


AMBIENT AIR MONITORING AND EMISSIONS ABATEMENT IN INDUSTRY

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AMBIENT AIR MONITORING AND EMISSIONS ABATEMENT IN INDUSTRY

- Introduction
- Network for automated ambient air measurements in Flanders
- Automatic BTEX measurements in the network
 - What ? How ? Where ?
 - Results
- Zelzate case - Link with emissions
- Conclusions

INTRODUCTION

- ambient air monitoring in Belgium
- 3 regions
- separate institutes for ambient air monitoring
 - Flanders = VMM
 - Brussels = MIVB/IBGE
 - Wallonie = ISSEP
- IRCELINE : collect all data to export to Europe

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Network for automated ambient air measurements in Flanders

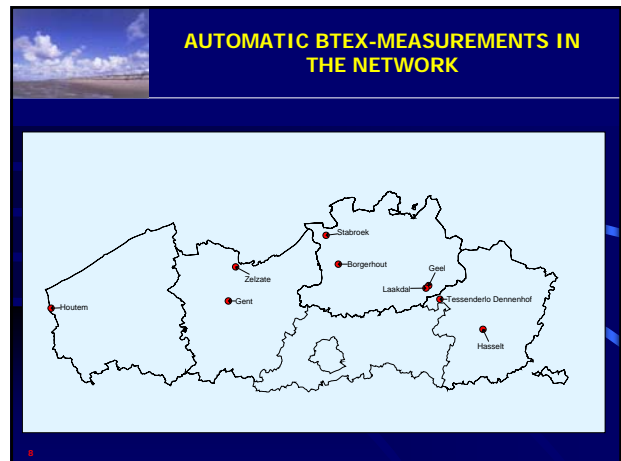
- On line monitoring :
measurement of SO₂, NO_x, O₃, CO, PM10 en PM2.5 dust, BTEX + meteo
- Field sampling + lab analysis :
 - heavy metals, fluorides
 - Acidification (deposition)
 - Dioxins and pesticides (deposition)
 - organic compounds in ambient air : VOC, PAH, Nitro-PAH

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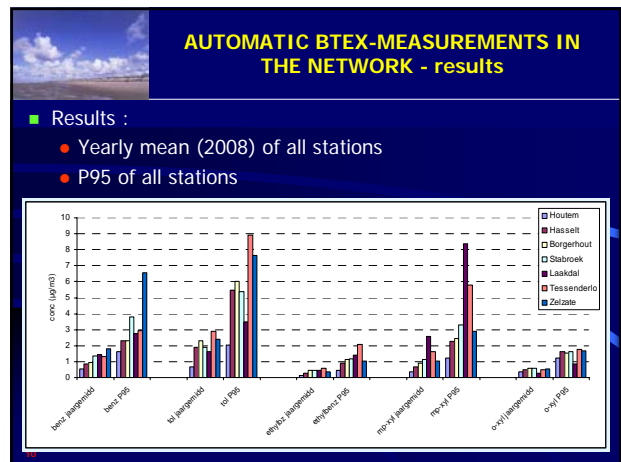
AUTOMATIC BTEX-MEASUREMENTS IN THE NETWORK

- What ?
BTEX
= Benzene, Toluene, Ethylbenzene, m+p-Xylene, o-Xylene
- Where ?
9 stations of different types
 - **urban** : Borgerhout
 - **rural** : Houtem
 - close to **industrial** sites : Tessenderlo, Zelzate



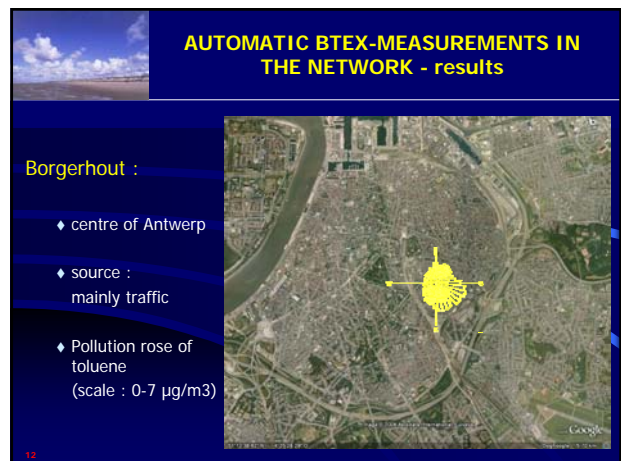
AUTOMATIC BTEX-MEASUREMENTS IN THE NETWORK

- How ?
 - Automatic BTEX-monitor
 - ◆ rack model
 - ◆ automatic GC (FID or PID)
 - ◆ 15 or 30 min mean
 - ◆ 24 hours / day
 - Placed in air conditioned shelters



AUTOMATIC BTEX-MEASUREMENTS IN THE NETWORK - results


- Results :
 - pollution roses :
 - ◆ links concentrations and wind direction & speed
 - ◆ indicates possible BTEX-source(s) with pollution origin
 - 4 examples :
 - ◆ Borgerhout (urban)
 - ◆ Houtem (rural =background)
 - ◆ Hasselt (urban background)
 - ◆ Zelzate (industrial)



AUTOMATIC BTEX-MEASUREMENTS IN THE NETWORK - results

Houtem :

- ◆ Background station
- ◆ Low concentrations
- ◆ Pollution rose of benzene (scale : 0-2 $\mu\text{g}/\text{m}^3$)

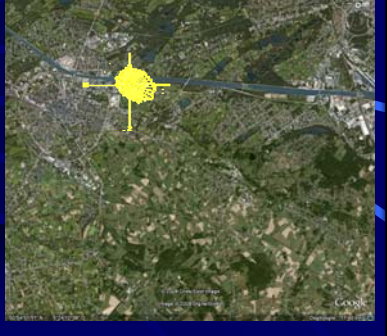


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AUTOMATIC BTEX-MEASUREMENTS IN THE NETWORK - results

Hasselt :

- ◆ City background station influenced by industry
- ◆ Benzene : no specific source (scale : 0-3 $\mu\text{g}/\text{m}^3$)
- ◆ Toluene : mainly industry

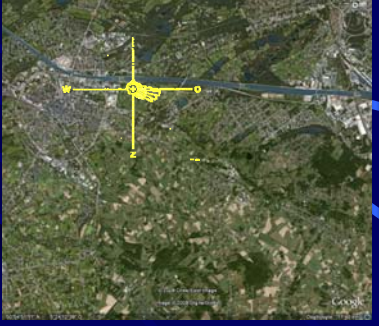


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AUTOMATIC BTEX-MEASUREMENTS IN THE NETWORK - results

Hasselt :

- ◆ City background station influenced by industry
- ◆ Benzene : no specific source
- ◆ Toluene : mainly industry (scale : 0-20 $\mu\text{g}/\text{m}^3$)




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AUTOMATIC BTEX-MEASUREMENTS IN THE NETWORK - results

Zelzate :

- ◆ Industry linked
- ◆ Source : mainly industry
- ◆ Pollution rose of benzene (scale 0-20 $\mu\text{g}/\text{m}^3$)



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The ZELZATE case

- History of VMM measurements in Zelzate :
 - 1995 : start BTEX measurements by VMM results published on yearly basis
 - 1996 : guidance commission
 - ◆ Formed by Flemish environment administration
 - ◆ Control of licence criteria of Rütgers
 - ◆ BTEX results transferred to Rütgers on monthly basis
 - 2001 : benzene 30 min mean on line on internet afterwards, established direct connection between VMM BTEX monitor and PC Rütgers nv.

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The ZELZATE case

- Measuring station Zelzate :
city center (backyard of city hall)
- Industry close to station : Rütgers nv. – 3 divisions :
 - Refining coal tar (cokes)
 - Production of phthalic acid anhydride using naphthalene
 - Distillation of benzol (cokes) in pure fractions of benzene, toluene and xylene

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The ZELZATE case

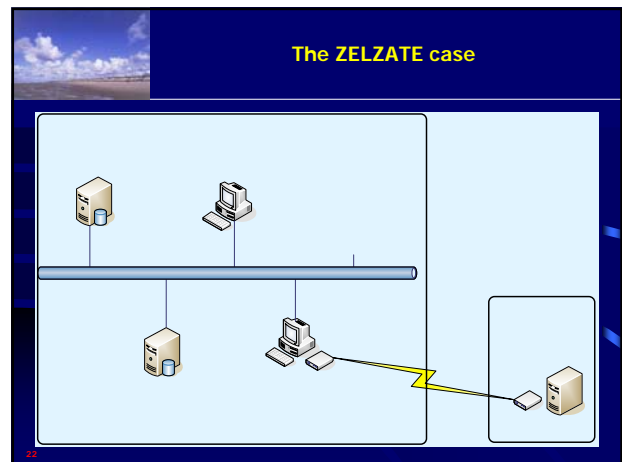
- Possible sources of emission :
 - Waste gases from production processes
 - leaks in equipment (eg. pumps)
 - storage and transfer of end products (benzol => benzene and toluene release)
- Emission reduction measures:
 - Waste gas treatment : washing + thermal oxidation - afterburning
 - Using leak free pumps and other equipment
 - Storage and transfer in closed systems with vapour recuperation

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The ZELZATE case

- Control system of Rütgers nv :
Use of VMM BTEX concentrations + Rütgers wind direction & speed
 - X-air (=VMM DB) data available immediately after acquisition
 - modem connection between 'master' PC and measuring station via X-air, every 30 minutes : export of data to the software application (on Rütgers master PC)
 - SQL-server for data storage and retrieval

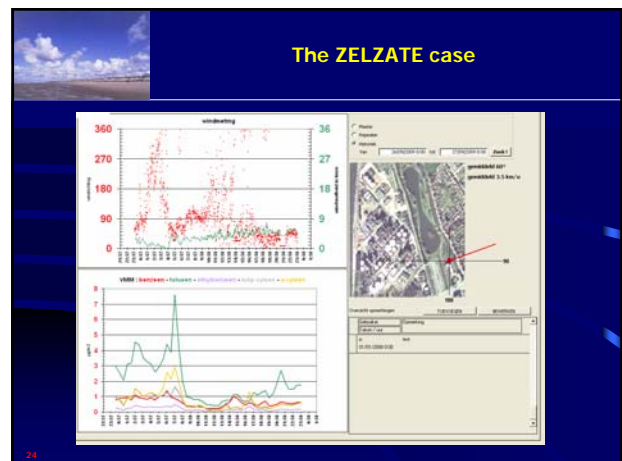
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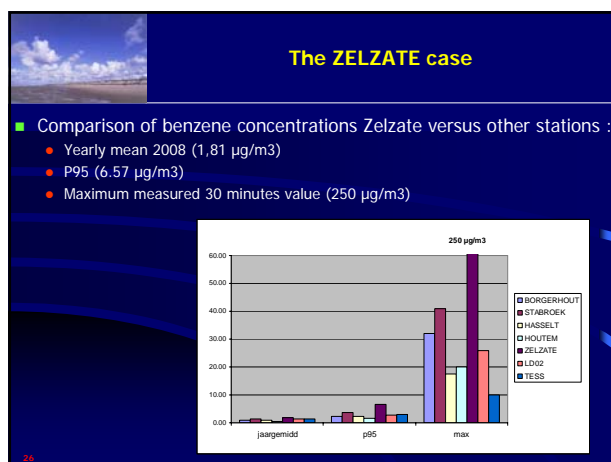
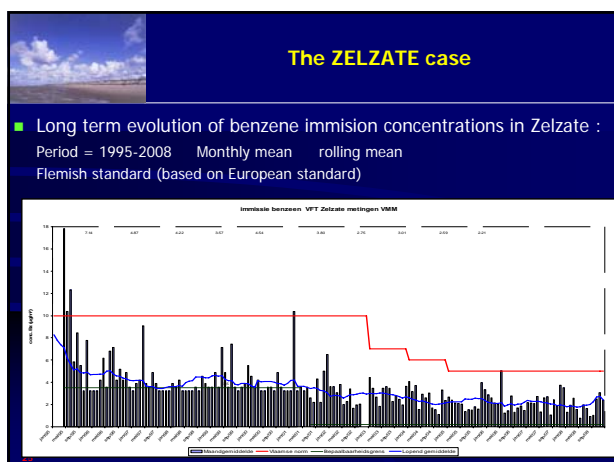


The ZELZATE case

- Control system of Rütgers nv :
 - software application for data collection on master pc :
 - ◆ 1 sample/min = 'real-time' visualization (= repeater mode)
 - ◆ 1 refresh/min or browsing/visualization of historical data (= history mode)
 - repeater and history mode can be run on any pc connected to the internal network

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CONCLUSIONS

- On line BTEX measurements :
 - Tool to locate and identify possible pollution sources (pollution roses)
 - Immission concentrations give an assessment of the importance of the emissions
- Cooperation between government and industry :
 - Exchange of information
 - Fast action possible
 - Emission abatement

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Thank you for your attention !

Websites :
www.vmm.be
www.ircline.be

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Questions ?

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