

CHARM PROJECT DEVELOPS IOT SOLUTIONS FOR HARSH INDUSTRIAL ENVIRONMENTS

The CHARM ECSEL JU project aims to develop industrial IoT solutions with an improved tolerance towards harsh industrial surroundings. Digitalisation of the European manufacturing industries is the key to their continuous renewal and competitiveness. Harsh environmental conditions in manufacturing processes and end user environment may slow down the opportunities brought by IoT (Internet of Things) and AI (Artificial Intelligence). The CHARM project is set to solve this challenge.

CHARM (Challenging environments tolerant Smart systems for IoT and AI) is an extensive three-year project with 37 partners from 10 European countries and a total budget of 29 M€. It is co-financed via ECSEL Joint Undertaking, EU Horizon 2020, national funding agencies of the participating countries and the consortium partners. The partners come from Austria, Belgium, Czech Republic, Finland, Germany, Italy, Latvia, the Netherlands, Poland and Switzerland.

Launched in June 2020, the CHARM project will develop condition monitoring, predictive maintenance, automation, real-time manufacturing control and optimisation and virtual prototyping system demonstrators and test them in industrial settings. The ECS (Electronics, Components and Systems) technologies must be designed to withstand combinations of severe thermal, mechanical, and chemical stress present during the manufacturing processes used in the industry. Solutions will be demonstrated for six use cases that cover condition monitoring, predictive maintenance, and real-time quality assurance.

The CHARM use case leaders come from six different manufacturing sectors covering mining (Sandvik Mining and Construction Oy, FI), paper mills (Valmet Technologies Inc., FI), machining (Tornos SA, CH), solar panel manufacturing (Applied Materials Italia SRL, IT), nuclear power plant maintenance and decommissioning (ÚJV Řež, a. s., CZ) and professional digital printing (Canon Production Printing Netherlands B.V.). The project consortium consists of 11 small and mid-sized enterprises, 14 large enterprises and 12 research and technology organisations. They represent the industrial value chain from simulations, sensors and components to packaging, integration and reliability as well as connectivity, cloud and cyber security solutions.

The project will develop sensors for e.g. gas detection, high temperature and pressure, as well as advanced vision systems for real-time quality control and autonomous equipment for industrial applications. Electronics component packaging technologies beyond state-of-the-art will be used to ensure that the sensors are able to withstand the harsh conditions. The IoT systems will also include new solutions for wireless power transfer, connectivity and cybersecurity.

Valmet, the leading global developer and supplier of technologies, automation and services for the pulp, paper and energy industries, acts as the project coordinator for CHARM. "We are excited to participate in this European network to develop IoT capabilities for value-adding customer solutions," says **Heikki Kettunen**, Senior Manager R&D at Valmet. Spinverse, the Nordic innovation consulting company, coordinated the project proposal and consortium building and has been selected by the partners to support in project planning and management as well as in administration and facilitation as the project progresses.



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Consortium project partners:

Project coordinator: Valmet Technologies Inc.

aixACCT Systems, Applied Materials Italia, AT&S Austria Technologie & Systemtechnik, Beneq, Besi Austria GmbH, Besi Netherlands B.V., Canon Production Printing Netherlands B.V., Consorzio Nazionale Interuniversitario per la Nanoelettronica, CSEM Centre Suisse d'Electronique et de Microtechnique, Delft University of Technology, E+E Elektronik Ges.m.b.H., Fraunhofer Institute for Reliability and Microintegration IZM, Imec Netherlands, InnoSenT GmbH, ŁUKASIEWICZ - Instytut Technologii Elektronowej, Lapland University of Applied Sciences, Luna Geber Engineering, Materials Center Leoben Forschung GmbH (MCL), NOME, Pac Tech Packaging Technologies GmbH, Qplox Engineering, Quantavis, Reden, Riga Technical University, SAF Tehnika, Sandvik, SmartMotion, SSH Communications, Sylvac SA, Tampere University, Technische Universität Chemnitz, TIPb, Tornos SA, ÚJV Řež, a. s., University of West Bohemia, Würth Elektronik

About ECSEL JU

The "Electronic Components and Systems for European Leadership" (ECSEL) is a Joint Undertaking established in June 2014 by the European Union Council Regulation No 561/2014. The ECSEL Joint Undertaking – the Public-Private Partnership for Electronic Components and Systems – funds Research, Development and Innovation projects for world-class expertise in these key enabling technologies, essential for Europe's competitive leadership in the era of the digital economy. Through the ECSEL JU, the European industry, SMEs and Research and Technology Organisations are supported and co-financed by 30 ECSEL Participating States and the European Union. A total of approximately 346 M€ European and national grants have been awarded to proposals with total eligible costs of about 748 M€ arising from the ECSEL JU, making another step forward in the 5 B€ programme to be supported by ECSEL JU.

<https://ec.europa.eu/digital-single-market/en/ecsel>



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