European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir*

COST Action TD1105

WGs and MC Meeting at Cambridge, 18-20 December 2013

Action Start date: 01/07/2012 - Action End date: 30/06/2016

Year 2: 1 July 2013 - 30 June 2014 (*Ongoing Action*)

INSTITUTE OF TECHNOLOGY
LINKÖPINGS UNIVERSITET

Mike Andersson

Function in the Action (WG Member, Sub-WG Leader, SIG or WG Leader, Chair)

Affiliation / Country

cost
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

EuNetAir
European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability

COST is supported by the EU Framework Programme

ESF provides the COST Office through a European Commission contract

Scientific context and objectives in the Action

- **Background / Problem statement:**

  The development of sensors for emissions as well as environmental monitoring based on the field effect device platform

- **Brief reminder of MoU objectives:**

  Research into devices and device platforms/ sensor systems – WG2

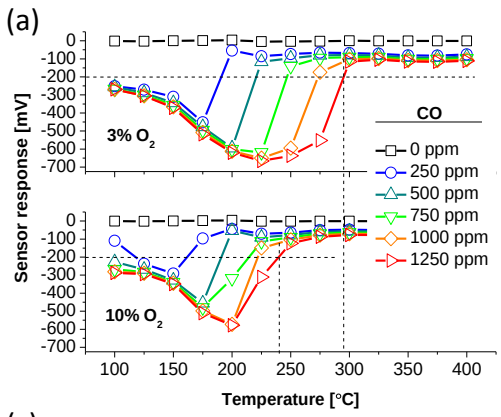
Current research activities

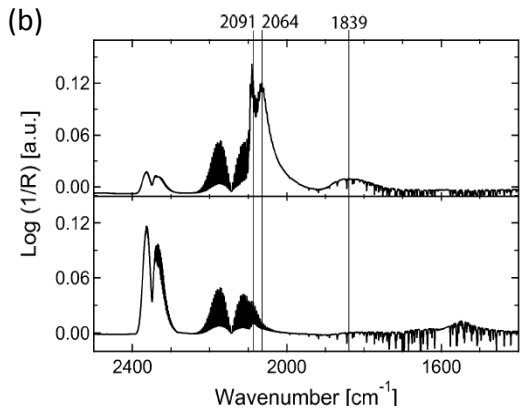
- **Current research topics at the partner organization / Problem statement:**

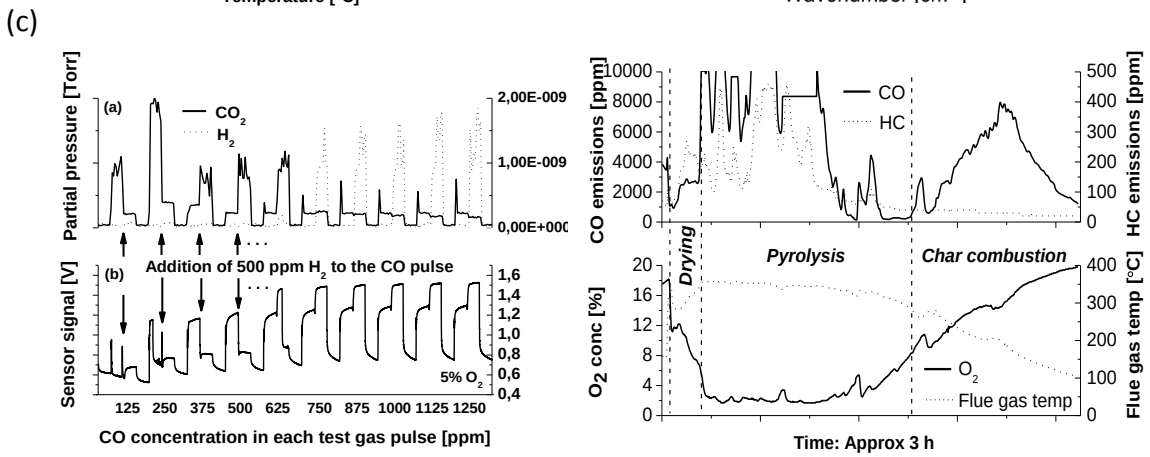
  Research centered on the understanding of materials interaction, device design and packaging for sensitive, selective and long-term stable sensors for emissions and environmental monitoring

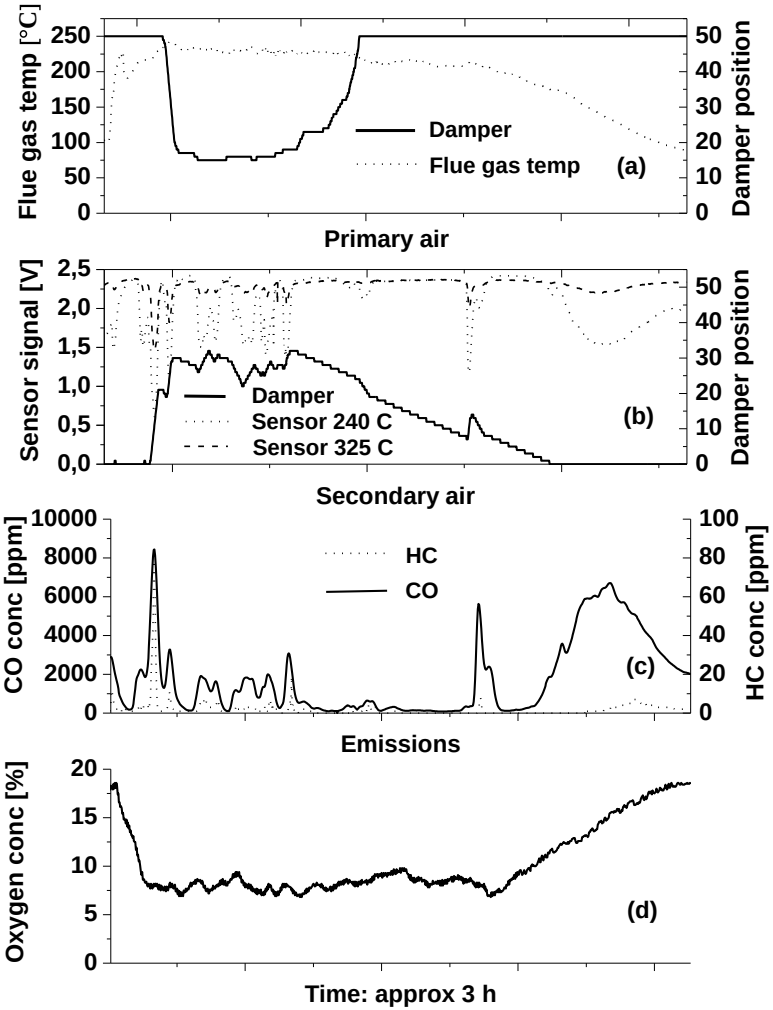
- **Brief list of ongoing research topics of the Partner:**
  - Materials/devices for NO_x sensing
  - Materials/devices for SO_x sensing
  - Investigations on PM measurements for AQ assessment
  - Investigations on VOC measurements for indoor AQ
  - Investigations on materials and packaging for HT applications

Emissions monitoring for combustion control

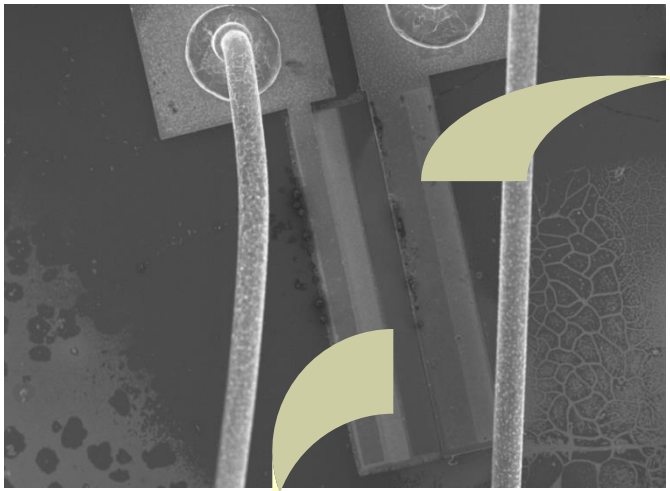


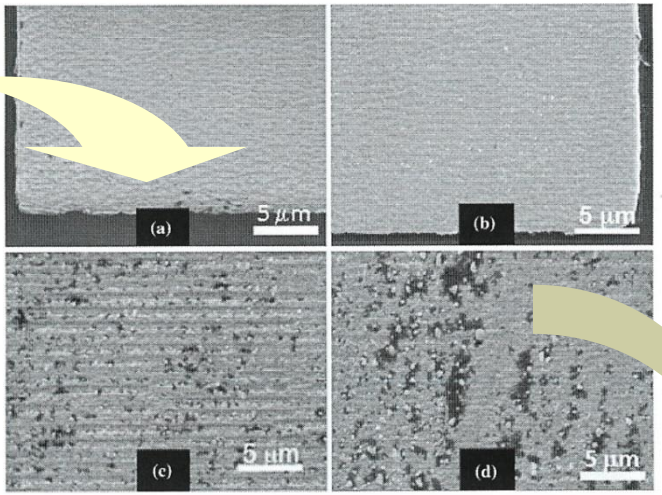


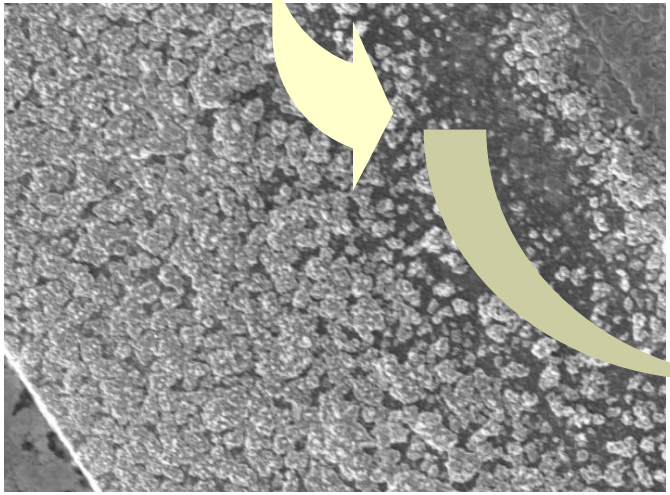


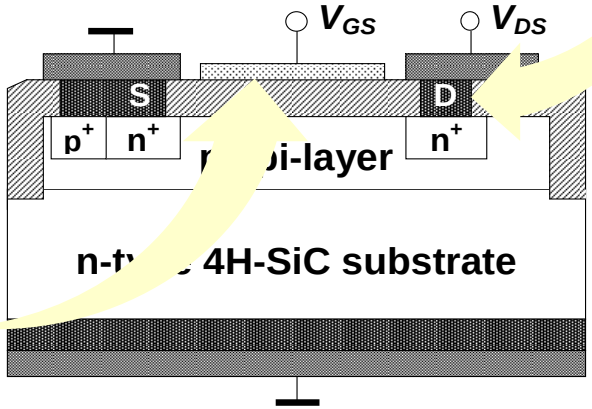


Challenges – materials interaction / stability



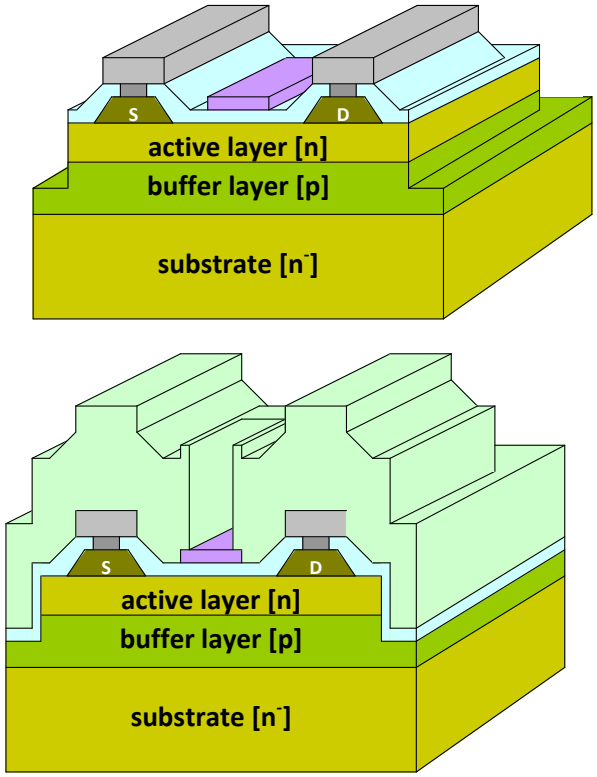


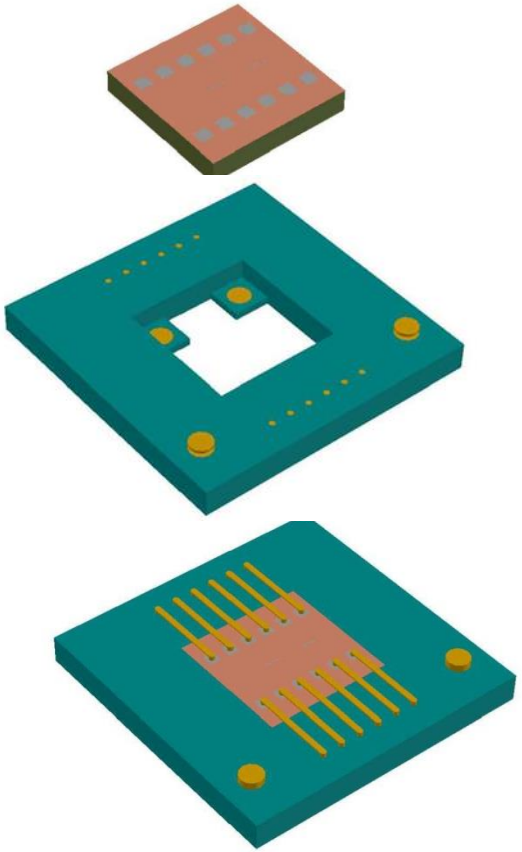


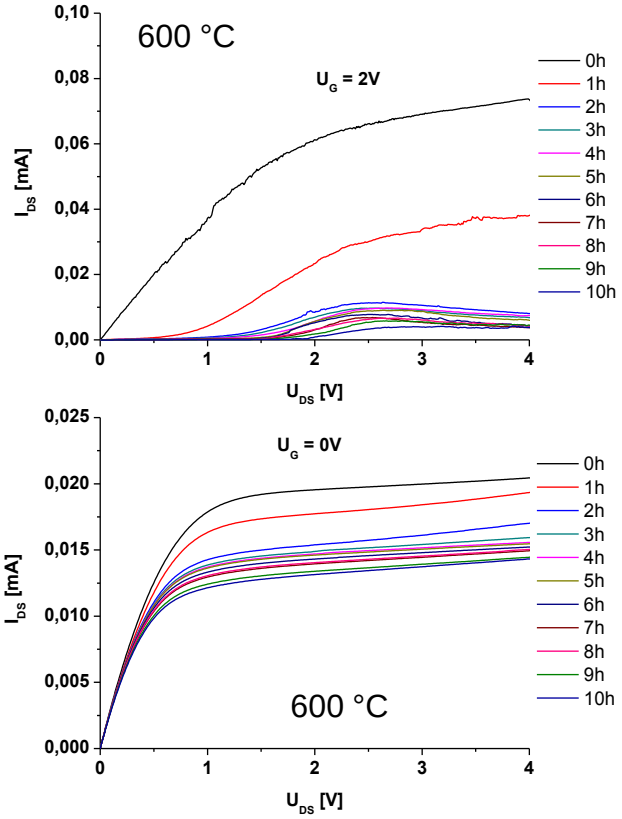


Encapsulation and packaging

In cooperation with Microelectronics and Materials Physics Laboratories, Oulu University, Finland







Research Facilities

- **Research Facilities:**
- Materials deposition; Sputter systems, Evaporation systems, CVD
- Materials characterization; XRD, AFM, SEM, TEM, XPS, AES
- Electrical characterizations; SourceMeters, LCR meters, probe stations
- Gas characterizations; Gas test benches (up to 10 different gases at a time), Mass spectrometry, Environmental AFM, Environmental Kelvin Probe

Suggested R&I Needs for future research

- **Research directions as R&I NEEDS:**
- Need for research and innovation to reach a really low-power, autonomous sensor platform, e.g. by *power-up* and communicating data *only during* certain *gas exposures.*
- Need for research (hopefully) leading to innovations regarding a better understanding of different long-term degradation processes
- Need for research and innovation regarding issues such as fault detection and autonomous calibration.