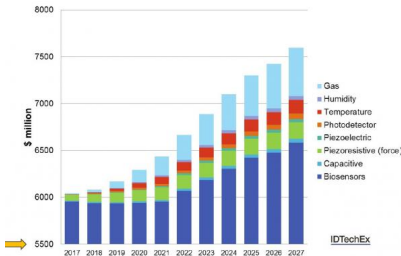


Personalized cosmetics: a low-hanging fruit for printed biosensors

April 10, 2018 // By Julien Happich

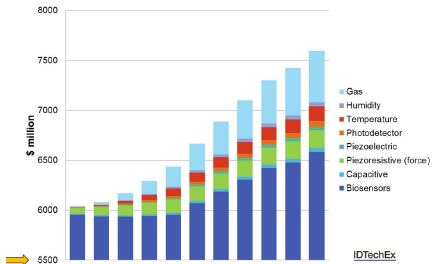


Although AFELIM members gathered in Paris under the general theme "printed sensors", the focus was clearly on biosensors during the "Rencontres électronique imprimée".

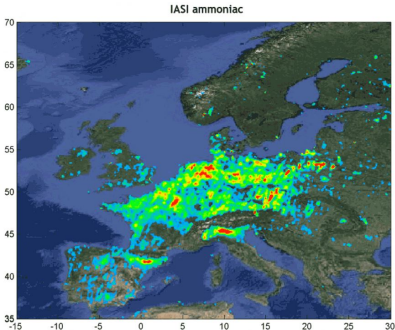
According to IDTechEx's, biosensors is the biggest market segment of printed sensors simply because of the multi-billion dollar market that represent blood glucose sensors shipping as billions of disposable test strips used every year for diabetes monitoring. But gas sensors are expected to become the second largest segment according to the market research firm. And there is much more to blood glucose monitoring or environmental sensing, as the speakers revealed in their presentations.

Jean-Luc Wojkiewicz from IMT-Université de Lille sees environmental sensing and pollution monitoring as a huge market for printed biosensors, his lab being very active in the development of hybrid nano-compounds and biopolymers for electronic gas sensors.

Wojkiewicz cited an OMS estimate that about 7 million death per year can be attributed to air contamination, with ammonia (NH₃) being one of the most underreported contaminants coming mostly from agriculture (for 93.7%) and industrial processes. But many other contaminants including H₂S,



Source: IDTechEx report "Printed and Flexible Sensors 2017-2027: Technologies, Players, Forecasts"



Satellite observation by the IASI mission for each March month (fertilizer application periods) from 2008 to 2015. Source Martin Van Damme / Université Libre de Bruxelles.

amines, volatile organic compounds (VOCs), O₃, CO, CO₂ to name a few also need to be monitored outdoor and indoor in real time, calling for compact and cheap sensors. This is where printed biosensors, which can be formulated with conductive polymers to detect many gases, can give a very fine monitoring mesh (in the meter pitch compared to kilometre-wide satellite observations).

"With one litre of solution, you can fabricate several millions of sensors, the cost of the active surface of the sensor becomes negligible", Wojkiewicz highlighted, sharing the details of a typical resistance-based sensor layout with comb electrodes and a tiny drop of tuned polymer whose conductivity is impacted by the adsorption of analytes.