

DPF-Quality in Swiss Construction Sites

Control of Filters in the Field

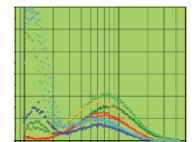
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20th ETH-Conference on «Combustion Generated Nanoparticles»
September 16th, 2016, Zurich



Kanton Zürich
Baudirektion
**Amt für Abfall, Wasser,
Energie und Luft**



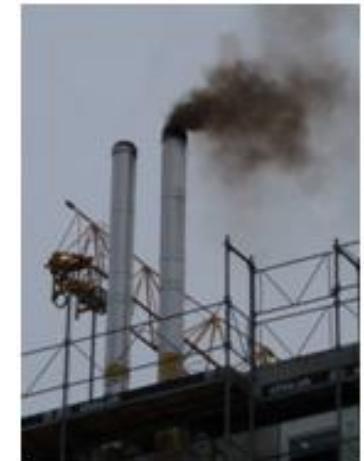
Stadt Zürich
Umwelt- und Gesundheitsschutz

Content

1. Main emissions sources / Construction Sites in Zurich
2. Legislation / History
3. Procedure and Focus of Controls
4. Results of Canton and City of Zurich
5. Experiencies / Information campaign
6. Further steps

Main Emission Sources of PM10

- Industry & Labor
(construction sites)
- Wood-fired Installations
- Traffic (heavy duty vehicles)





Canton of Zurich – City of Zurich



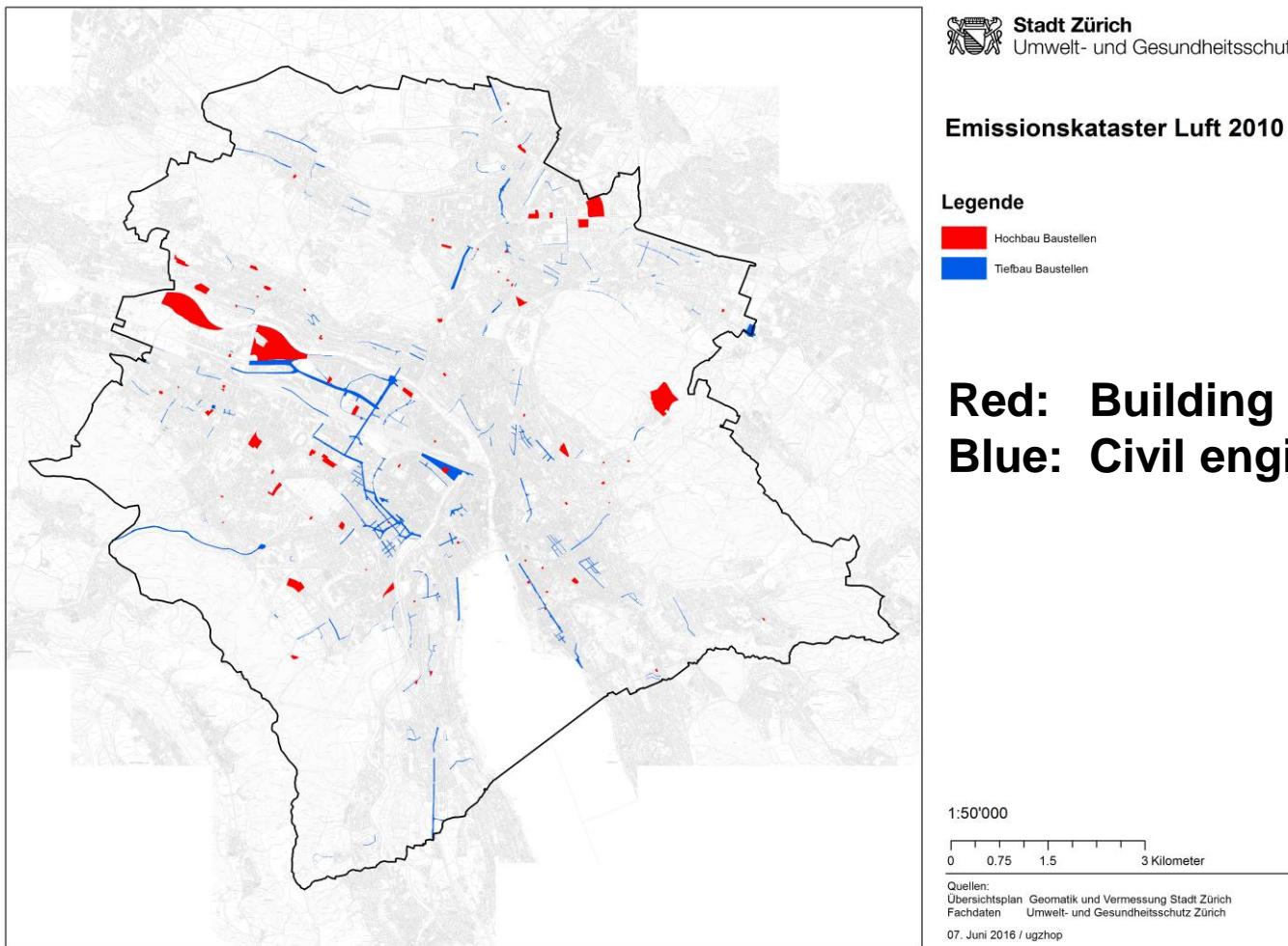
Switzerland,
Canton of Zurich



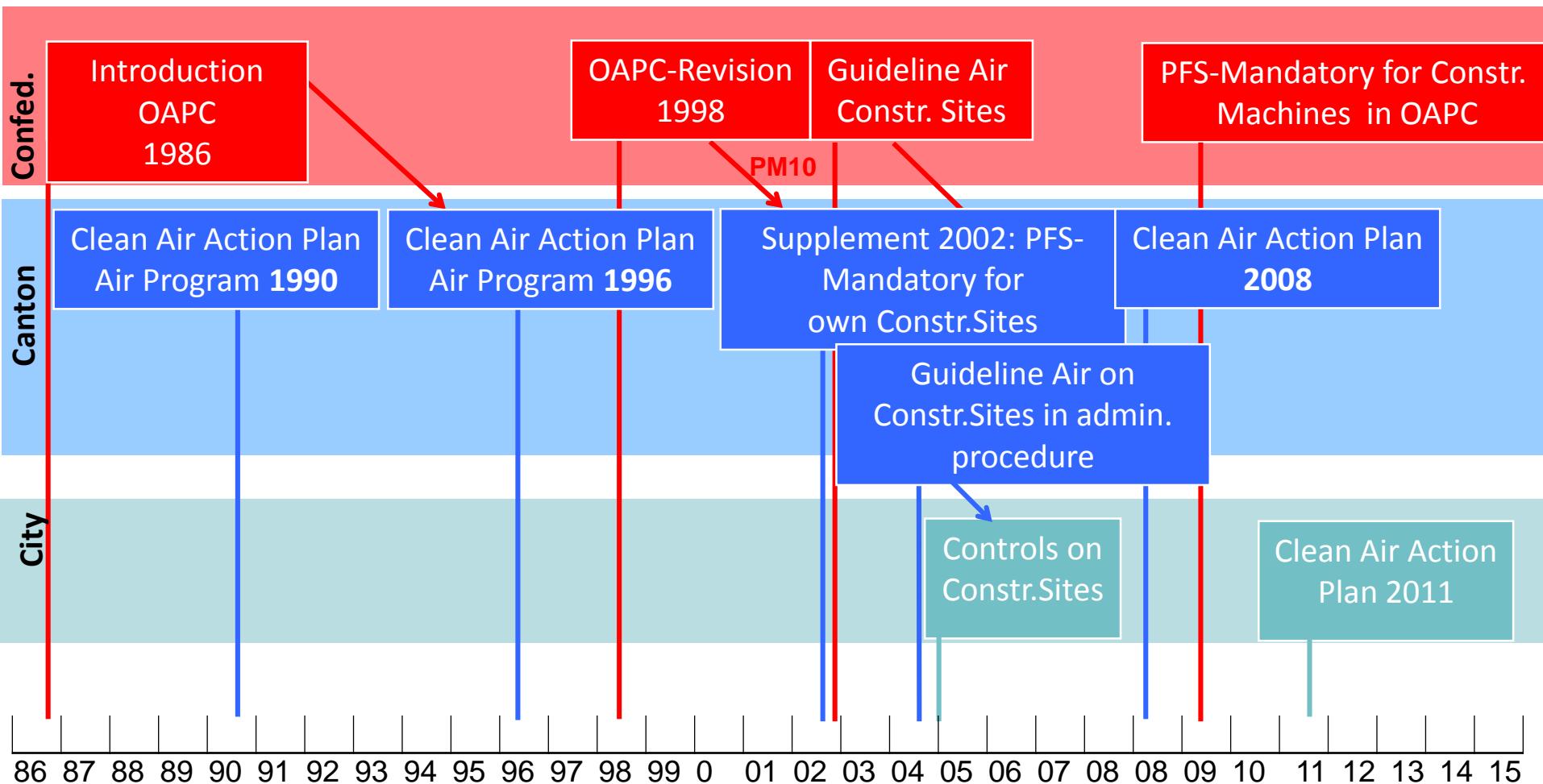
Canton of Zurich,
City of Zurich



Construction Sites – Distribution of High Priority Sites



Legislation: Context



Canton of Zurich – Controls of Construction sites



- Construction sites in the responsibility of municipalities (169)
- cantonal database, few data due to limited resources
- external resources (air / noise / water and soil protection) available for municipalities: (BUC = Construction site Environmental Controlling), frequency of use?
- Canton of Zurich controls construction sites in its own responsibility
- Mainly sites of civil engineering (roads, public transport infrastructure, etc.)
- Financial penalties for non-compliance with the DPF-regulations (2008)
- Communication with construction industry

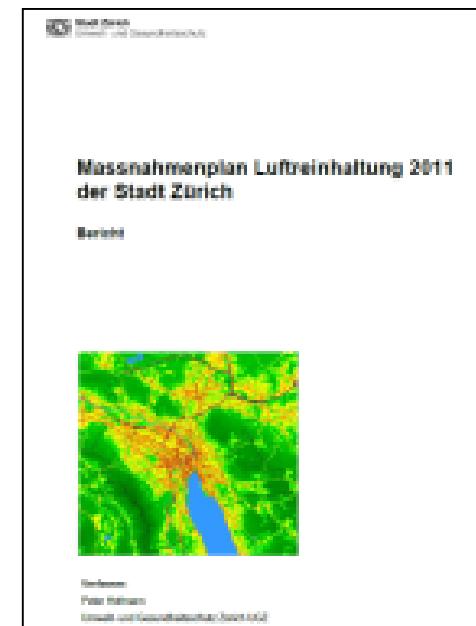




Legislation: Clean Air Action Plan 2011, City of Zurich, Measures in our own Responsibility

City Administration, Diesel engines > 50 hours/year:

- Diesel engines on construction sites of the City
Limit value for particle number $> 18 \text{ kW}$
 $1 \times 10^{12} \text{ 1/kWh}$
- Accepted are registered DPF (FOEN-filter liste)
or equivalent systems with certificate of conformity
as specified in OAPC.
- Same regulation for diesel engines
in agriculture and forestry



Construction Site Inspection – Equipment



Construction Site Inspection – Procedure / 1

Stages before control:

1. Approval contains strict invitation to contact our office (high priority sites)
2. Visit of the responsible person (construction site management) in our office. Information on the construction project have to be provided (machine and engine list, timetable, declarations)
3. Construction permit after fulfillment of these conditions

Construction Site Inspection – Procedure / 2

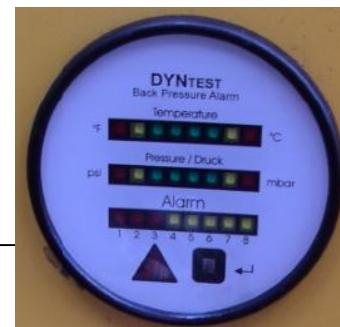
1. Main focus on DPF

- present
- functional (measuring not yet possible)



Visual control:

- blank tail pipe inside?
- handkerchief soot test
- cloud of smoke at start / under free acceleration
- Datalogger filter monitoring



Construction Site Inspection – Procedure / 3

2. Exhaust Maintenance

- Exhaust Sticker
- Exhaust Maintenance Document



Visual control:

- Installation Certification / Identification DPF
- Exhaust Maintenance Document (Engines > 18kW)
- Engine Maintenance: Exhaust Sticker

The Maintenance is to update every 24 months!



Construction Site inspection – Procedure / 4

3. Dust Emissions

Visual control:

- Material displacement
- Material break
- Material processing and treatment



4. After the inspection

- Written report to site management and company (evtl. to customer),
- If necessary: (urgent) measures: perform maintenance, retrofit DPF, dislocation of machine etc.
- Follow-up control (with bill)

Results / Canton of Zurich – Controls in a Company



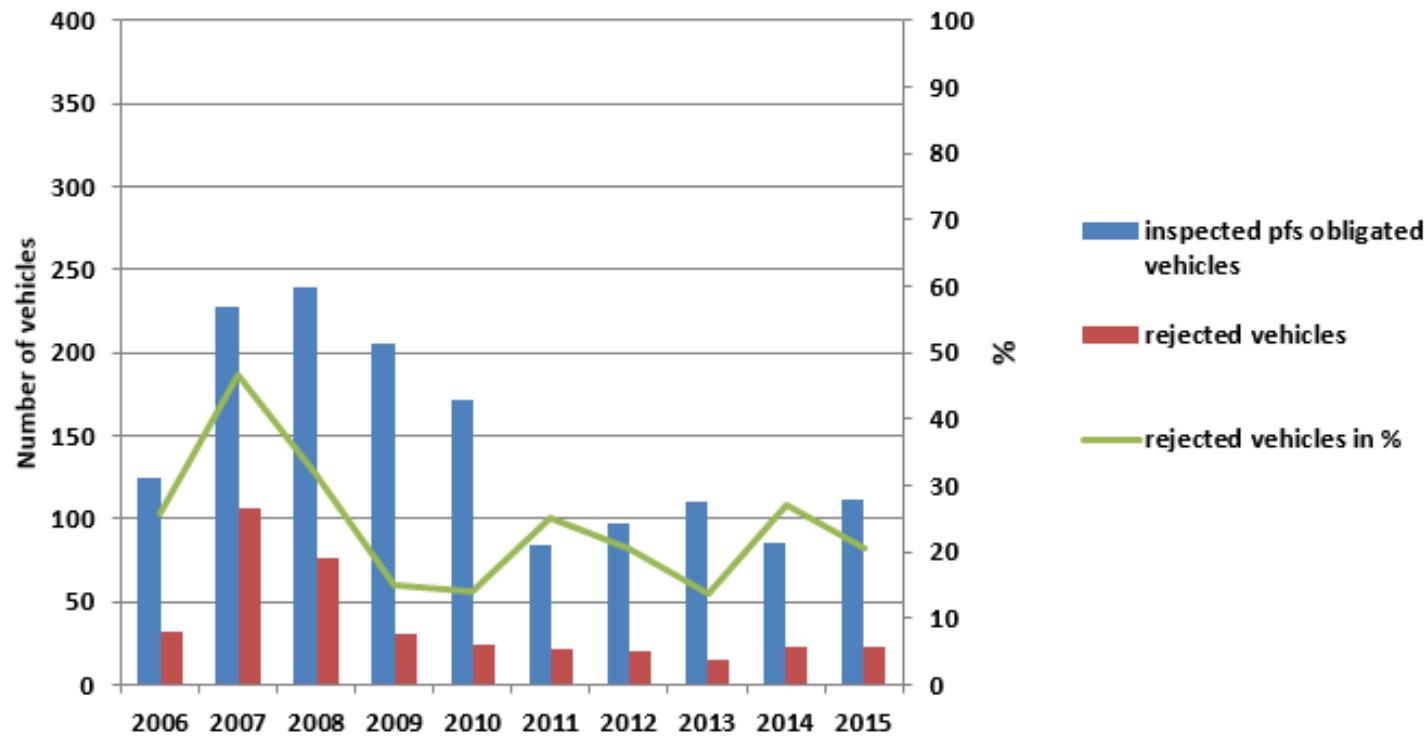
- 23 machines measured
- 4 machines with malfunction in the DPF
- 1 machine without DPF
- 1 machine with emission concentration of 160'000 P/cm³

Results show correspondence to the results of visual inspections in the field





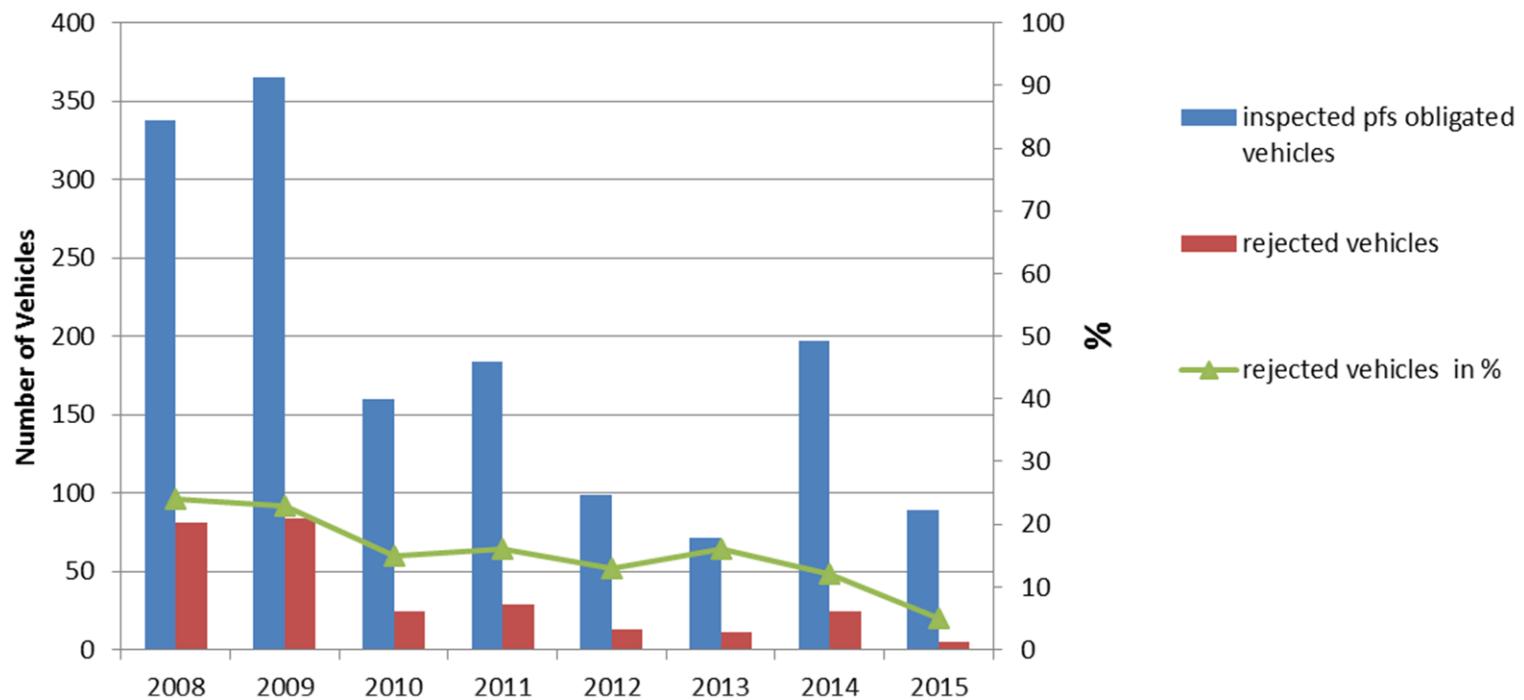
Canton of Zurich – Results of inspections





City of Zurich – Results of Inspections

Construction Site Inspections, City of Zurich 2008 - 2015



Experiencies

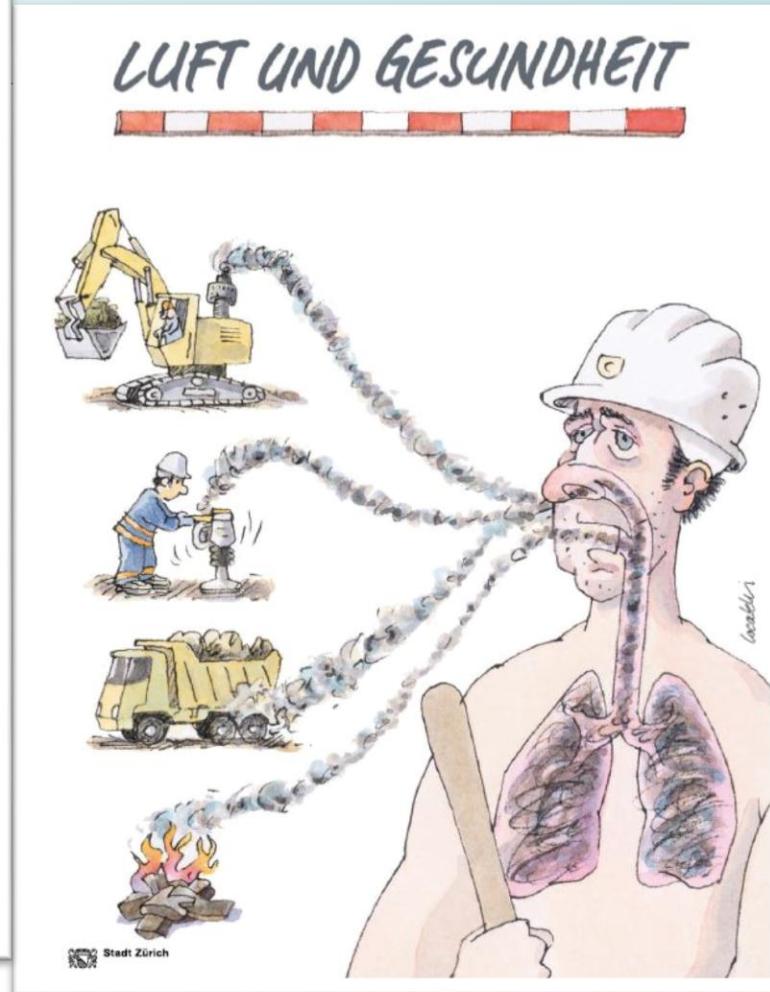
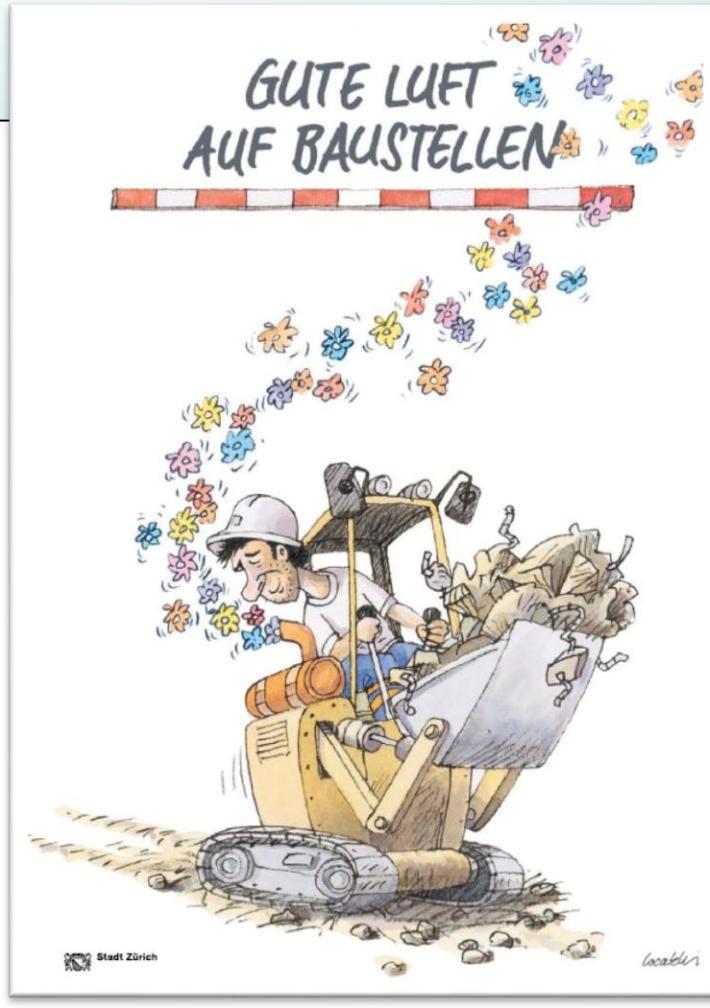


- High Effort in introducing of new measures (for operator/owner and administration)
 - Problem of NO₂ (f.ex. CRT-Systems)
 - Control costly - Enactment still too federally (resources, priorities)
-



- DPF established on our construction sites
- Use of von alcylate fuel has proved its worth

Information Campaign “Znüni-Bus - Good Air on Construction Sites” (2011)



Snack + informations for 20 minutes during break on construction sites

Most important Cause of Complaints: Mineral Dust



Further steps

- Further promotion of DPF – according to our own possibilities
- promote use of electric-powered equipment
- Implementation of particle number measurement

More Informations



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Stadt Zürich
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- www.bafu.admin.ch/luft/
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- www.stadt-zuerich.ch/baustellen-luft

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Thank you for your attention!

