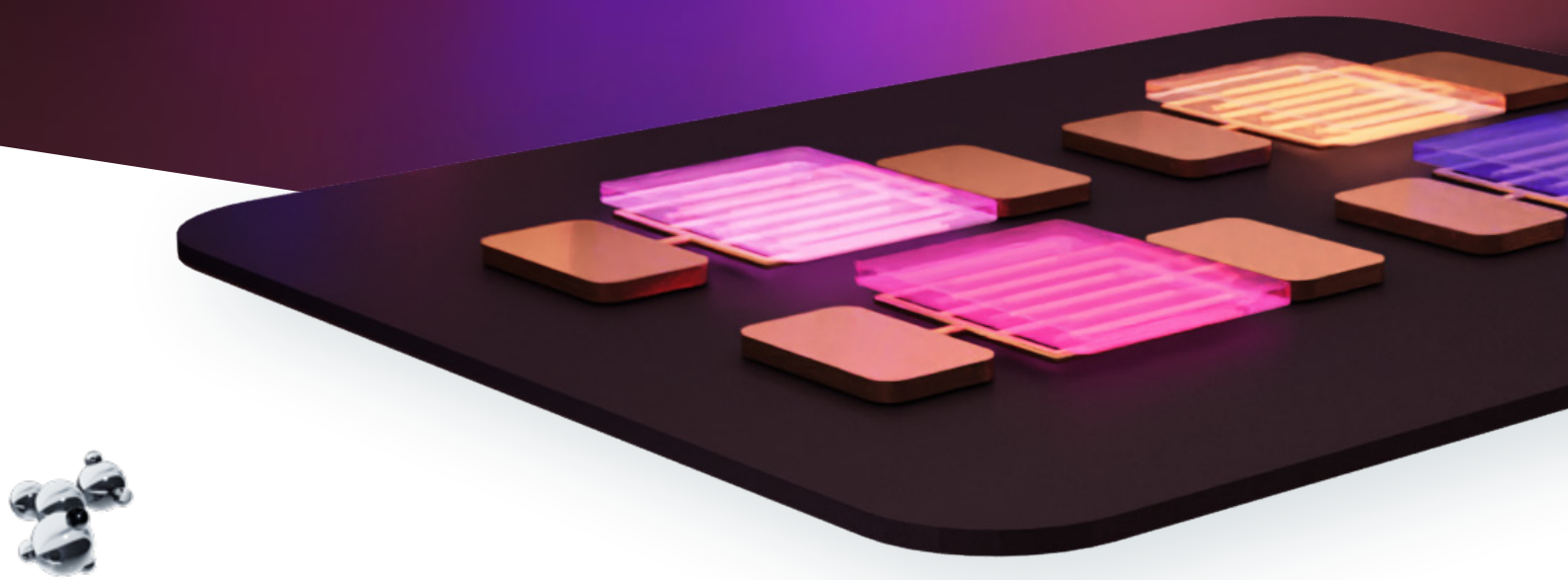
AMUSENS

NEWSLETTER ISSUE 01

Multi-pixel gas sensor platform

FOR A WIDE RANGE OF APPLIANCE AND CONSUMER MARKETS



amusens-horizon-europe-project

@HEU-AMUSENS

Message from the Project Management Team

The intention of this newsletter is to open a new communication channel to provide news on the project progress and to discuss ongoing topics relevant to AMUSENS. This newsletter is intended for internal and external project partners, stakeholders and all other interested bodies. For more detailed information about the project, we invite you to visit our project website, which is constantly updated with the latest project related news.

Funded by the European Union under grant agreement no. 101130159. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

AMUSENS Consortium at the Kick-off Meeting

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Kick-off Meeting in Luxembourg – September 2024

The AMUSENS kick-off meeting was successfully held in Luxembourg, kindly hosted by our coordinator, the Luxembourg Institute of Science and Technology (LIST). Over two dynamic days, project partners from across Europe gathered to discuss project details and establish a clear roadmap for the future.
The AMUSENS project aims to drive innovation across Europe, and the kick-off laid a strong foundation for the work ahead. Thanks to all partners for their commitment and contributions!

The AMUSENS Consortium

The AMUSENS consortium is driven by the goal of demonstrating a new approach for the realization of a low-cost and low power multi-pixel sensor platform with adaptable response to various gas environments. It consists of ten partners – including four highly qualified industry partners (ATLANT 3D Nanosystems ApS, JLM Innovation GmbH, Sciosense Germany GmbH, Ellona SAS), four high research ranked academic partners (Luxembourg Institute of Science and Technology, University of Liège, Universita degli studi di Brescia, Institut Mines-Telecom) and two experienced SMEs (Technikon Forschungs- und Planungsgesellschaft mbH, Science For Change, SL). With our strong team of industrial, academic, and research partners, we are convinced that AMUSENS will have a direct economic impact on the highly active segment of gas sensors for the consumer market on the one hand, and a direct scientific impact on high-level research in the field of gas sensors and artificial intelligence (AI) on the other hand.

Luxembourg Institute of Science and Technology
Luxembourg [Luxembourg]

Université de Liège
Belgium [Liège]

University of Brescia
Italy [Brescia]

Ellona SAS
France [Toulouse]

Technikon Forschungs- und Planungsgesellschaft mbH
Austria [Villach]

ATLANT 3D Nanosystems APS
Denmark [Taastrup]

Institut Mines-Télécom
France [Palaiseau]

Sciosense Germany GmbH
Germany [Reutlingen]

Science For Change, SL
Spain [Barcelona]

JLM Innovation
Germany [Tübingen]

Technical Update

The main objective of AMUSENS is to develop a low-power gas sensor platform with adaptable selectivity to different gas environments by combining metal oxide (MO) multi-pixel sensing approach and trained artificial intelligence (AI), and to demonstrate the adaptability to two use case applications chosen in the fields of personal environmental monitoring and health care. Here, we present an update on the work carried out so far to meet each objective of AMUSENS:

Objective 01

AMUSENS will start with the definition of targeted gases for the targeted applications and relevant MO structures for specific gas sensing, with the aim to build up a database for the choice of material combinations in the multi-pixel sensor.

Assessment of the status: A first selection of 12 target gases and 14 potential sensing materials have been selected based on a benchmark of bibliographic data and various selection criteria, including ability to perform the test for the gases, sensitivity, processability and stability for the materials (WP4). A more restricted selection will follow after the use case analysis (co-design activity, T6.5) and safety analysis for the sensing materials (T1.4). The performances of the sensing materials will be evaluated in WP6.

Objective 02

AMUSENS will develop new inks based on MO nanoparticles for local inkjet printing as well as DALP of thin films onto micro-hot-plate array for fast screening of materials and process parameters, and final device processing.

Assessment of the status: The partners have demonstrated the liquid-phase synthesis of 6 of the metal oxide nanostructures identified in Objective 1, and one material has been used to optimize the ink formulation, with a recipe that will be adapted to other materials (T5.1). First encouraging inkjet printing tests have been performed based on this ink and will be extended to all synthetized materials (T5.2). The deposition of 3 targeted coatings have been demonstrated by DALP® with the current resolution of 350 µm and other materials are under development (T5.3).

Objective 03

AMUSENS will develop specific AI for (1) fast material screening and (2) data fusion during the gas sensor training and measurement phases.

Assessment of the status: Preliminary AI algorithm has been designed. They will be benchmarked on data already available from commercial gas sensors.

Objective 04

AMUSENS will demonstrate a new multi-pixel gas sensor platform with a wider range of materials combination, low weight, low power consumption and high integration capabilities, combined with specifically design AI algorithm.

Assessment of the status: Not addressed yet (related to future WPs 7 and 8).

Objective 05

AMUSENS will demonstrate the performance of its gas sensing platform on monitoring individual exposure to pollutants and critical gases.

Assessment of the status: Not addressed yet (related to future WPs 8 and 10).

Objective 06

AMUSENS will demonstrate the performance of its gas sensing platform on monitoring biomarkers in exhaled breath.

Assessment of the status: Not addressed yet (related to future WPs 8 and 10).

Videos

All project-related videos are showcased on Vimeo.

Among other videos, there are partner interviews available, offering valuable insights into the project's goals and challenges. These interviews provide both technical and general information, shedding light on the innovative aspects of the project. They serve as valuable resources for understanding the project's objectives and the collaborative efforts of the consortium in overcoming obstacles.

Make sure to watch our explainer video too:

https://amusens.eu

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Past Events

Kickoff Meeting
09th - 10th September 2024
@Luxembourg

Upcoming Events

ISOCS Short Course Winter 2025
02nd - 07th February 2025
@Bormio, Italy

Published Papers

„Advanced wafer singulation techniques for miniaturized metal-oxide (MOX) micro-hotplates based gas analyzer“

Consortium: 10 partners (8 countries)
Project Coordinator: Luxembourg Institute of Science and Technology
Coordinator Support: Technikon Forschungs- und Planungsges. mbH
Project number: 101130159
Project website: https://amusens.eu/
Project start: June 2024
Project end: May 2028
Duration: 48 Months
Budget: EUR € 7,99 Million - 100% EU-funded
Follow AMUSENS on: Twitter, LinkedIn

For more information about the AMUSENS project, visit our website or contact the project management team:
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