

PRESS RELEASE

ENGLISH

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LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY (LIST)

The Luxembourg Institute of Science and Technology (LIST) is a mission-driven Research and Technology Organization (RTO) that develops advanced technologies and delivers innovative products and services to industry and society. As a major engine of the diversification and growth of Luxembourg's economy through innovation, LIST supports the deployment of a number of solutions to a wide range of sectors, including energy, IT, telecommunications, environment, agriculture, and advanced manufacturing at national and European level. Thanks to its location in an exceptional collaborative environment, namely the Belval Innovation Campus, LIST accelerates time to market by maximizing synergies with different actors, including the university, the national funding agency and industrial clusters.

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A TINY SENSOR WITH A MASSIVE IMPACT

LIST and STMicroelectronics work together to develop a technology that should enable us to monitor the presence of volatile organic compounds: pollutants that are all around us and affect our health.

Volatile organic compounds (VOCs) include many different substances that are typically found in products such as solvents, adhesives, paints and detergents. They can spread over significant distances from where they are emitted, resulting in direct and indirect impacts on the environment and on our health. Some VOCs are considered major pollutants and contribute to the formation of greenhouse gases. Prolonged exposure to VOCs can cause health problems including headaches and dizziness, eye irritation, skin, nose and throat, and even respiratory problems.

A global player in the semi-conductor market joins forces with LIST

LIST has been working with [STMicroelectronics](#), a global semiconductor leader that develops, manufactures and markets electronic chips (semi-conductors) and integrated sensors. Some of these sensors can measure temperature, pressure or gas presence. Among others, these sensors are used in mobile phones and on-board electronics for aeroplanes and cars. "We are pleased to collaborate with LIST on VOC detection sensors leveraging LIST's recognised experience in the development of new Materials and Technologies and our extensive sensor expertise", said Giuseppe Bruno, Innovation Product R&D Design Manager at STMicroelectronics.

The aim of the joint project, which is supported by the [FNR](#) through the BRIDGES programme, is to create a sensor enabling the detection of VOCs by the end of 2022, with a view to incorporating the technology into Personal Electronics products and Smart Home and Building Automation applications.

Unique technology developed by LIST

The development of this tiny sensor, with a size smaller than one square millimetre, will rely on two Materials technologies developed by LIST. LIST has already proven some concepts of unique low power gas sensor technology relying on a specific Materials architecture. The challenge is now to combine these two technologies and integrate them into the research undertaken by STMicroelectronics. "It is an honour for LIST to collaborate with one of the world-leading semiconductor companies. This is a strong recognition of our capabilities to accelerate our autonomous IoT roadmap launched two years ago in our Materials Research and Technology –MRT Department", said Dr Damien Lenoble, Director of MRT.

Public health and big data

The incorporation of selective, sensitive and durable miniaturised gas sensors into personal electronics and Smart-Home and Building-Automation applications will enable users to monitor air quality both indoors and outdoors, thanks to localised, reliable and sustainable real-time readings. Depending on the outcome, users can take simple measures to minimise their exposure, such as improving ventilation by opening doors and windows.

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The development of this technology will undoubtedly pave the way for the creation of a relatively dense network of dispersed pollutant sensors, making it possible to monitor and analyse air quality on a wide scale.

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