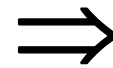




Blue skies are not enough: AQ regulations for PM – current design, progress achieved and future needs



Ruhr district, Jan. 1982



Ruhr district, 2010
(culture capital of Europe)

AirMonTech Workshop, March 2013

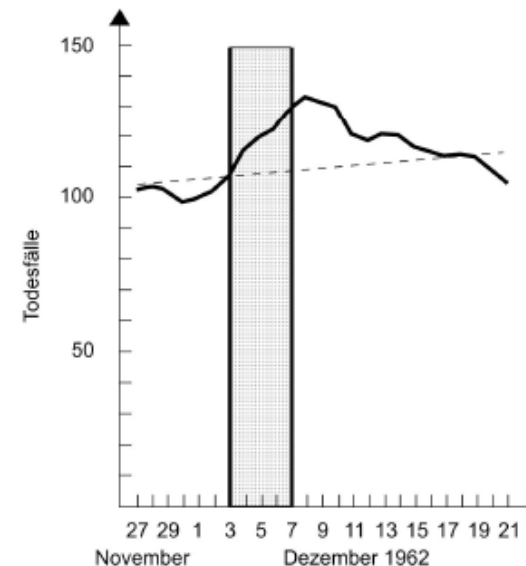


Air Quality in the Ruhr region deplorable

Climax: smog-episode 03.-07.12.1962

- SO_2 , 24 h: 5 mg/m^3
(Bochum, 06.12.)
- TSP, 24 h: $2,4 \text{ mg/m}^3$
(Bochum, 05.12.)
- Rise of mortality by
30 %;
- Further smog episodes
1/79; 1/82; 1/85, 1/87

Death toll in the Ruhr area from
27.11.-21.12.1962 (Brockhaus, 1966)
(running average over 7 days)



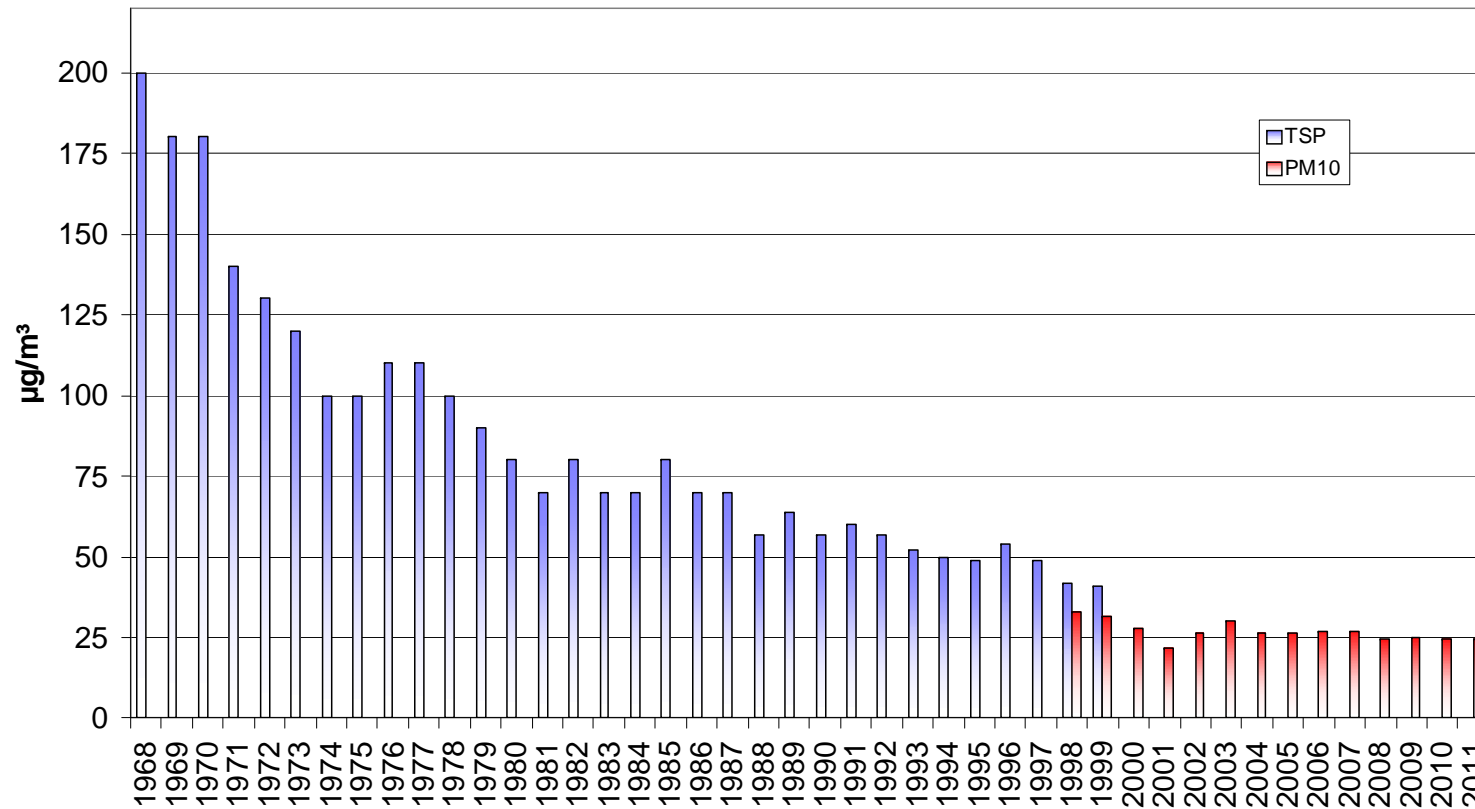
1961
election campaign

Willi Brandt:
Blue skies over the Ruhr district (vision)

Jahresmittelwerte Schwebstaub im Rhein-Ruhr-Gebiet

Annual Means TSP/PM10 - Rhine-Ruhr

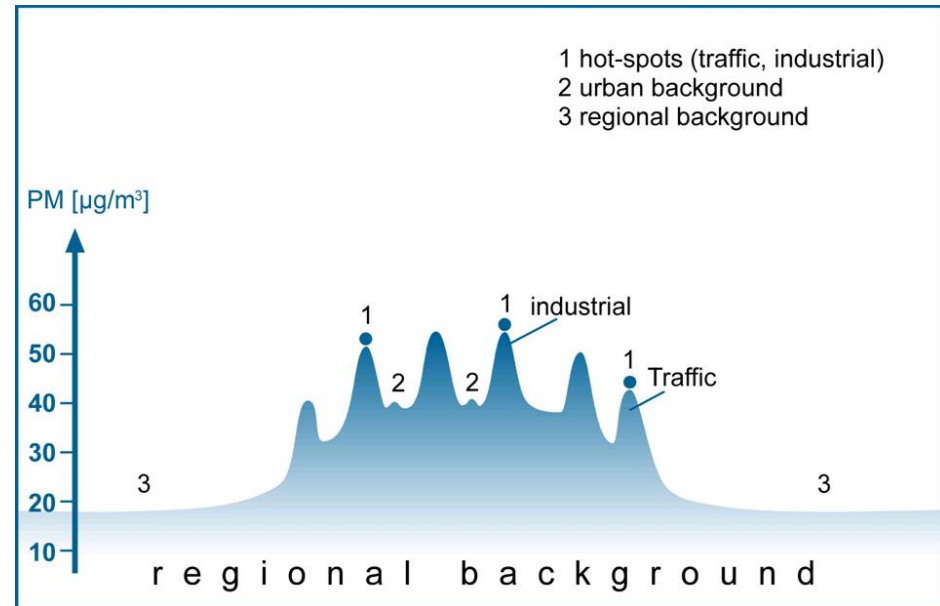
© LANUV NRW, FB43



- Vision of subsequent Chancellor Willi Brandt (1961) realized
- Air quality has improved, but PM levels still far above WHO guidelines

Current design of AQD (1)

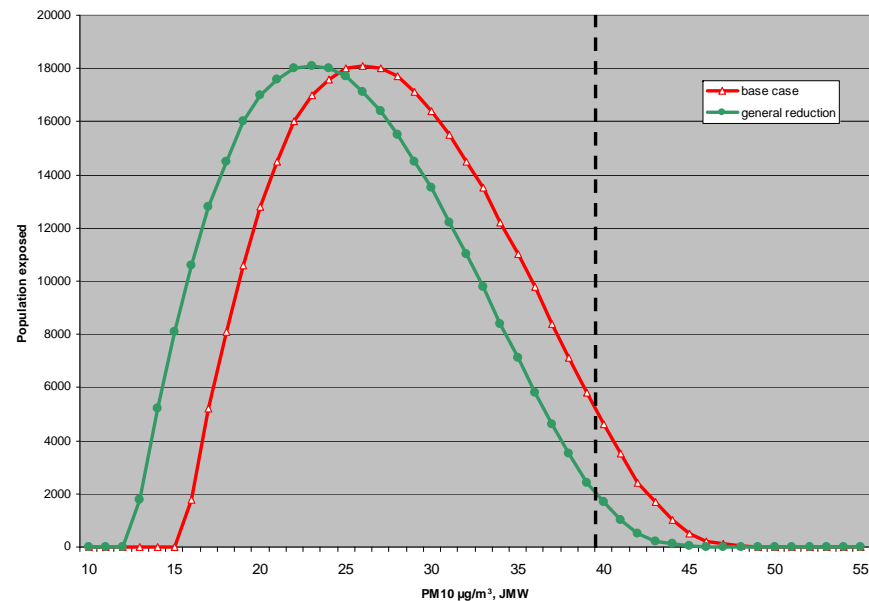
- LV apply everywhere
- LV mass based (PM10, PM2.5)
- Trigger local/regional measures
- Hot-spot driven



Metric	Annual	Daily	Area	WHO (2005)
PM10	40	50 (35)	everywhere	20/50 (1)
PM2.5	25	-	everywhere	10/25 (1)
(2020)	20		everywhere	10/25 (1)
(2015)	20		national av.	

Current design of AQD (2)

- National exposure reduction target for PM_{2.5} (not legally binding)
 - Based on national average at urban background locations
 - National average exposure has to be reduced from 2010 → 2020 by certain percentage



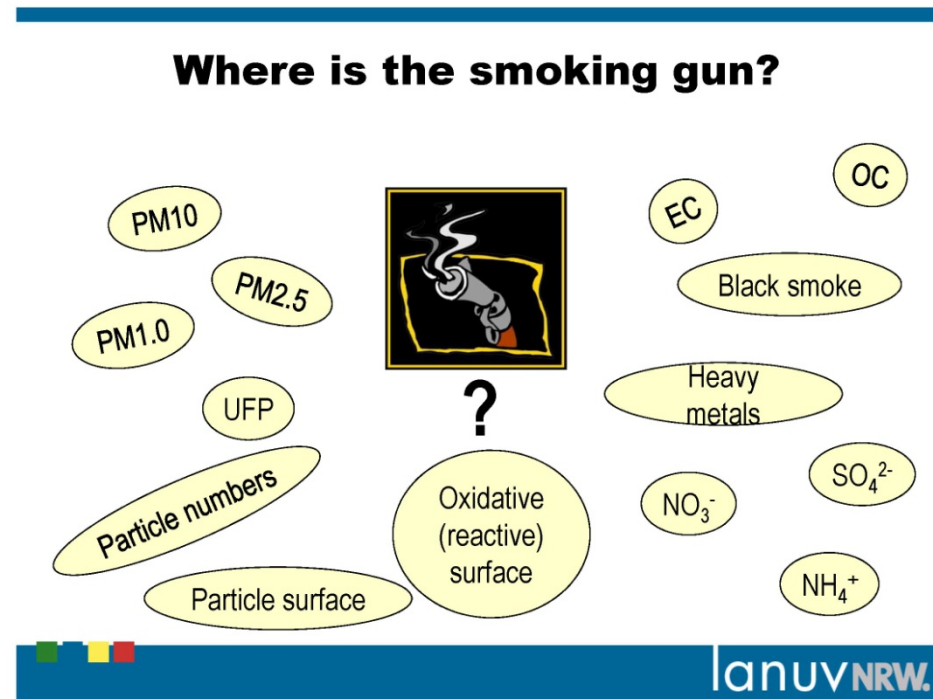
Triggers national reduction plans

Current design of AQD 2008/50/EG, 2004/107/EG

Constituents of PM10			
Compound	Annual mean	Status	WHO (2013) REVIHAAP
Pb	0,5 µg/m ³	LV	↓
Cd	5 ng/m ³	target	deposition?
Ni	20 ng/m ³	target	-
B[a]P	1 ng/m ³	target	-

Questions in respect to future needs

- Mass (PM10, PM2.5) correct metric?
- Further (other) PM constituents? (e.g. EC/TC/BC)
- Simplification of PM „ZOO“ possible?
- Scaling? (hot-spots versus background)
- National exposure reduction legally binding?
- Deposition?

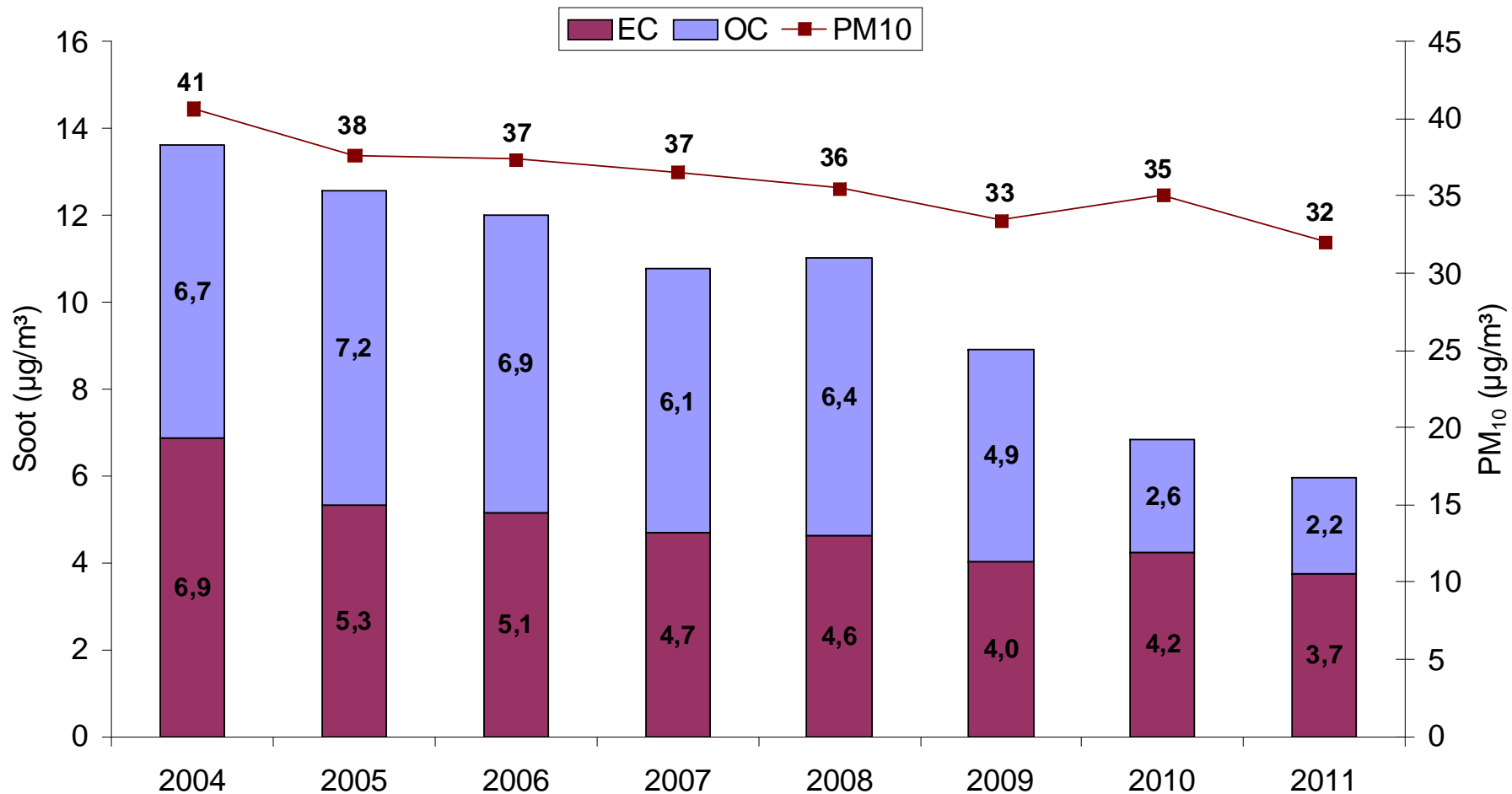


Recommendations of WHO

(REVIHAAP, 2013)

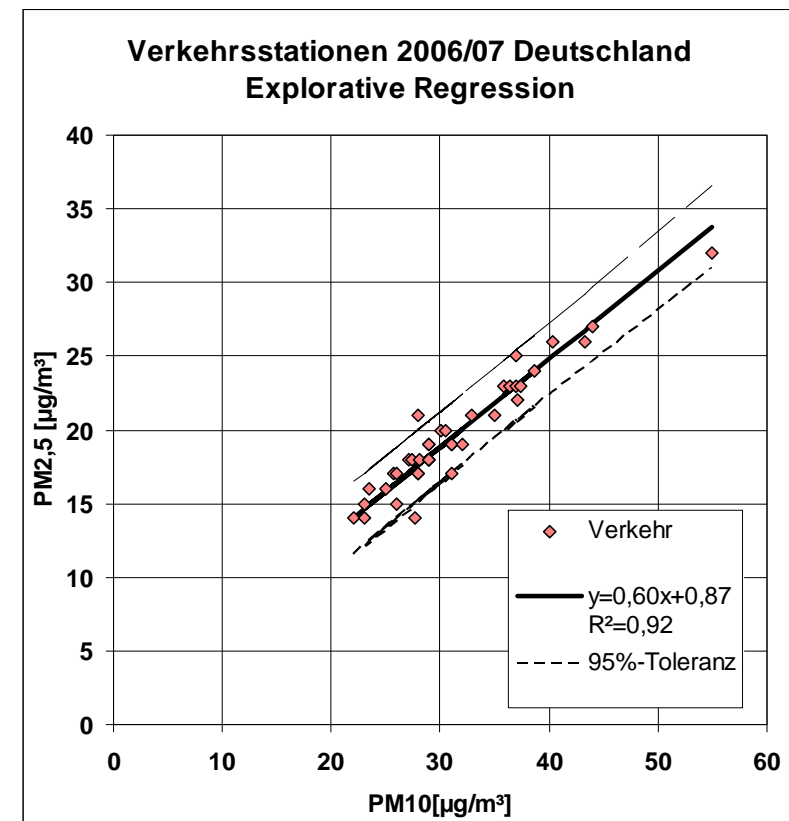
- Keep mass (PM10, PM2.5) as principle metric
- Air quality guideline for EC/BC will be considered *(better indicator for traffic and combustion sources)*
- Short term as well as long term effects:
Keep annual and daily means for PM2.5 and PM10,
lower limit values
- No threshold: make exposure reduction legally binding
- Regulate Cd deposition to agricultural soils

Trend of PM₁₀, EC and OC (annual means) at Düsseldorf, Corneliusstraße



Items to be considered from the perspective of regional authority

- Simplify „ZOO“ of equivalent limit values, avoid redundancies (public awareness)
- Keep daily mean (PM10 or PM2.5) for public information and possible measures during episodes
- Establish „European supersites“ (background, urban, near sources) for monitoring PM mass, EC, UFP ... (base for effect related research)
- Monitor EC/TC as better indicator for traffic related measures
- Regulate deposition of heavy metals into soil (Cd)



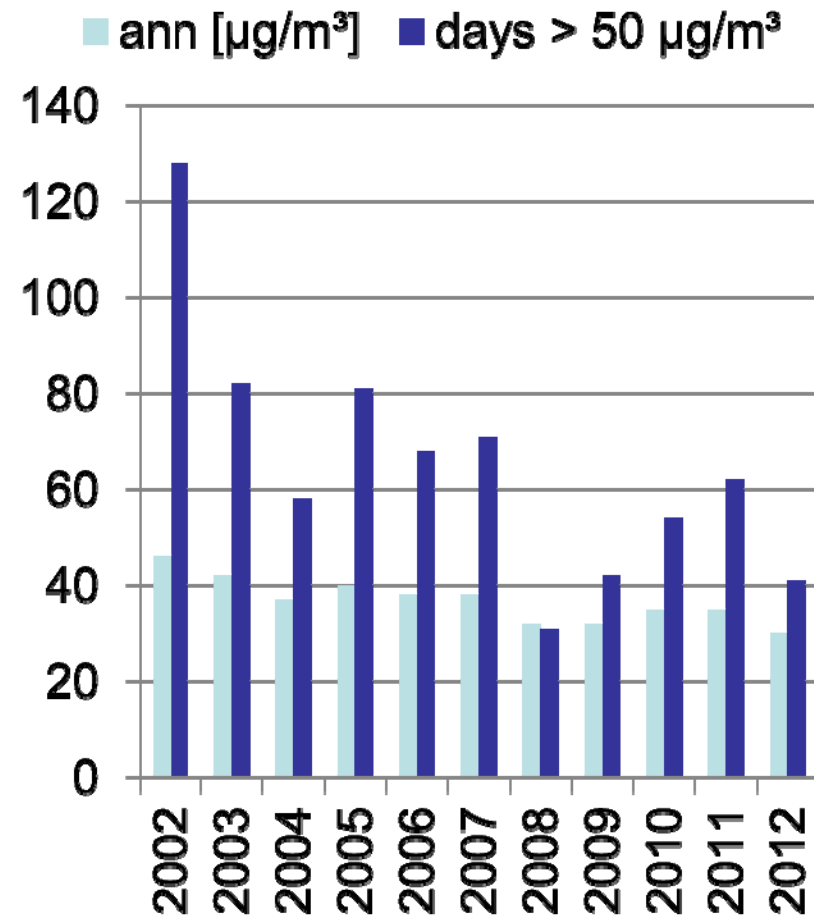
Where do LV apply?

Hot-spots	versus	Urban background (exposure reduction)
Also the highly exposed must be protected (social equity)		Some local measures ineffective (e.g. deviation of traffic)
Measures at hot-spots often also reduce background levels		Reduction of general exposure benefits public health more than “peak value shaving”
Public awareness more focussed on hot-spots (→ political pressure)		LV closer to WHO AQG
Trigger measures on local/regional scale (e.g. LEZ, wood combustion)		Easier to monitor/model
		Trigger national measures

⇒ Keep LV which apply everywhere (with exposure)

⇒ Combine with legally binding exposure reductions

PM10-trend, Duisburg-Bruckhausen (near steel works)



CAFE

Source
related
measures
(e.g. EURO6,
IED Dir.)

NEC
2001/81/EC
(UNECE)
national
reduction
plans

Air Qual. Dir.
2008/50/EC
local/regional
measures, air
qual.
objectives

- Revision NEC Dir.: obligation for PM2.5
- Additional European source related regulations: off-road machinery (incl. Inland water shipping), small combustion units, sea going vessels

To sum up

- Fair balance of coherent European source related, national (NEC, exposure reductions) and local/regional measures (limit values)
- Simplify system of limit values, remove redundancies
- Establish supersites for research on new metrics (overcome hen-egg problem)
- Approach WHO guidelines stepwise as far as feasible
- Regulate deposition of heavy metals (Cd)
- Monitor EC(TC) as better tracer for combustion sources

Thank you for your attention!

