Workshop "Accurate Monitoring of Surface Ozone"
05 – 09 October 2020

AQUILA and the EU National Reference Laboratories

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Joint Research Centre
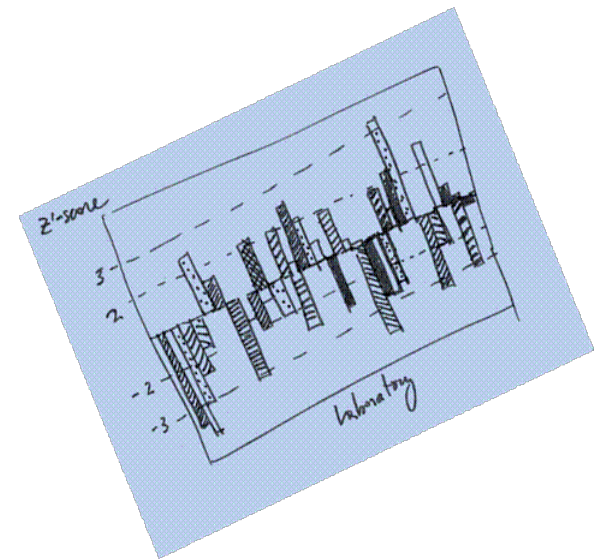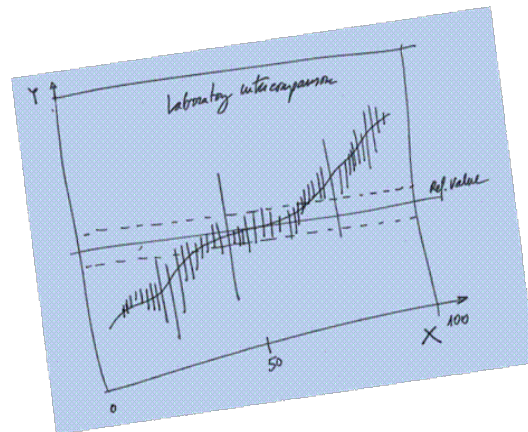*Directorate for Energy, Transport & Climate*

European Commission

Structure of presentation

JRC and ERLAP

Inter-laboratory Comparisons at EU level

The AQUILA Network

Possible implications & outlook

European Commission

JRC mission

As the science and knowledge service of the Commission our mission is to support EU policies with independent evidence throughout the whole policy cycle.

*Headquarters in **Brussels** and research facilities in **5 Member States:***

- *Belgium (Geel)*

- *Germany (Karlsruhe)*

- *Italy (Ispra)*

- *The Netherlands (Petten)*

- *Spain (Seville)*

PETTEN

BRUSSELS

GEEL

SEVILLE

KARLSRUHE

ISPRA

European Commission

JRC's European Reference Laboratory for Air Pollution

- Gives scientific and technical support the correct implementation and the development of European air policy.

- Research activities related to new measurement and assessment techniques.

- Harmonisation activities – quality assurance programmes, proficiency testing for EU National Air Quality Reference Laboratories.

- Accreditation ISO/IEC 17025 and 17043

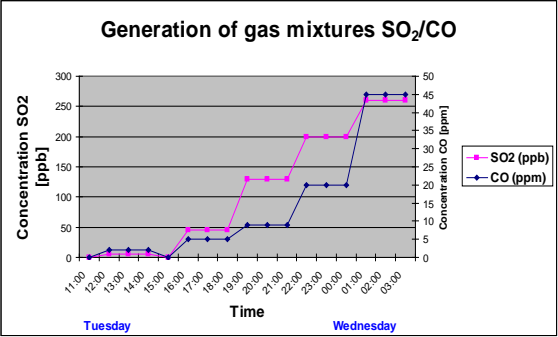 & participating in relevant BIPM/GAWG key-comparisons

JRC inter-laboratory comparison facility: dynamic dilution of air pollutant gas mixtures at ambient air levels and EU limit value concentrations
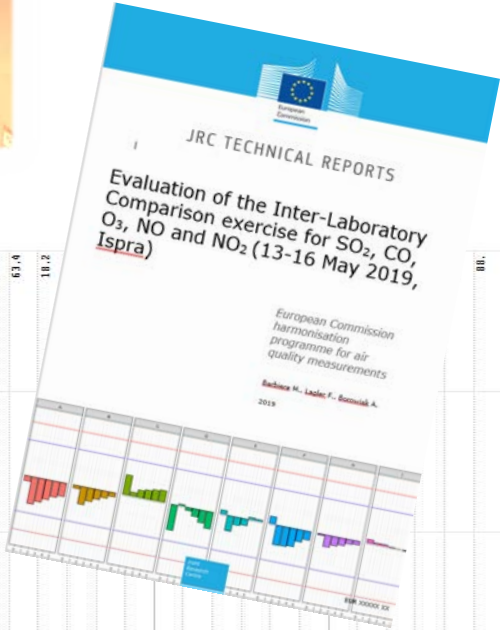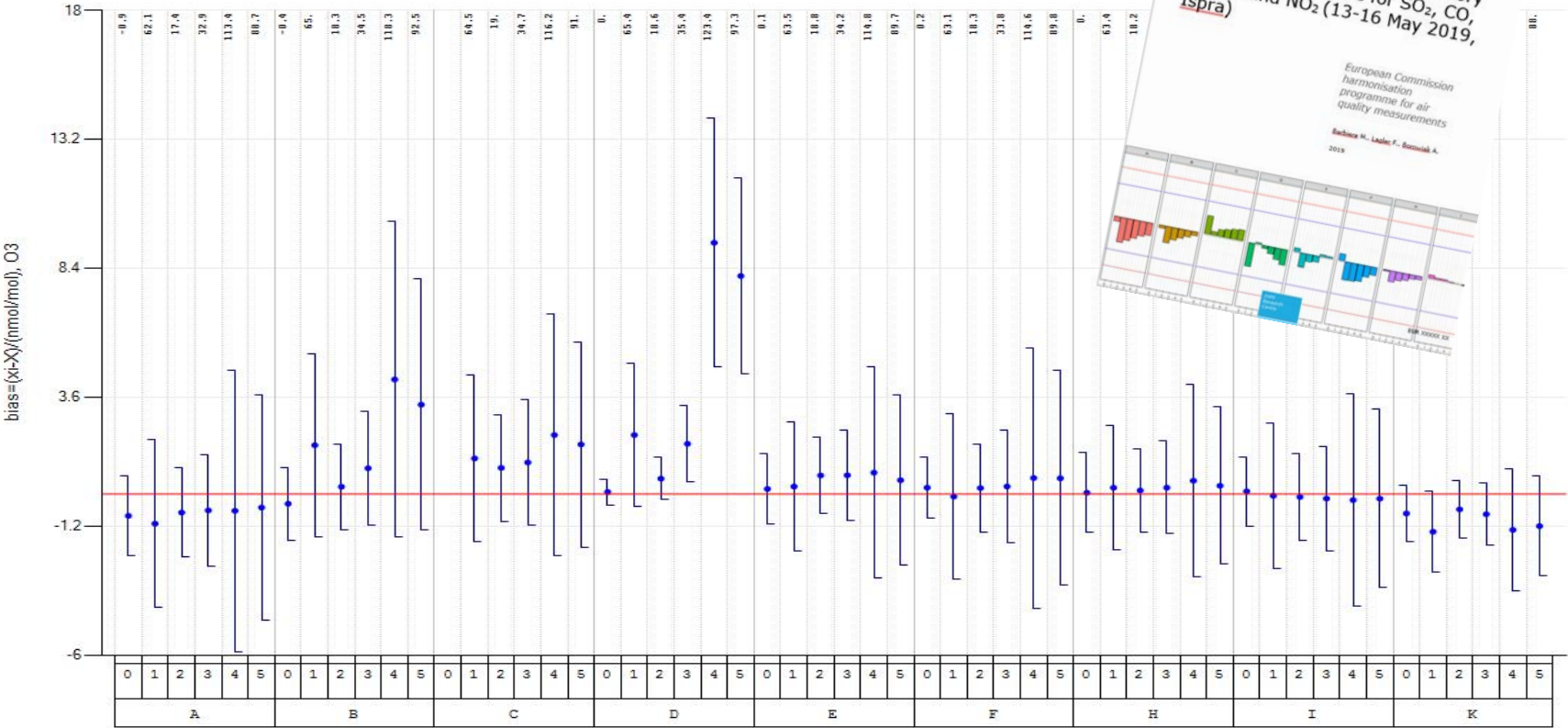

Generation of gaseous air pollutants: O_3, NO/NO_2, CO, SO_2, BTEX, other VOC

European Commission

Intercomparison gaseous compounds

Generation of gas mixtures SO_2/CO

Example (2019): Bias of participant's O_3 measurement results

JRC TECHNICAL REPORTS

Evaluation of the Inter-Laboratory Comparison exercise for SO_2, CO, O_3, NO and NO_2 (13-16 May 2019, Ispra)

European Commission harmonisation programme for air quality measurements

bias=(xi-X)/(nmol/mol), O3

Inter-comparison PM2.5/PM10 at JRC Ispra

Possibility for subsequent PAH and metal analysis

European Commission

AQUILA: background

Article 3 (2008/50/EC): Responsibilities

For the implementation of this Directive, the Member States shall designate at the appropriate levels the competent authorities and bodies responsible for:

- Assessment of ambient air quality,
- Approval of measurement systems (methods, equipment, networks, laboratories),
- Ensuring accuracy of measurements,
- Analysis of assessment methods,
- Coordination on their territory of Community-wide quality assurance programmes organized by the Commission,
- Cooperation with other MS and the EC.

& further details in annexes of Directives

Tasks of National Reference Laboratories: *Verify and support the correct implementation of AQDs*

- Implementing a quality system in the laboratory.
- Approving measurement systems (instruments, laboratories, networks)
- Ensuring the traceability of the measurements at national level,
- Participating in EC QA/QC programmes
- Exchanging information through the organisation of training sessions, workshops, conferences and guidance documents

join forces in AQUILA Network

AQUILA Network creation in 2001

Network Members: 37 National Reference Laboratories from the 27 Member States & EFTA

Observers & Associates: EEA, WHO, Candidate Countries, ….

Secretariat and chair: JRC

Steering Group: JRC, DG ENV, NRL representatives.

Restricted CIRCABC site for members

https://ec.europa.eu/jrc/en/aquila

Examples of AQUILA support to implementation of air quality policy:

- Co-organisation of conferences and workshops (e.g. equivalence, sensor performance, …)

- Organisation of training (e.g. measurement uncertainty)

- Contribution to reference material development (metals, PAH, ions)

- Production of documents/guidelines on topics of interest (guidance on equivalence, uncertainty Average Exposure Indicator, …)

- Input to review of Air Policy (2011 – 2013)

- Strong link with CEN standardisation

JRC - AQUILA harmonisation activities

- Regular inter-comparison exercises for NO/NO_2, O_3, SO_2, CO.

- VOC round robin tests (gas cylinder).

- BTEX inter-comparisons.

- OC/EC inter-comparison (in collaboration with ACTRIS).

- Metal inter-comparison (Pb, Cd, As, Ni).

- PAH intercomparison.

- PM10 & PM2.5 QA/QC programme.

Assumption: a newly established ozone cross section would result in a systematic increase of about 2 %[*] in ozone concentrations.
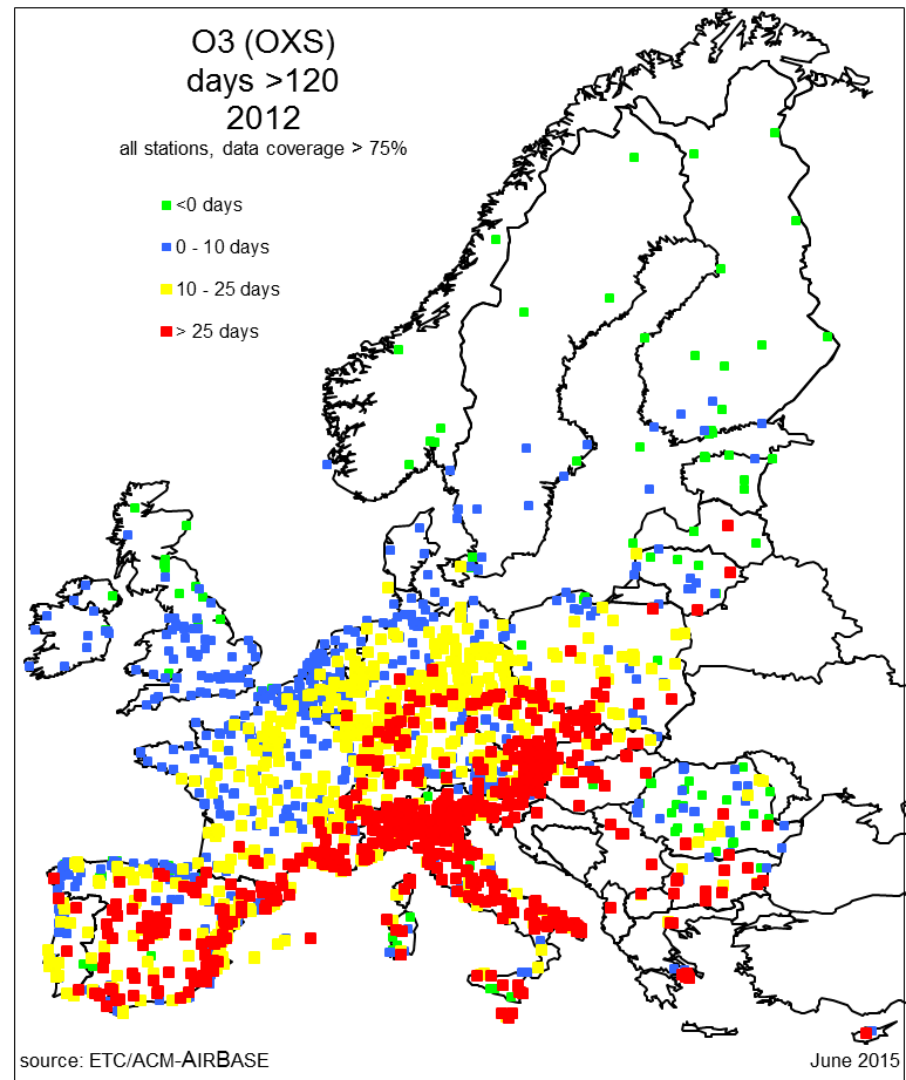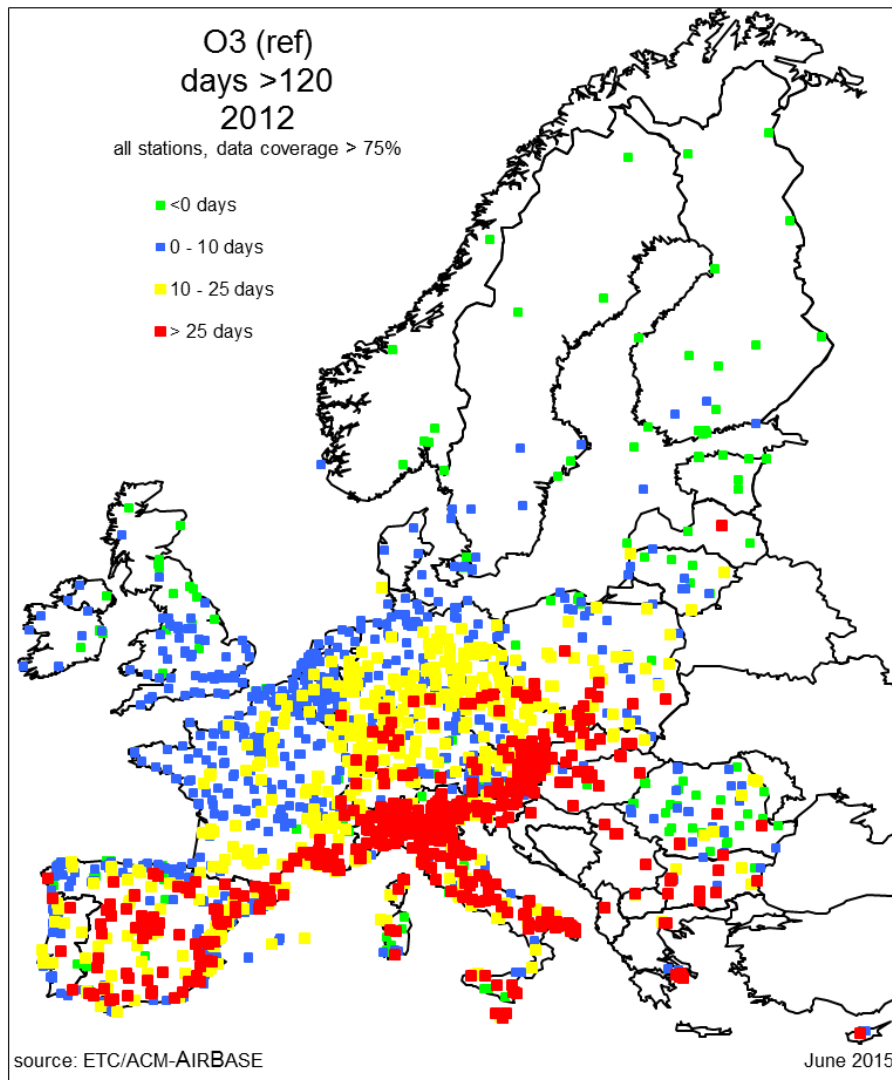
Implications: reduced compliance

	Increase number of exceedances	**Increase number of exceeding stations**
Alert threshold (240 µg/m^3)	34 %	28 %
Information threshold (180 µg/m^3)	33 %	17 %
Target value (8 h 120 µg/m^3):	17 %	25 %

Source: Frank De Leeuw (2018), ozone data 2003 - 2012

(*) now: 1.2 %

European Commission

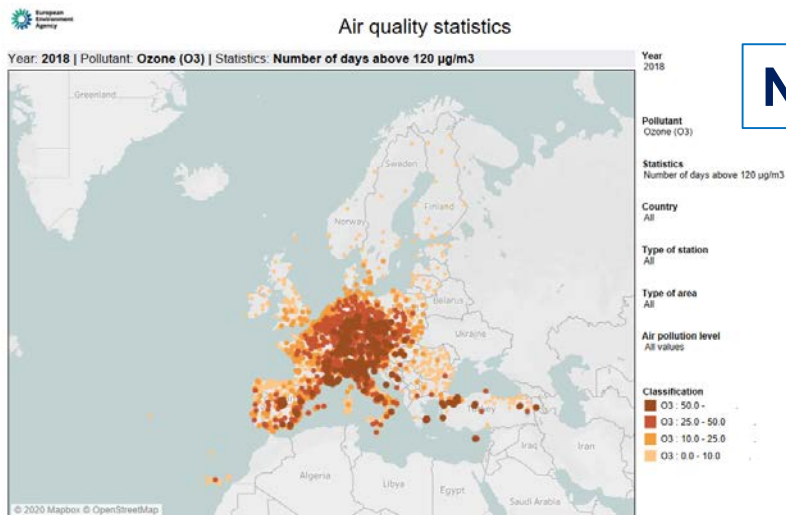# Target value health protection (8 h 120 µg/m^3)

Source: Frank De Leeuw (2018)

European Commission

According to EEA-ETC assessment period 2000 to 2017:

- 10 % decrease in ozone peaks.
- No clear trend for annual mean.
- Precursors NMVOC and NOx emissions decreased by 47 % and 53 %.

New evidence for health effects
(ongoing update WHO Air Quality Guidelines):

- Reinforced evidence for health impacts of short-term exposure to ozone.
- Evidence as well for long-term exposure health effects.

Need for accurate monitoring of ozone

European Commission