



ADMONT KET Pilot Line: A success story

The ADMONT project addresses the call ECSEL Joint Undertaking 2014-2 “Innovation Action” for multi-KET pilot lines

ADMONT includes prototyping, testing, demonstrating, piloting and system qualification between TRL4 and TRL8. ADMONT is an ECS (European Electronic Components and Systems) ecosystem for Europe in agreement with the EFRE strategy from Saxony with strong influence on economic growth and employment in the Union. It will affect employment rate (locally and Europe wide), energy efficiency in end products – manufactured and sold in Europe – as well as energy and resource efficiency in the industrial production itself.

ADMONT is planned and is going to be installed as an incubator center for SME innovations in Europe for electronic systems and solutions based on semiconductor technologies.

The overall goal of ADMONT is to implement a distributed More-than-Moore pilot line for products and services based on a wide-ranging set of technologies or essential capability modules (ECM) not available within one manufacturing facility. In order to allow development and industrialisation of innovation projects, a virtual facility capable to provide diverse process flows as a ‘one-stop-shop’ needs to be carefully specified, planned and implemented.

Besides the specific challenges of More-than-Moore manufacturing lines (flexibility, high level of technology and product mix) the distribution of capabilities is an important consideration in order to achieve

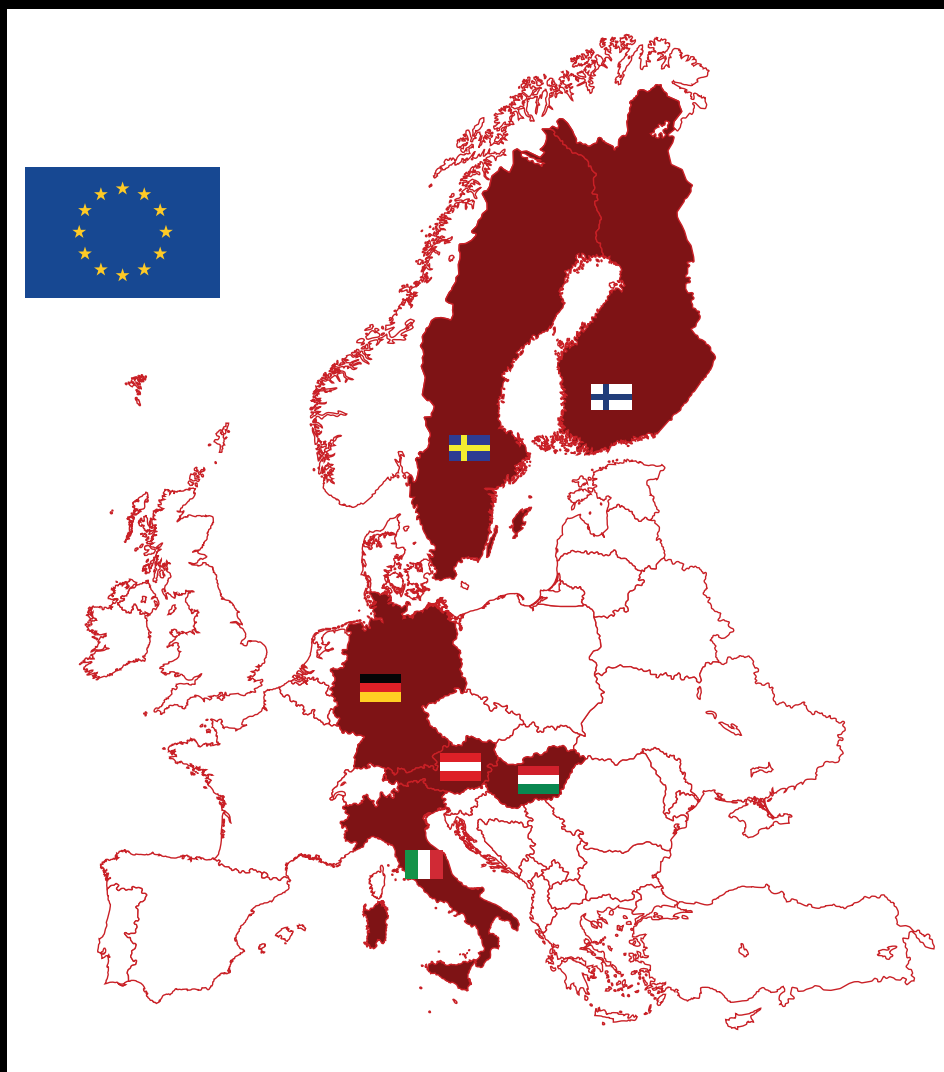


Figure 1: ADMONT Pilot Line Member States

cost, cycle time, quality and yield-competitive manufacturing solutions.

This will be demonstrated by establishing the workflow for qualification of several demonstrators for key applications like lab-on-chip for smart health & diagnostics, RFID transponder systems for smart

mobility, micro pump driver for smart energy and real time factory information system for smart production. The design of such smart systems will be supported by advanced design technologies enabling modelling and simulation of crucial MtM relevant aspects like reliability, lifetime, and the safe-operating-area (SOA) aspects.

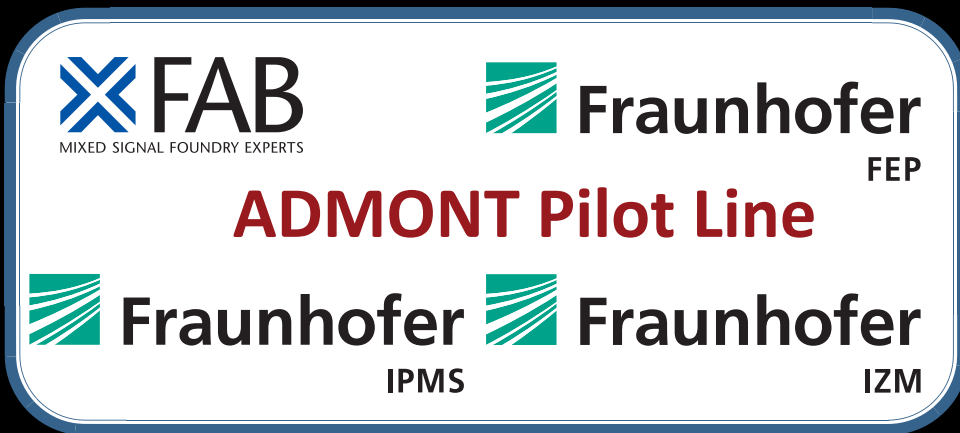


Figure 2: ADMONT Pilot Line Members

In combination with advanced modelling approaches for high-voltage devices and their characteristics, the pilot line will also focus on first-time-right design for the customer, which is a crucial aspect for time-to-market, especially for complex smart systems.

The pilot line is organised along the value chain from CMOS wafer processing with More-than-Moore 0.35µm high and ultra high-voltage and integrated sensor technologies at X-FAB Dresden, sensor processing and sensor material development at FhG-IPMS Dresden, organic

semiconductor materials and OLED processing at FhG-FEP and 2.5/3D silicon-system integration at FhG-ASSID.

The pilot line offers four distinct essential capability modules (ECM) at his four locations: CMOS capabilities, sensor actuator capabilities, organic capabilities and silicon system integration. The ADMONT pilot line is working as an open platform and customers can select and use single processes or technology modules or combinations of it from all capabilities for smart system integration.

The ADMONT pilot line aims for cost effective and energy efficiency production, robust and stabile processes, technologies and product diversification under MtM production with high yield and excellent quality under world-class environment.

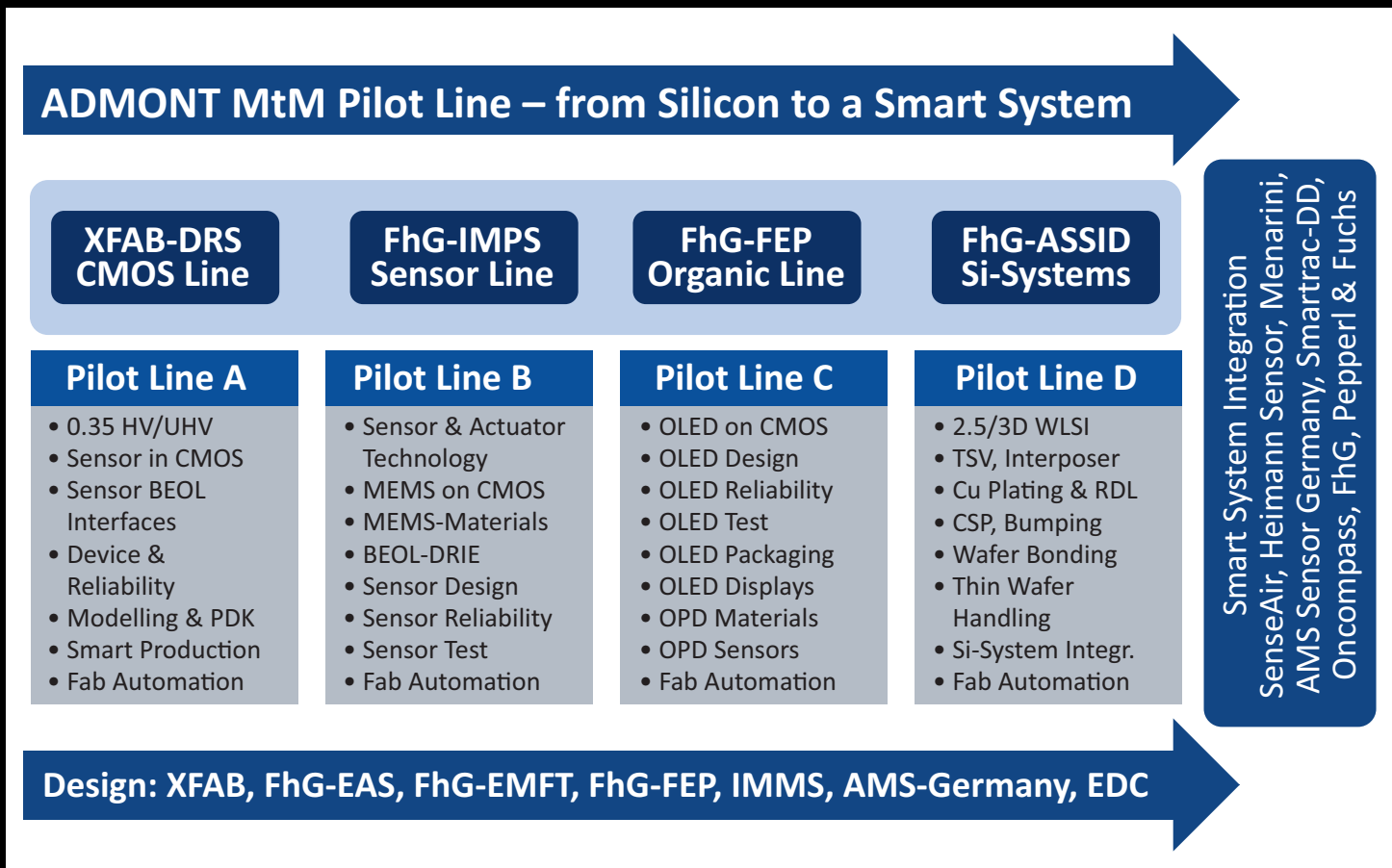


Figure 3: Pilot line members & user, essential capabilities



The ADMONT pilot line has been ready for prototyping and demonstrator preparation for project internal and external customer use since April 2017. The pilot line reporting, KPI review and continuous improvement programs are established and ongoing. The supply chain management concept, wafer transfer, fab interfaces and data exchange and aggregation systems are installed and working.

Over the complete pilot line lot tracking, cycle time management and process data collection is tested and established. A "line capability report" including key performance parameter (KPP) and progress of essential capabilities has been provided to all internal pilot line users. Important success criteria are the maturity of all demonstrator and prototypes regarding to the planned and reached technology readiness level (TRL). We are on track and most of our prototypes and



Figure 4: ADMONT team at 3rd EU review meeting in Dresden, June

demonstrators have the potential for production three to nine months after project completion.

We also see potential for a follow-up project and will continue the pilot line together in cooperation with FMD

ADMONT Key Application and Pilot Products

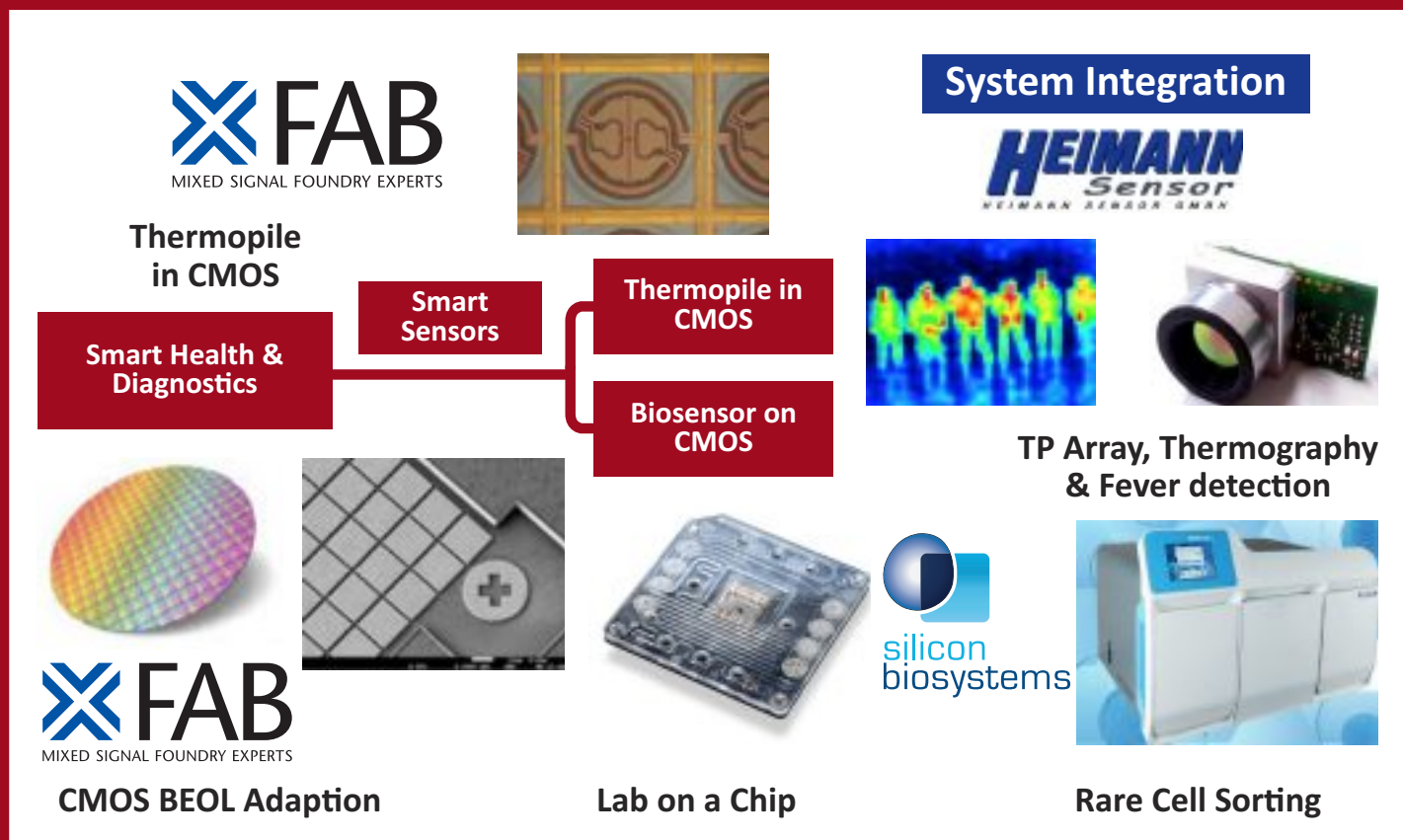


Figure 5: Example for ADMONT Pilot Line demonstrator and value chain



(Forschungsfabrik Mikroelektronik Deutschland). The FMD in Germany was founded in April 2017 and is a concept for a cross-location research factory for microelectronics and nanoelectronics. The goal is to combine the skills in a pool for technologies within the designated institutes. The existing ADMONT customers and partners can change to FMD and use the professional environment and services. FMD has a central contact office in Berlin.

The results from ADMONT are:

- One-stop-shop with one work flow, defined interfaces and fast cycle time for access to various MtM technologies and Si-system integration located in Dresden/Saxony.
- HV-CMOS process platform for sensor, actuator integration, optical devices and sensor interfaces for organic semiconductor, medical and diagnostics applications
- Design technology and next PDK generation for integration of analog, sensors, actuators, RF, power devices and new materials on CMOS in system

design flow by effort reduction and improved service quality.

- New sensor materials for next generation thermo-electric sensors and technology platform for CMUT integration in CMOS.
- Fab automation system by “Real-Time Factory Analysis and Control” and “Smart Intralogistic Automation Systems”.
- Sensor and actuator microsystem platforms for diagnostic and smart health solutions
- Prototypes and demonstrators addressing key application areas such as smart mobility, smart production, smart health and smart energy.
- ADMONT pilotline is working and open for external users.

In addition, we developed a pilot line for IR-sensor array calibration and a pilot line for handheld IR-gas sensor production. Both pilot lines are part of our prototype and demonstrator preparation for smart system integration and the interface to future market penetration with innovative products.

PROJECT SUMMARY

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PROJECT PARTNERS

Project Coordinator: X-FAB Dresden GmbH & Co. KG. **Partners:** Heimann Sensor GmbH, Okmetic Oy, Systema Systementwicklung Dipl. Inf. Manfred Austen GmbH, Fabmatics GmbH, Smartrac Technology GmbH, SenseAir AB, Menarini Silicon Biosystems S.p.A., AMS Sensors Germany GmbH, EDC Electronic Design Chemnitz GmbH, Technikon Planungs- und Forschungsgesellschaft mbH, Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., IMMS Institut für Mikroelektronik- und Mechatronik-Systeme GmbH, and OnCompass Medicine Hungary Korlatolt Felelossegu Tarsasag.

PROJECT LEAD PROFILE

X-FAB is the leading analog/mixed-signal and MEMS foundry group manufacturing silicon wafers for automotive, industrial, consumer, medical and other applications. X-FAB offers worldwide marketing and sales support for foundry business with production facilities in Asia, America and Europe.

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