People spend more than 80 % of their time indoors where fresh air exchange is increasingly limited to reduce energy consumption.

SENSIndoor will measure the quality of indoor air.

Indoor air pollution contributes significantly to the global burden of disease.

SENSIndoor will develop smart, energy efficient ventilation systems.

Continuous ventilation would greatly increase energy consumption for HVAC (heating, ventilation, air conditioning) systems.

SENSIndoor will bring forth demand controlled ventilation – the key for energy efficient buildings.

Low-cost sensor systems are required to provide ubiquitous IAQ monitoring.

SENSIndoor will develop novel nanotechnology-based microsensor systems for room specific ventilation.

SENSIndoor is based on an initiative developed within the COST Action TD1105 EuNetAir.

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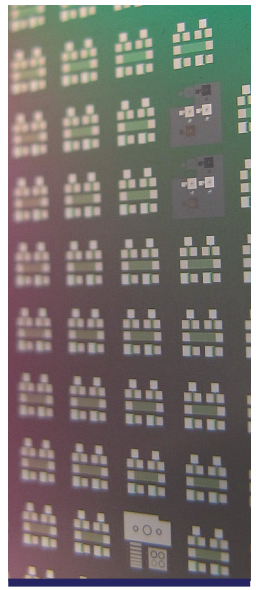
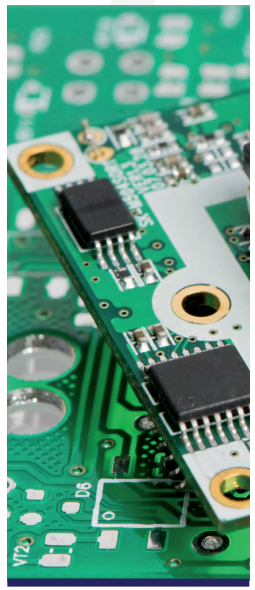
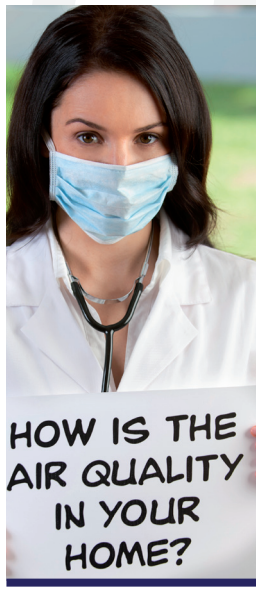
SENSIndoor







Nanotechnology-based intelligent multi-SENsor System with selective pre-concentration for Indoor air quality control

www.SENSIndoor.eu

The SENSIndoor project is funded by the European Commission under the Seventh Framework Programme.

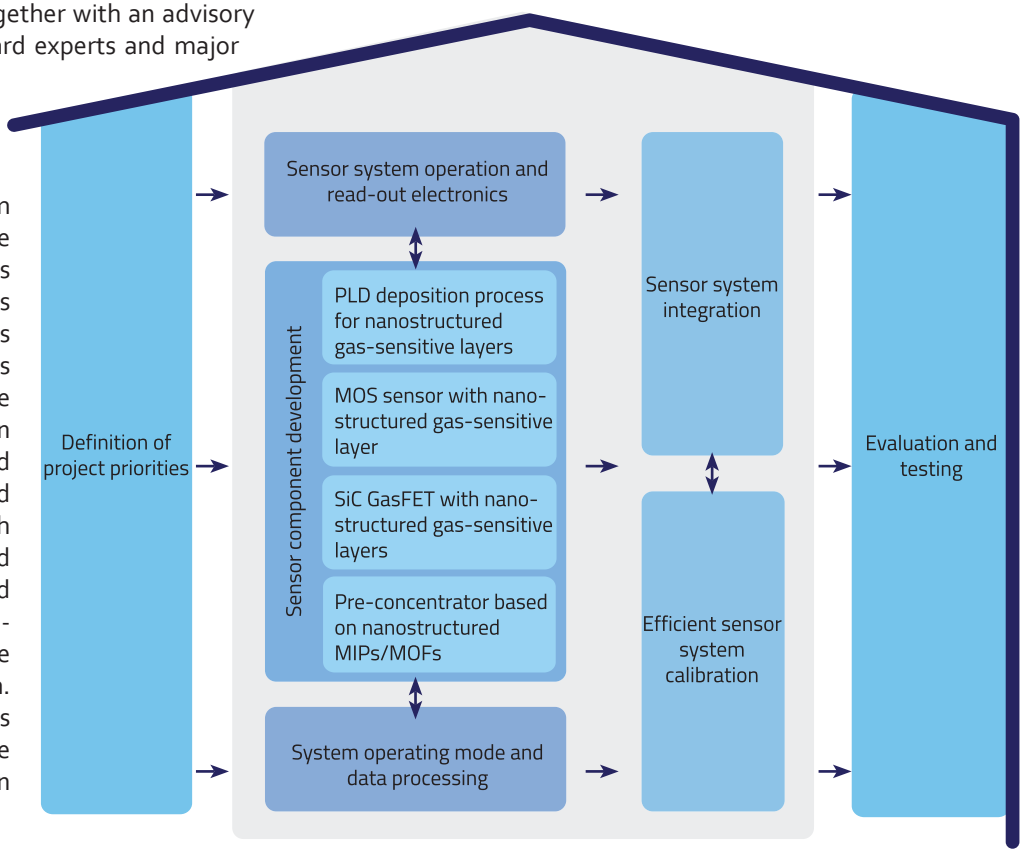
Project Summary

SENSIndoor aims at the development of novel nanotechnology based intelligent sensor systems for selective monitoring of Volatile Organic Compounds (VOC) for demand controlled ventilation in indoor environments.

Greatly reduced energy consumption without adverse health effects caused by the Sick Building Syndrome requires optimized ventilation schemes adapted to specific application scenarios like offices, hospitals, schools, nurseries or private homes. These must be based on selective detection and reliable quantification of relevant VOCs such as formaldehyde or benzene at ppb or even sub-ppb levels in complex environments. Priority scenarios and corresponding target gases and concentrations will be defined together with an advisory board representing health standard experts and major industrial stakeholders.

The project addresses two sensor technologies with Micro-Electro-Mechanical System (MEMS)-based metal oxide semiconductor (MOS) gas sensors and Silicon Carbide-based gas sensitive field effect transistors (SiC GasFET). Gas sensitive layers for both sensor technologies are realized by Pulsed Laser Deposition (PLD) for well-defined, stable and highly sensitive nanostructured layers. These are combined with gas pre-concentration based on MIPs (molecular imprinted polymers) and MOFs (metal-organic frameworks) to boost the sensitivity of the overall system. Dynamic operation of the gas sensor elements by temperature cycling combined with pattern recognition techniques is employed to further boost sensitivity and selectivity and expanded to optimally use the gas preconcentration. The project thus combines physical and chemical nanotechnologies for extremely sensitive and selective gas sensing, MEMS technologies for low-power operation as well as low-cost manufacture and finally dynamic operating modes together with advanced signal processing for unrivalled system performance. Sensor elements and systems are evaluated under controlled lab conditions derived from priority application scenarios.

The final demonstration of the **SENSIndoor** technology will include field tests with sensor systems integrated into building control systems.



Fact Sheet

Acronym
SENSIndoor

Full Title
Nanotechnology-based intelligent multi-SENsor System with selective pre-concentration for Indoor air quality control

Programme
7th Framework Programm of the European Commission - NMP - Small or Medium-sized Collaborative Project

Duration
36 months (start date: January 2014)

Project Funding
3.399.995,00€

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