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

COST Action TD1105

01/07/2012 - 30/06/2016

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Gas detection

we use many technologies

- Electrochemical
- Infra-red and UV spectroscopy
- MEMS and now polymer substrates
- Nanometals, CNT
- Metal oxides
- imprinted polymers

New factory: finished 2008

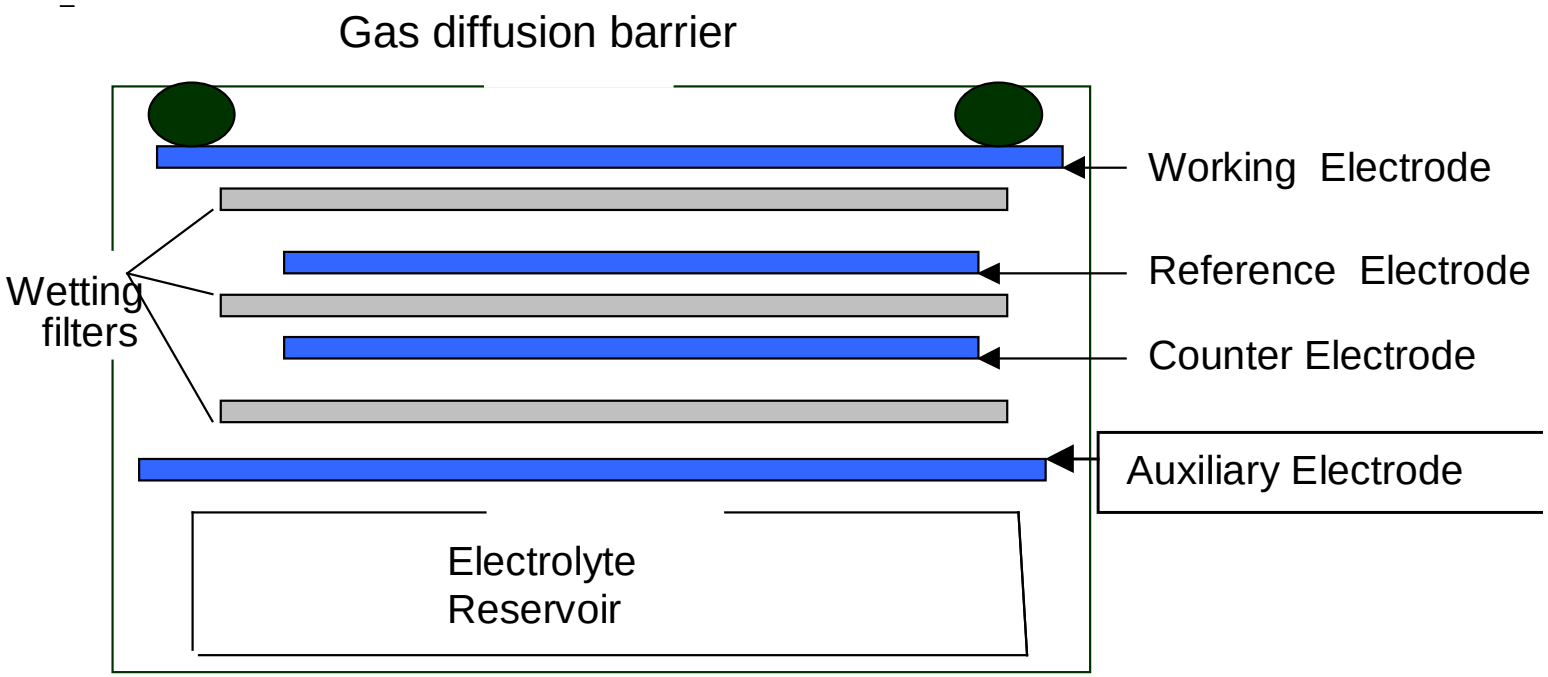
250 solar panels

installed 2012

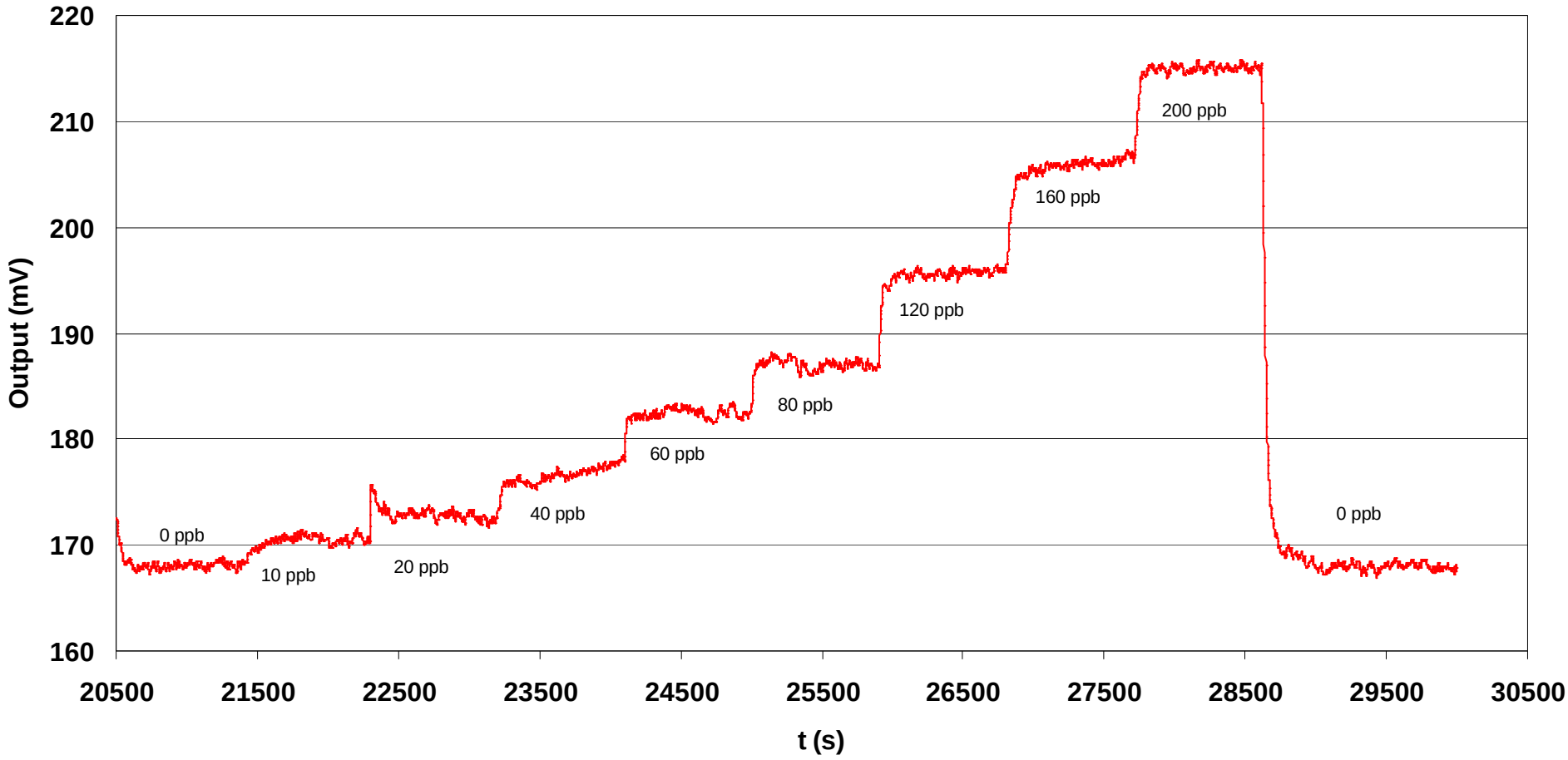
New Air Quality Sensors

- Metal oxide for high temperature H_2S
- ppm NDIR for methane
- PID- optimised for BTEX
- **ppb electrochemical family for air quality (NO, NO_2, CO, O_3, H_2S, SO_2)**

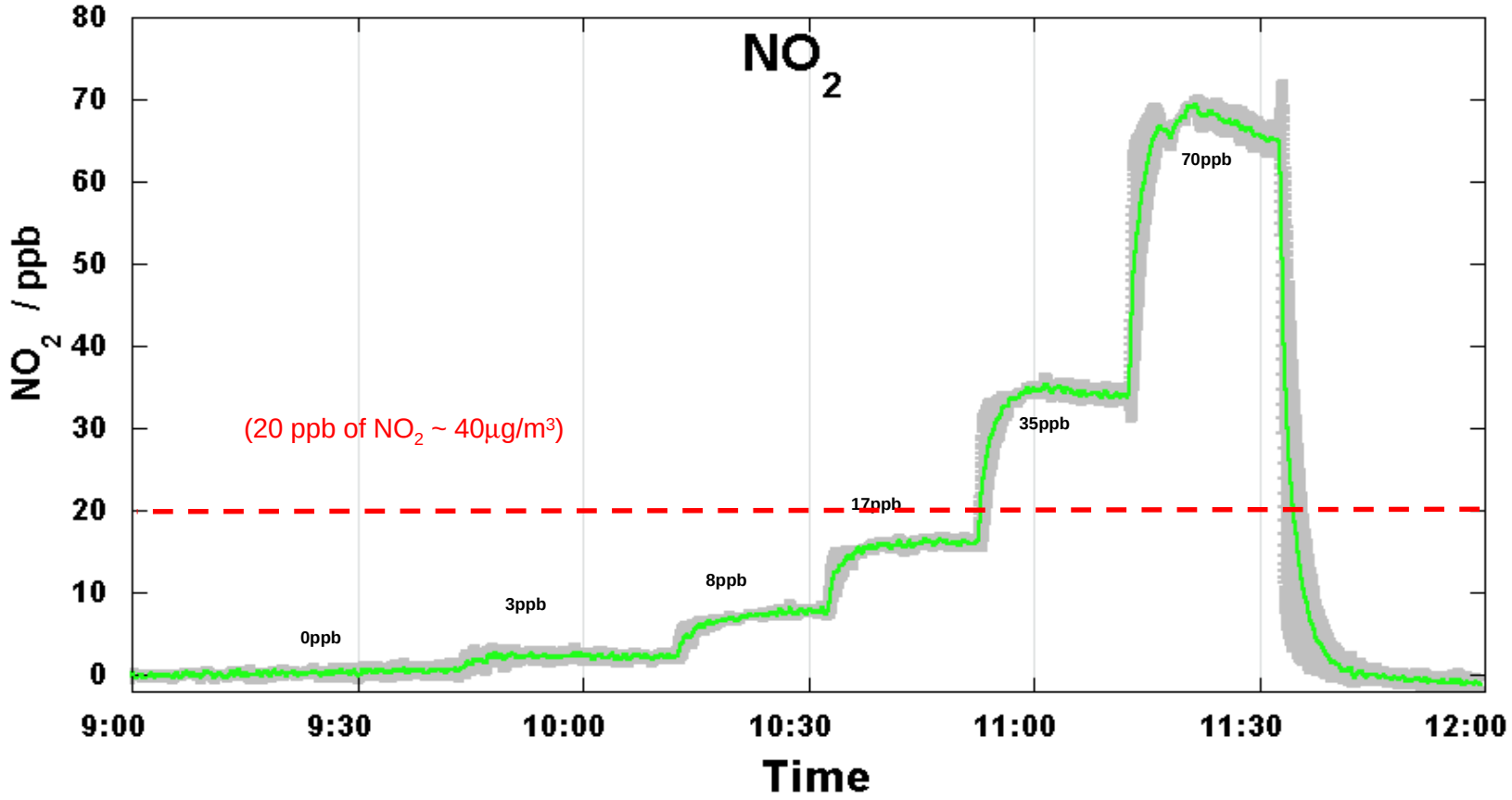
4- electrode amperometric electrochemical gas sensor



NO_2 up to 200 ppb in Alphasense lab



Performance after Cambridge algorithms are applied



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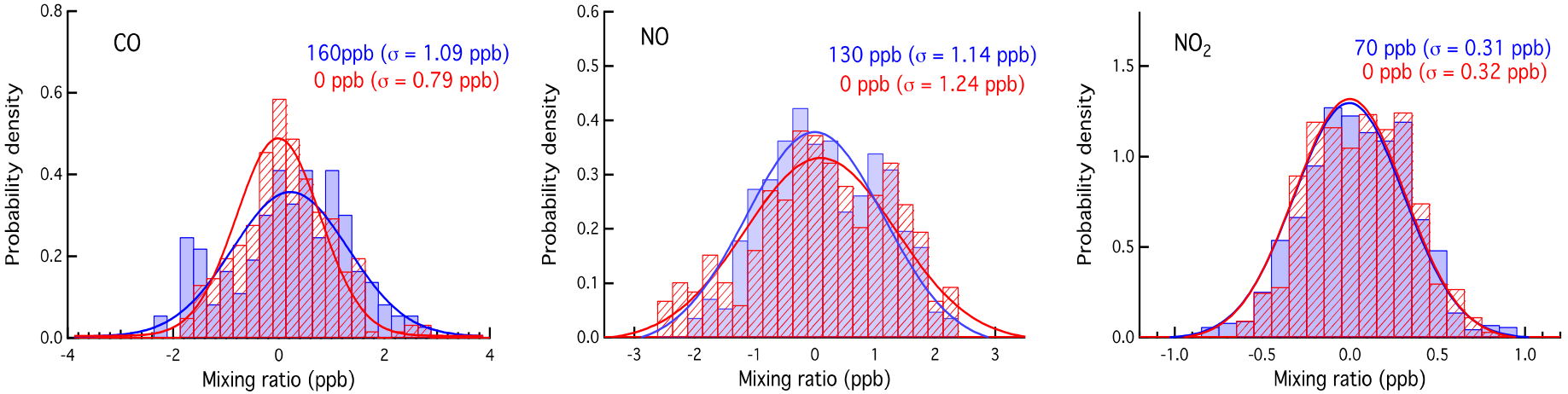
Electrochemical sensor CO/NO/NO_2 LoD performance (Cambridge laboratory)

Noise characteristics:



- Typical sensor LoD are < 5ppb (< 7μg/m^3) for CO,
  1-2 ppb (~2-4 μg/m^3) for NO and NO_2.
- SO_2, O_3 have comparable performance to NO_x.
- Typical sensor T_{90} ~ 10-20s (in diffusion mode)

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Electrochemicals are good

- Low cost
- Good stability
- Selective and stable baseline
- No power, room temperature operation

Conclusions

- Electrochemicals can meet the ppb requirements for air quality. Plus low cost, very low power.
- We need very good electronics and responsible post-processing to achieve required measurement quality
- Interferents and long term stability will continue to improve. The science is being done.