



NL Agency
*Ministry of Economic Affairs,
Agriculture and Innovation*

Mercury emissions from Coal Fired Power Plants

Possible impact of an emission limit
value on current emissions of
mercury

WGSR, April 12 2011, Geneva

18 april 2011

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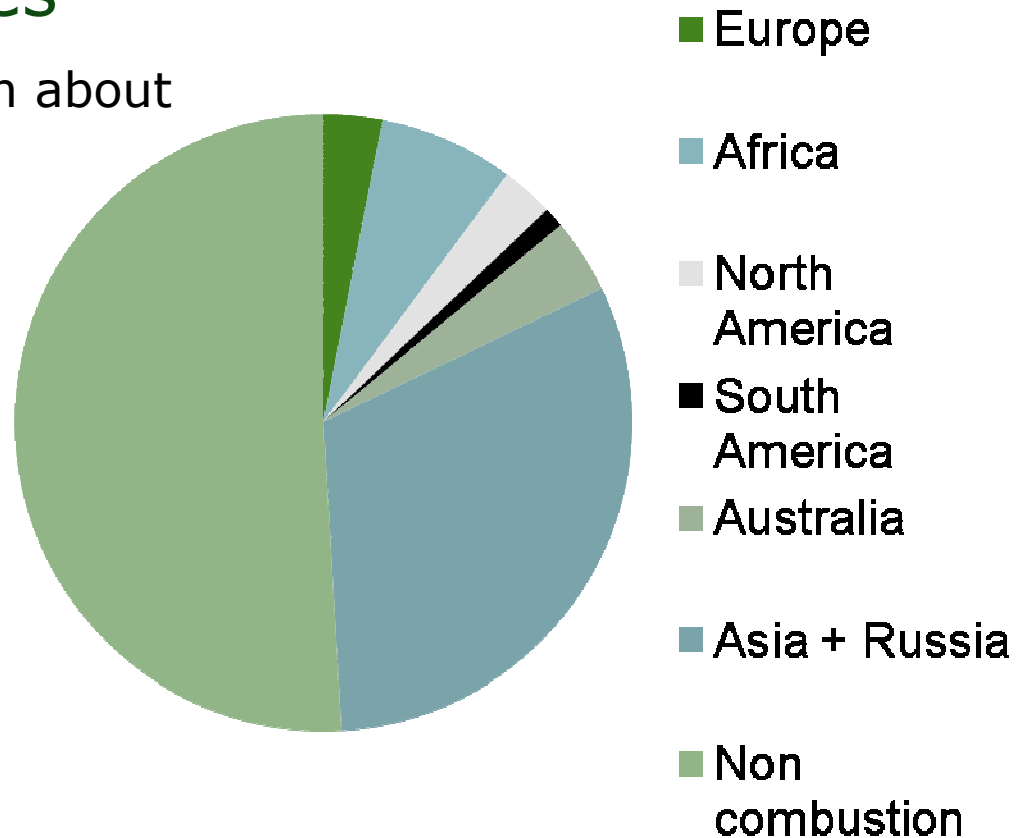
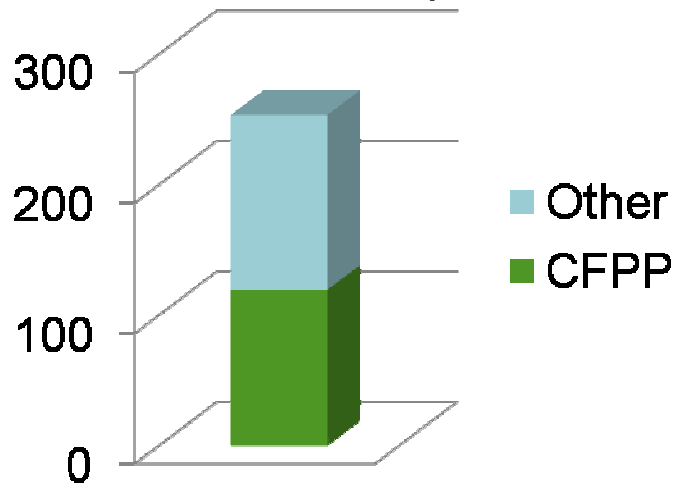
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Global emissions of mercury from anthropogenic sources

2900 tonnes Hg/a, combustion about half of total mercury emissions

Situation in Europe/Eurasia





Multi pollutant or specific mercury control

Multi pollutant mercury control by:

- SCR (NO_x)
- ESP (dust)
- FGD (SO_2)

Overall efficiency 90%

Specific mercury control by
activated carbon

Overall efficiency more than 80%



Reported Hg emissions from current CFPP

	Raw gas	ESP	ESP + FGD	SCR + ESP +	AC + FF
	($\mu\text{g}/\text{Nm}^3$)	($\mu\text{g}/\text{Nm}^3$)	($\mu\text{g}/\text{Nm}^3$)	($\mu\text{g}/\text{Nm}^3$)	($\mu\text{g}/\text{Nm}^3$)
Info source					
BREF LCP		5 (0.3 – 35)	< 5		
Wang	3 -27	3 - 25	2 - 7	1.2	9
DOE/NETL	5 – 20				



Current level of BAT

Multipollutant approach, SCR + ESP + FGD:
ELV of $3 \mu\text{g}/\text{Nm}^3$ is possible

Application for permit new E-On powerplant in Rotterdam:
Mercury concentration below $< 2.4 \mu\text{g}/\text{Nm}^3$
In operation 2012



Proposed ELV for Hg in Heavy Metals Protocol

Proposal for revision of the Heavy Metals Protocol: $30 \mu\text{g}/\text{Nm}^3$

No additional measures needed to meet proposed ELV of $30 \mu\text{g}/\text{Nm}^3$ = » no incentive for emission reduction

US-EPA proposed rule for toxic emissions: 0.003 to $3 \mu\text{g}/\text{Nm}^3$
(0.000010 to $0.2 \text{ lb}/\text{GWh}$)



Multi pollutant approach

Proposal for revision of the Gothenburg Protocol:

- NO_x abatement based on SCR, ELV2 = 150/200 mg/Nm³
- SO₂ abatement based on FGD, ELV2 = 150/200 mg/Nm³

SCR and FGD will reduce mercury emissions by 90%

After compliance with ELVs for SO₂ and NO_x in Gothenburg Protocol emissions will be in the range of 3 µg/Nm³



Costs of abatement

Costs of ELV in Heavy Metals protocol after review of the Gothenburg Protocol

No additional costs for reduction to $3 \mu\text{g}/\text{Nm}^3$ based on multi pollutant approach for SO_2 and NO_x

Additional costs for specific abatement of Hg with AC injection:
6 – 30 m Euro per installation (about 0.0001 euro/kWh)



Conclusion

Proposed ELV of $30 \mu\text{g}/\text{Nm}^3$ for mercury emissions will not encourage abatement of Hg emissions

Assessment of BAT can be based on multi pollutant approach

Costs of mercury abatement based on multi pollutant approach are low

ELV of $3 \mu\text{g}/\text{Nm}^3$ is in line with BAT