, as well as the development of new employees' competences - are of the highest interest for our SMEs and industrial members. Therefore (name of the organization) is very much interested in getting acquainted with the EACN activities and in joining the EACN Partnership. (name of the organization) and its members will be able to participate in EACN meetings and events after an invitation from the EACN partners. This potentially means that our members can join project development activities which are in preparation or workshops and matchmaking events in 2020.

We kindly ask you to consider our request for engagement in EACN activities (costs covered by our organisation or by our cluster members) and for membership in the EACN Partnership.

11 Agreement of the European Partnership for Industrial Modernisation in Automotive

Agreement

the European Partnership for Industrial Modernisation in Automotive

Preamble

The European Automotive Cluster Network (EACN) was founded in 2017 by nine European automotive clusters aiming at collaborating in four strategic domains¹⁹:

1. Product: new materials, new vehicle concepts
2. Production: additive manufacturing, supply chain optimization
3. Process: digitalisation, new and innovative production tools
4. People: working environment, training/education, skills and competencies

In October 2018, the European Commission funded the two-year initiative “European Automotive Cluster Network for joint Industrial Modernisation Investments” (Grant Agreement 821989; “The Project”) by the COSME programme. The project had been submitted by six EACN members to guide Automotive SMEs in industrial modernisation processes by identifying opportunities for change, sharing good practices, enabling contacts with solution providers and delivering expert support in investment project and collaboration project preparation. This EACN initiative was honoured with the European Commission’s Smart Specialisation Label ESCP-S3. The Project Consortium Members are:

- ❖ POLE VEHICULE DU FUTUR ASSOCIATION (PVF) established in Centre d’affaires Technoland, 15 rue Armand Japy, 25461 Etupes, France (“The Project Coordinator”);
- ❖ FUNDACION CLUSTER DE EMPRESAS DE AUTOMOCION DE GALICIA (CEAGA) established in Avenida Citroën 3 y 5, 36210 Vigo, Spain;
- ❖ ASSOCIACIO CLUSTER DE LA INDUSTRIADE L’AUTOMOCIO DE CATALUNYA (CIAC) established in Passeig de Gràcia, 08008 Barcelona, Spain;
- ❖ KATOWICKA SPECJALNA STREFA EKONOMICZNA SA representing the Silesia Automotive & Advanced Manufacturing Cluster (SAAM) established in Wojewodzka 42, 40-026 Katowice, Poland;
- ❖ SDRUZHENIE AUTOMOTIVE CLUSTER BULGARIA (ACB), established in Sofia Tech Park, Incubator Building, fl.3, 111B Tsarigradsko Shose Blvd., Sofia 1784, Bulgaria;
- ❖ AUTOMOBILSKI KLASTER SRBIJE (ACS) established in Majke Jevrosime 9, 11000 Belgrade, Serbia.

The relationships, rights and obligations between the Project Consortium Members are governed by the Project Partnership Agreement (Consortium agreement) signed in October 2018. However, it is the aim of the project consortium to involve a wider group of automotive clusters and advanced manufacturing clusters and their respective members in promoting industrial modernisation

¹⁹ For the initial EACN Agreement and the Appendix for new Clusters wishing to join EACN, see Annex A and B

processes in the European automotive sector. This Agreement of the European Partnership for Industrial Modernisation in Automotive (“Agreement”) defines the relations between the project consortium and other clusters willing to cooperate within this project and engaging their members in the project activities. In a long-term perspective, this Agreement will pave the way for a network structure beyond October 2020 and a common cooperation agenda on industrial modernisation investments in automotive in Europe.

Partnership overall objective for Industrial Modernisation Investments

The aim of the European Partnership for Industrial Modernisation Investments in Automotive (also “The Partnership”) within the European Automotive Cluster Network is to bring together experience and expertise in industrial modernisation from different stakeholders – including SME’s and large companies in Automotive, research and development centres and science and technology parks, as well as technology and integrated solution suppliers – in order to:

1. Raise awareness among SME’s in automotive on the need to launch industrial modernisation;
2. Share good practices about scalable solutions for industrial modernisation among SME’s;
3. Work together on defining needs and potential solutions for industrial modernisation in SME’s;
4. Promote interregional cooperation between cluster members of different European regions in the framework of investment projects and collaboration projects on industrial modernisation;
5. Promote interregional cooperation between regional authorities in order to streamline policies and support measures for industrial modernisation.

Partnership values

The Partnership members agree to share the following values:

1. Each cluster organisation in the Partnership will promote the Partnership’s goals and activities during its own cluster events and invite its cluster members to participate in projects for industrial modernisation;
2. Each cluster member of each cluster organisation in the Partnership has equal chances and rights to participate in the Partnership activities;
3. Each cluster member as well as each cluster organisation in the Partnership will respect non-disclosure of industrial know-how and other information gathered or received during the participation in the Partnership’s activities;
4. Each cluster member as well as each cluster organisation in the Partnership will respect national and international legal frameworks, especially the laws on fair competition and the laws on intellectual property;
5. Each cluster member as well as each cluster organisation in the Partnership involved in projects on industrial modernisation – identified, prepared and realised within the Partnership – will treat project partners on an equal and respectful base, seek to solve problems in a constructive way and try to reach common agreed goals in the most efficient and effective way.

Cooperation modes

The cooperation modes between the Project Consortium Members strictly related to the Project are defined in the Consortium Agreement.

The following cooperation modes define the daily operational activities of the Partnership under this Agreement:

1. Each cluster organisation in the Partnership appoints a contact person responsible for industrial modernisation projects. This person will receive a service package in English including: information materials, audit forms, reporting forms, instructions for guiding SME's through the project preparation process (matchmaking platform, B2B events, cooperation with technology suppliers);
2. The designated contact person shall not be entitled to make and receive statements with binding effect upon each Party. The designated contact person's responsibility is to promptly forward any statements to the appropriate recipient within his organisation. Each Party shall be entitled to replace its contact person through other appropriate persons by written notice to the Partnership Coordinator. Notices and other communication between contact persons shall be affected in writing by email, facsimile, registered mail express courier or in other written form ensuring credible evidence in writing. Notices will be deemed delivered on the date shown on the postal return receipt or on the courier, facsimile or email confirmation of delivery. The contact person will communicate with the Partnership Coordinator and with contact persons of other cluster organisations in the Partnership on a regular base;
3. The Partnership activities are dedicated to the needs of the cluster members. These needs are identified during audits in SME's, thematic workshops, cooperation on the matchmaking platform and B2B events. The cluster organisations in the Partnership will inform SME's about interregional cooperation opportunities for industrial modernisation during routine cluster events and direct contacts with SME's;
4. Workshops, good practice exchange activities and matchmaking take place in dedicated groups in which quality is more important than quantity. The cluster organisations in the Partnership will select potential participants on the basis of audits, direct contacts and proposals filed on the matchmaking platform. Each cluster organisation in the Partnership will support its cluster members in getting into contact with potential partners from other clusters and in preparing draft project proposals concerning industrial modernisation on the matchmaking platform;
5. Each cluster organisation in the Partnership will inform the Partnership Coordinator about activities concerning the promotion of industrial modernisation among SME's organised on regional level and about success stories related to industrial modernisation projects;
6. Each cluster organisation in the Partnership will bare its own costs related to participation in the Partnership's activities. The organisations in the Partnership will try to find other financing resources that allow them and their cluster members to participate at a lower own cost or to increase the scale and/or range of Partnership's activities.

Conditions for participation, rights and obligations of the Partnership

1. The Partnership is addressed to automotive clusters in Europe. Cluster organisations interested in entering the Partnership (Applicant) can send a request to the Partnership Coordinator. The Partnership Coordinator shall present the Applicant's request to the project Steering Committee members, who will decide unanimously about the Applicant's membership.
2. By signing this Agreement, the Applicant accepts the terms of this Agreement, confirms its willingness to actively promote industrial modernisation in SME's in the European automotive sector and becomes official Partnership Member.
3. For the duration of the project "European Automotive Cluster Network for joint Industrial Modernisation Investments" under COSME – that is until 15 October 2020 – the Partnership members do not contribute membership fees.
4. The final management and operational model of the Partnership will be elaborated and discussed with the Partnership Members in the course of the project "European Automotive Cluster Network for joint Industrial Modernisation Investments" under COSME, including the level of annual fees that Partnership Members will be obliged to pay from November 2020 on for the duration of their membership in order to secure sustainability of the Partnership and its daily coordination by the Partnership Coordinator, in case they want to remain part of the Partnership.
5. For the duration of the membership, each Partnership Member has the right to use the status: "*Member of the European Partnership for Industrial Modernisation Investments in Automotive*" and to mention the logo on its website and in marketing and information materials concerning activities related to the topics and actions planned and implemented within the Partnership.
6. For the duration of the membership, each Partnership Member has the obligation to:
 - a. Inform the Partnership Coordinator about the authorised legal representative(s), who represents the Partnership Member in legal matters;
 - b. Appoint a contact person, who has the right and obligation to receive and to share information related to the Partnership activities;
 - c. Identify possibilities to engage the contact person or other representatives in activities of the thematic groups related to:
 - i. Virtualisation for planning processes (simulation and modelling),
 - ii. Robotics & Artificial Intelligence in production processes,
 - iii. Elasticity of production processes in SMEs,
 - iv. Skills and competences in industrial modernisation;
 - d. Support SME's that are interested in participating in the Partnership's activities, including in workshops, matchmaking events and project development on industrial modernisation;
 - e. Take part in surveys and audits focussing on identifying SMEs challenges and needs concerning industrial modernisation and on identifying topics for new research and development projects and investment projects;
 - f. Engage in project development for specific calls for proposals by way of supporting SMEs wanting to enter into international cross-sectoral projects on industrial modernisation with other SMEs, technology suppliers and specialised centres of other Partnership Members;

- g. Promote industrial modernisation among SMEs in automotive as a way to enhance their competitiveness and secure their role in international automotive value chains at the background of global trends effecting the overall automotive industry.
- h. Report the uses of the status “*Member of the European Partnership for Industrial Modernisation Investments in Automotive*” or of the logo to the Partnership Coordinator.

Governance structure

For the duration of the Project – that is until 15 October 2020 – the following Partnership Governance Structure will be applied:

1. **The Partnership Assembly** – Each Partnership Member has the right to appoint a representative in the Partnership Assembly. Each representative has one vote. Decisions will be taken by a simple majority vote. The Partnership Coordinator’s representative is the President of the Partnership Assembly. The President will have the casting vote in the event of an equality of votes. The President is entitled to use a veto should a proposal be in conflict or impose a potential risk of conflict in a later stage with the outlines of the Grant Agreement 821989 signed on 18 October 2018. The Partnership Assembly is authorised to discuss and confirm the following documents: updates of the Joint Cluster Partnership Strategy for Industrial Modernisation Investments in Automotive, the Partnership Agenda for long-term cooperation and business development strategy, the Policy Brief concerning interregional cooperation on industrial modernisation in SMEs in the European automotive sector.
2. **The Partnership Coordinator** – This is the Project Coordinator, whose role and responsibilities are outlined in the Grant Agreement 821989 and in the Consortium agreement. The Partnership Coordinator - as a legal body - shall represent the Partnership in any contractual relation with external actors. The Partnership Coordinator will administer the Partnership’s Secretariat. Until the end of the Project, the Partnership Coordinator is Pôle Véhicule du Futur (PVF), France, coordinator of the Project.
3. **The Project Steering Committee** – The Project Steering Committee is the decision-making body of the Consortium. Its role and responsibilities are outlined in the Consortium agreement.
4. **The Topic Leaders and thematic workgroups** – Topic Leaders are responsible for the interregional relationship building process within thematic workgroups in which SMEs (automotive suppliers), technology suppliers and technology centres, universities, R&D organisations will define their role in common projects. The workgroups are the cornerstone for the following activities: online meetings to define potential cooperation proposals based on complementary competencies and synergies, tailored B2B meetings (virtual matchmaking process and physical matchmaking events) to refine the cooperation proposals into project descriptions, direct support for SMEs in defining intellectual property right issues and feasibility of proposed actions. The thematic workgroups will organize their work, communication and decision making by themselves in line with the project objectives and time schedule, assuring openness and fair representation of Partnership Members involved in the activities. The following Topic Leaders have been appointed:
 - a. ACS – Virtualisation for planning processes (simulation and modelling),
 - b. CIAC – Robotics & Artificial Intelligence in production processes,
 - c. PVF – Elasticity of production processes in SMEs,
 - d. SAAM – Skills and competences in industrial modernisation.

Settlement of disputes

1. In case of disputes that may arise concerning the application or the interpretation of this Agreement or between two or more Partnership Members relating to the interpretation or implementation of this Agreement, the Partnership Members involved shall promptly inform the Partnership Coordinator of any problem or of any circumstance that may affect the well-functioning of the Partnership. Together with the Parties involved, the Partnership Coordinator will apply dialog and peaceful means to settle the dispute. In any case the Partnership Coordinator shall not enlarge its role beyond the tasks specified in this Consortium Agreement and in the Grant Agreement.
2. If the Partnership Coordinator fails to settle the dispute between Parties, the Parties involved in the dispute will seek other legal ways to solve the dispute. The Partnership Coordinator is entitled with the right to suspend the membership of these Parties until the dispute is settled or a reasonable solution has been implemented that satisfies all involved Parties.
3. Disputes between Consortium Members are governed by the Grant Agreement 821989 and in the Consortium agreement.

Entry into force and duration of the Partnership

1. This Agreement is an integral part of the European Strategic Cluster Partnership Agreement “European Automotive Cluster Network”.
2. This Agreement enters into force on the date of the signature of the Consortium Members as a result of the formal acceptance of this Agreement by the Project Steering Committee.
3. Any Applicant whose application for becoming a Partnership Member has been accepted by the Project Steering Committee, will first sign the appendix to the European Strategic Cluster Partnership Agreement “European Automotive Cluster Network” in order to become official member of the European Automotive Cluster Network. Next the Applicant will sign the appendix to this Agreement, as such he will become official Partnership Member.
4. No specific Partnership duration term has been set by the Consortium Members.

Resignation, exclusion of Partnership Members

1. Any Partnership Member not being a Consortium Member is entitled to withdraw from the Partnership by providing written notice of 30 days to the Partnership Coordinator, after implementation and/or transfer of previous agreed engagements, tasks, works to other Partnership Members.
2. For the duration of the Project – that is until 15 October 2020 – the Consortium Members are obliged to develop and maintain the Partnership. They are only allowed to leave the Partnership in cases mentioned in the Grant Agreement 821989 and in the Consortium agreement. After this date, the same rights as mentioned in point 1. above apply to the Consortium Members.

Data protection

1. In line with the requirements of European regulation 2016/679 General data Protection Regulation (GDPR), Pôle Véhicule du Futur is the Data Administrator for the personal data of legal representatives and contact persons of the Partnership Members.
2. Each Partnership Member engaging its cluster members in Partnership activities should process personal information according to the rules set forth by the GDPR Supervisory Authority (SA) in the specific country.
3. In case of data breaches, the person responsible for the breached data shall notify both the national SA and the Partnership Coordinator as soon as possible, but at maximum during 72 hours. The individuals whose personal data were breached shall also be notified without undue delay.
4. If a person wishes his/her personal data to be erased, that can and shall be done.
5. Personal data collected in the framework of this Partnership will be used only by the Partnership Coordinator and the Topic Leaders for purposes needed for the implementation of planned and agreed actions, including communication with participants of workshops, matchmaking events, project development activities. If personal data is provided, the data shall not be distributed further within or outside the Partnership.

Miscellaneous

1. The co-operation of the Partnership Members under this Agreement shall be non-exclusive. Each Party shall remain entitled to enter into similar contractual relations with third parties.
2. Any amendment or modification of this Agreement requires the written form. This also applies to any amendment or modification of this written form requirement. Amendments of this Agreement that appear until 15 October 2020 shall be discussed and agreed upon by the Project Steering Committee. Partnership Members shall be informed in written by the Partnership Coordinator about the amendments of the Agreement. Each Partnership Member not being a Consortium Member has the right not to accept the amendments in written notice to the Partnership Coordinator in 14 days from the day of having received written notice of the amendments, as a result of which the membership of this Partnership Member automatically terminates on the day the Partnership Coordinator receives the written notice. In case a Partnership Member did not protest against amendments of this Agreement within 14 days of having received information about the amendments in written notice from the Partnership Coordinator, it is assumed that that Partnership Member accepted the amendments and will respect them.
3. Should one or several provisions of this Agreement become invalid or unenforceable in total or in part, the remaining provisions of this Agreement shall remain unaffected hereby. The invalid or unenforceable provision shall be replaced by a valid and enforceable provision that comes closest to the original intention of the Parties.
4. No Party shall be entitled to act or to make legally binding declarations on behalf of any other Party of the consortium. Nothing in this Agreement shall be deemed to constitute a joint venture, agency, partnership, interest grouping or any other kind of formal business grouping or entity between the Parties.

5. This Agreement shall be governed by the law of [Belgium].
6. Any delay or failure in performance shall not be deemed a breach when such delay or failure is due to causes beyond the reasonable control and without negligence of the Party charged with such performance, including, but not limited to, fire, flood, accidents, explosions, hardships, acts of God, trade embargo or sanction (“Force Majeure”). The Party claiming Force Majeure shall notify the other Party, in writing, within 10 days after the occurrence of the Force Majeure event specifying the nature and anticipated duration of the delay. The Parties shall use best efforts to avoid or minimize the effects of delay or non-performance.
7. Any ambiguity in this Agreement shall be interpreted equitably without regard to which Party drafted the Agreement or any provision thereof.

Signatures

The Parties have caused this Agreement to be duly signed by the undersigned authorised representatives in separate signature pages the day and year first above written.

12 Contact

For more information about the European Automotive Cluster Network for Joint Industrial Modernisation Investments initiative, please check the website: www.eacn-initiative.eu or contact us: info@eacn-initiative.eu.

You may also contact one of the cluster organisations which participate in the EACN project activities:

Pôle Véhicule du Futur

www.vehiculedufutur.com

Katowice Special Economic Zone SA, Silesia Automotive & Advanced Manufacturing

<http://silesia-automotive.pl/>

Galician Automotive Cluster Foundation

www.ceaga.com

Automotive Industry Cluster of Catalonia

www.ciac.cat

Automotive Cluster Bulgaria

www.automotive.bg

Automotive Cluster Serbia

www.acserbia.org.rs

Annex A: EACN Partnership Agreement of founding members



European Strategic Cluster Partnership Agreement European Automotive Cluster Network EACN

Between

automotive-bw,
c/o RKW Baden-Württemberg GmbH, Königstraße 49, 70173
Stuttgart, Germany,
represented by Mr. Dr. Albrecht FRIDRICH, CEO



And

Bayern Innovativ,
Bayerische Gesellschaft für Innovation und Wissenstransfer
mbH, Gewerbemuseumsplatz 2, 90403 Nürnberg, Germany
represented by Mr. Dr. Rainer SEßNER, CEO



And

EASN European Automotive Strategy Network,
A label of FIER BV
Automotive Campus 30, PO Box 1015, 5700 MC Helmond, The
Netherlands,
represented by Mr. Harm WEKEN, Director FIER BV



And

Galician Automotive Cluster Foundation (CEAGA),
Avda. Citroën 3 y 5, Edificio Zona Franca 1ª planta, 36210 Vigo,
Spain
represented by Mr. Alberto Cominges Barreiro-Meiro, Cluster
Manager



And

Automotive Cluster Bulgaria,
Sofia Tech Park, Incubator Building, fl.2, office 2.07a, 111B
Tsarigradsko Shose Blvd., Sofia 1784, Bulgaria
represented by Mr. Lyubomir STANISLAVOV, CEO



And

Pôle Véhicule du Futur,
Centre d'Affaires Technoland, 15 rue Armand Japy, 25461
Etupes Cedex, France
represented by Mr. Denis REZÉ, President



commonly called **partners**

Preamble

Clusters are defined as « geographic concentrations of industries and associated institutions related by knowledge, skills, inputs, demand, and/or other linkages »¹. They are a leverage factor to strengthen competitiveness of their members. Therefore, the European Commission fosters cluster creations as well as inter-cluster collaborations. In May 2016, the European Commission published a Call for the Expression of Interest “Towards European Strategic Cluster Partnerships (ESCP) for smart specialisation investments” in the field of industrial modernisation². The attribution of a European label for selected European Strategic Cluster Partnerships is foreseen. By this, the European Commission aims at supporting clusters and cluster members to cooperate across borders and across sectors, to innovate together for better competitiveness, and finally to stimulate common businesses and common investments and thereby economic growth.

The European automotive sector faces big challenges due to upcoming trends such as electro or shared mobility or autonomous and connected cars. In addition, new competitors such as e.g. Tesla, Google, Uber or Apple are entering to the market with new products and services.

To hold or increase competitiveness, the European Automotive Industry needs to be innovative with regard to the products, the production, the processes and the people. Industrial modernisation, industry of the future, or Industry 4.0 are the main key issues allowing producing well adapted, cost-effective, and sustainable vehicles, and enabling Europe to stay a world-wide leader in this domain.

All partners are clusters focussing on the automotive sector, with OEMs, SMEs as well as academic and institutional members. Most of the partners still cooperated in former European research projects. This partnership will help strengthen cooperation between the clusters and their members.

1 Objectives

The general and specific objectives of this partnership are the following:

- 👉 apply for the ESCP Smart Specialisation Label after publication of the call by the European Commission (foreseen in 2017)
- 👉 generate and/or increase confidence between the partners and their members by
 - 👉 the organisation of cross-cluster actions such as e.g. B2B and C2C (Cluster-to-cluster) matchmaking events
 - 👉 common stands on expositions,
 - 👉 invitation of the partners and their members to local events held by one partner
- 👉 create new knowledge by common projects by
 - 👉 cross-cluster creativity workshops
 - 👉 common innovation and cooperation projects
 - 👉 Benchmark of best practices and success stories of the partners and their members
- 👉 share and mutualise the financial risk of new tools
 - 👉 joint development of products, solutions, processes between cluster members
- 👉 generate new businesses

This list is not exhaustive; other actions can be decided by the partners at any time.

¹ Delgado, Mercedes; Porter, Michael; Stern, Scott (2014): Defining Clusters of Related Industries. Cambridge, MA: National Bureau of Economic Research

² EC European Commission (2016): Towards European Strategic Cluster Partnerships for smart specialisation investments. Call for Expression of Interest. DG GROWTHG, www.clustercollaboration.eu/sites/default/files/news_attachment/call_for_the_expression_of_interest_escp_s3_may2016_final.pdf, [19/05//2016]

2 Nomination

The partners agree to use the following name/acronym for this partnership:

European Automotive Cluster Network
EACN

3 Strategic Activity Domains

The partners agree to focus the partnership activities in the field of Industry 4.0 – Factory of the Future – Industrial modernisation with the following four strategic domains:

- 🔧 **Product**
e.g. new materials (lightweight construction), new vehicle concepts (esp. EV-concepts, autonomous vehicles)
- 🔧 **Production**
e.g. additive manufacturing, supply chain optimization, responsive maintenance, ...
- 🔧 **Process**
e.g. Digitalisation, New and innovative production tools, ...
- 🔧 **People**
e.g. working environment, training/education, skills 4.0 and re-talenting to meet the skills gap, ...

This focus shall not be limited and can be revised at any time by the partners.

4 Governance

This partnership will be governed by a Cluster Board, composed of the managing directors of the partners. The delegation of this function to another representative can be decided by each partner. The Cluster Board is managed by a president assisted by a secretary. Both are responsible for the animation and the management of the partnership.

President and secretary are elected for one period lasting

- 12 months whilst the partnership totals a maximum of seven partners, and
- 6 months if the number of partners exceeds seven.

In general, the secretary will become president of the next period to insure a continuousness of information and work.

The cluster board meets at least once per year

- to evaluate the partnership at its whole,
- to draw a balance on the realised activities,
- to decide necessary adaptations of the partnership,
- to discuss and agree on ongoing and new actions for the next period,
- to agree on the new president and secretary

A dedicated person as stable contact for European issues will be nominated for a longer period.

5 New members

The Cluster Board can at any time decide to accept new partners to this partnership. A majority of 2/3 of the Cluster Board members is needed to confirm the partnership of a new member.

6 Publication

The partners engage to publish the partnership and the participating clusters in an adequate manner, especially on their own website.

EACN - European Automotive Cluster Network - Partnership Agreement

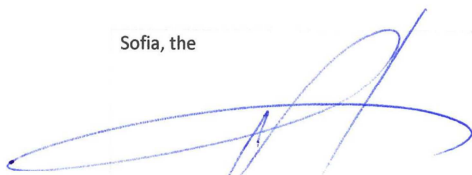
7 Related documents

The document "*Description of a European Strategic Cluster Partnership in the Automotive sector.pptx*" (161110 ESCP Auto - Draft description V0.2.pptx) describes more in detail the partnership and is part of this agreement.

8 Duration

This partnership is concluded for duration of five years, starting at the date of signature. It can be renewed by simple decision of the partners.

Sofia, the



Automotive Cluster Bulgaria
Mr. Lyubomir STANISLAVOV
CEO

Stuttgart, the

automotive-bw
Mr. Dr. Albrecht FRIDRICH
CEO

Nürnberg, the

Bayern Innovativ
Mr. Dr. Rainer SEßNER
CEO

Helmond, the

EASN European Automotive Strategy Network
Mr. Harm WEKEN
EASN Board Director

Vigo, the

Galician Automotive Cluster Foundation
Mr. Alberto Cominges Barreiro-Meiro
Cluster Manager

Etupes, the

Pôle Véhicule du Futur
Mr. Denis REZÉ
President


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Other signatures on following pages.

Annex B: Appendix to the EACN Partnership Agreement for new Cluster members



Appendix to the European Strategic Cluster Partnership Agreement European Automotive Cluster Network EACN

<p>Between</p> <p>Pôle Véhicule du Futur, Centre d'Affaires Technoland, 15 rue Armand Japy, 25461 Etupes Cedex, France represented by Mr. Denis REZÉ, President</p> <p>Representing the European Automotive Cluster Network</p>	
<p>And</p> <p>Name of Cluster Address of cluster represented by Name of representative hereafter called "New Member Cluster"</p>	<p>Logo of cluster</p>

commonly called **partners**

Preamble

The EACN has been founded in the beginning of 2017 by six (6) European automotive clusters aiming at collaborating especially in the field of Industry 4.0 – Factory of the Future – Industrial modernisation with the following four strategic domains:

- Product: new materials, new vehicle concepts, etc.
- Production: additive manufacturing, supply chain optimization, etc.
- Process: digitalisation, new and innovative production tools, etc.
- People: working environment, training/education, skills 4.0 and re-talenting to meet the skills gap, etc.

EACN pursues the following objectives:

- Apply for the ESCP Smart Specialisation Label after publication of the call by the European Commission (foreseen in 2017).
- Generate and/or increase confidence between the partners and their members by:
 - The organisation of cross-cluster actions such as e.g. B2B and C2C (Cluster-to-cluster) matchmaking events.
 - Common stands on expositions.
 - Invitation of the partners and their members to local events held by one partner
- Create new knowledge by common projects by:

