



PBL Netherlands Environmental
Assessment Agency

Feasibility and costs of proposed emission ceilings in the Netherlands

National analysis based on
national data

18 May 2011 | Winand Smeets



National Baseline 2020

- **2009:** pre-crisis national BL submitted to IIASA
This BL was used for the CIAM-report march 2011
 - high GDP-growth (2.9% /2005-2020)
 - Renewable Energy Target 2020 only partly achieved (for 35%)

- **2010:** new post-crisis BL was developed
 - intermediate GDP-growth (1.6% /2005-2020)
 - RET is fully achieved (plus EU GHG-targets)
 - latest data from Dutch Emission Inventory are included

- **2010:** Dutch Technical Control Options Database was updated

- Results are based on the new National BL and updated Control Options Database

New Post-Crisis BL compared to Pre-Crisis BL

	Pre crisis NL-BL 2020 kton	Post crisis NL-BL 2020 kton	Difference kton	Reason change in emissions
SO₂	49	41	-8	Crisis, RET, EI
NO_x	207	179	-28	Crisis, RET, EI
NH₃	131	119	-12	EI (agric.)
VOC	162	154	-8	EI, crisis
PM_{2.5}	16.6	12.6	-4	EI (agric.)

RET = full achievement of Renewable Energy Target

EI = latest data from Emission Inventory included



National-BL vs. Primes/Gains-BL 2020

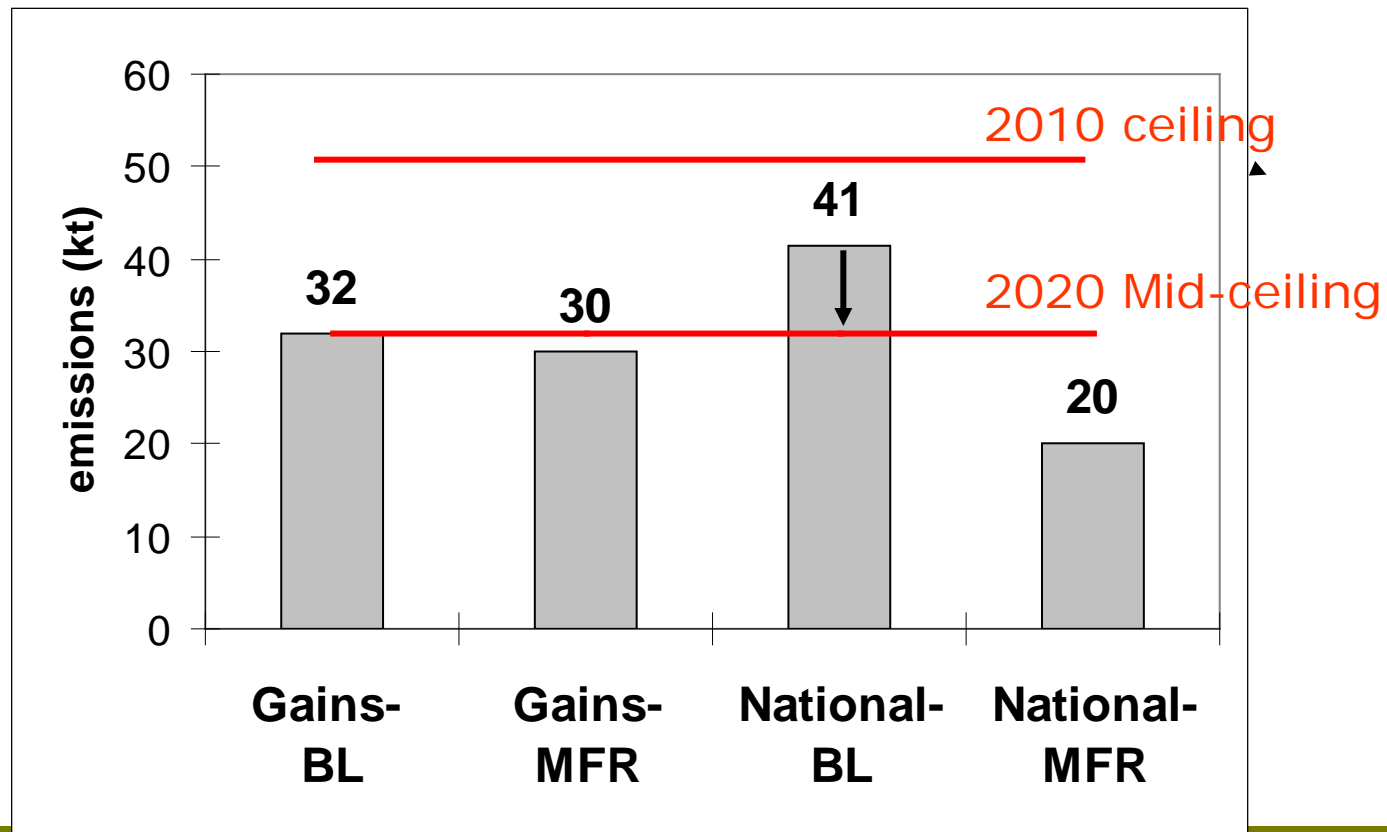
	Primes/Gains BL 2020 Kt	National BL 2020 kt	Difference kt	Difference %
SO₂	32	41	+9	+ 28%
NO_x	169	179	+10	+6%
NH₃	125	119	-6	-5%
VOC	156	154	-2	-1%
PM_{2.5}	15.7	12.6	-3	-19%



Explanation of higher emission projections for SO₂/NO_x in Dutch BL

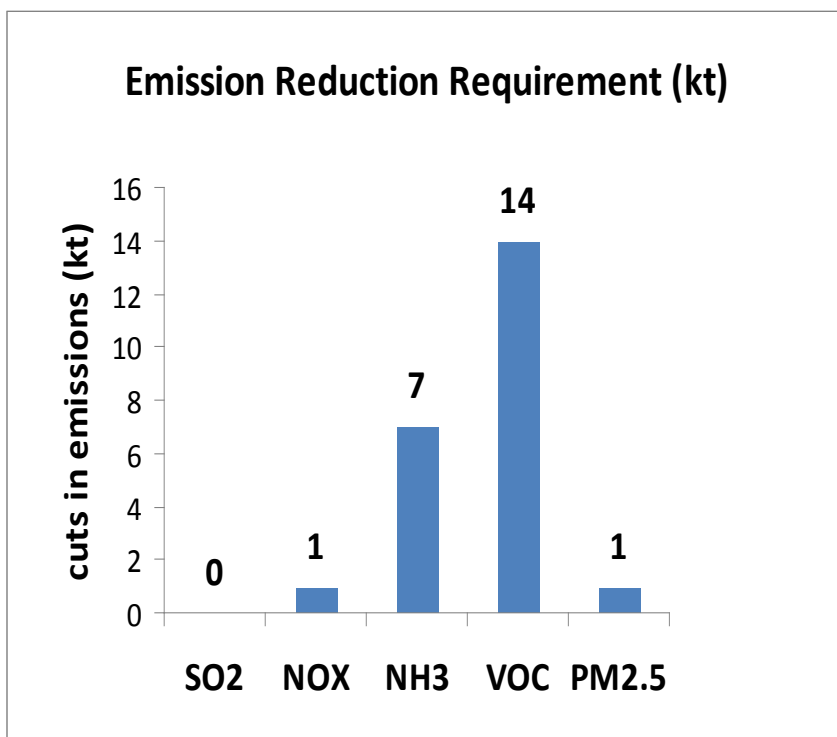
- SO₂
 - CIAM-report underestimates emissions for:
 - › *base metal* (1.7 vs. 7.6 kt NL-BL) explained by
 - lower projected production in the ferrous and non-ferrous metal industry (factor 3) and
 - lower projected e.f. in the non-ferro (factor 4).
 - › *refineries* (11 vs. 15 kt NL-BL) explained by lower projected e.f. (factor 1.8)
- NO_x
 - CIAM-report underestimates emissions for:
 - › *base metal* (due to lower projected production metal industry)
 - › *refineries* (due to stricter projected e.f.)
 - › *transport* (due to different activity levels and e.f.)

Mid Ceilings - Emission Reduction Requirements based on Gains-BL and National BL **SO₂**

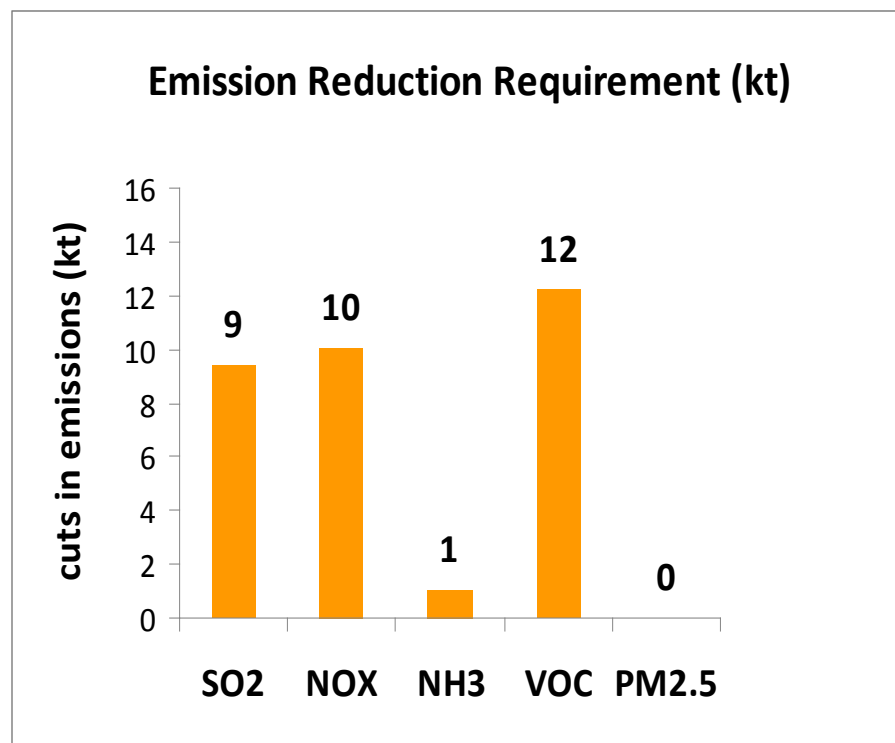


Mid Ceilings - Emission Reduction Requirements

Based on Primes/Gains-BL

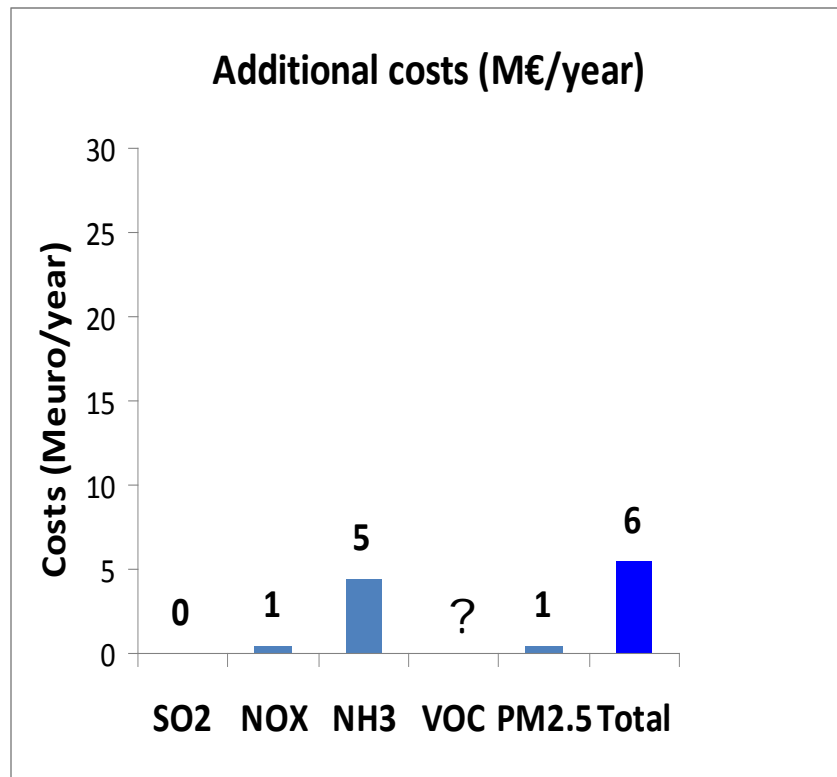


Based on National-BL

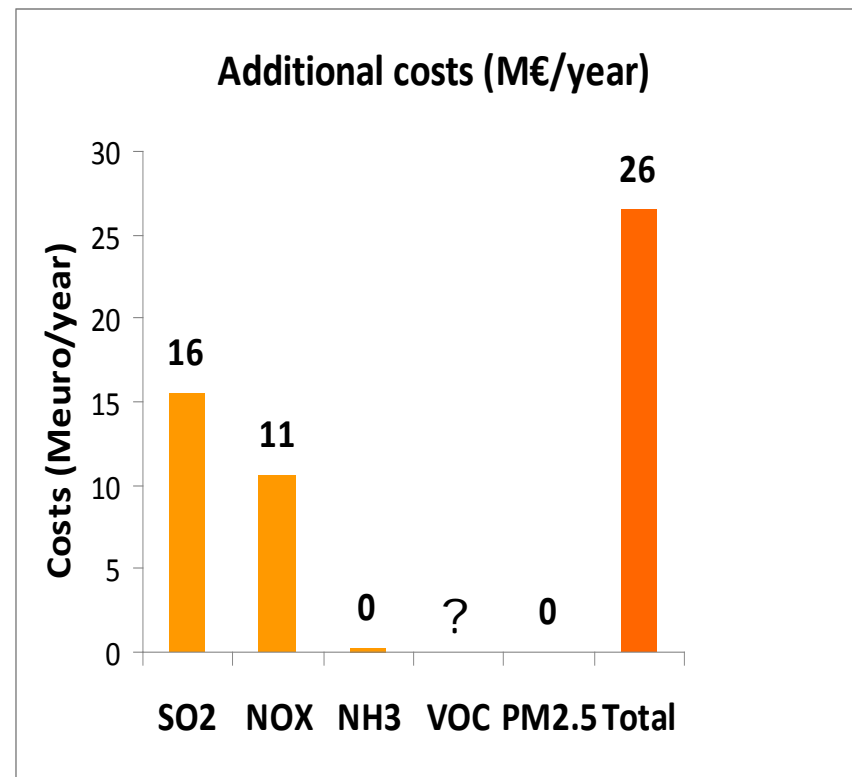


Mid Ceilings – Additional costs excl. VOC (M€/year)

Based on
Primes/Gains-BL

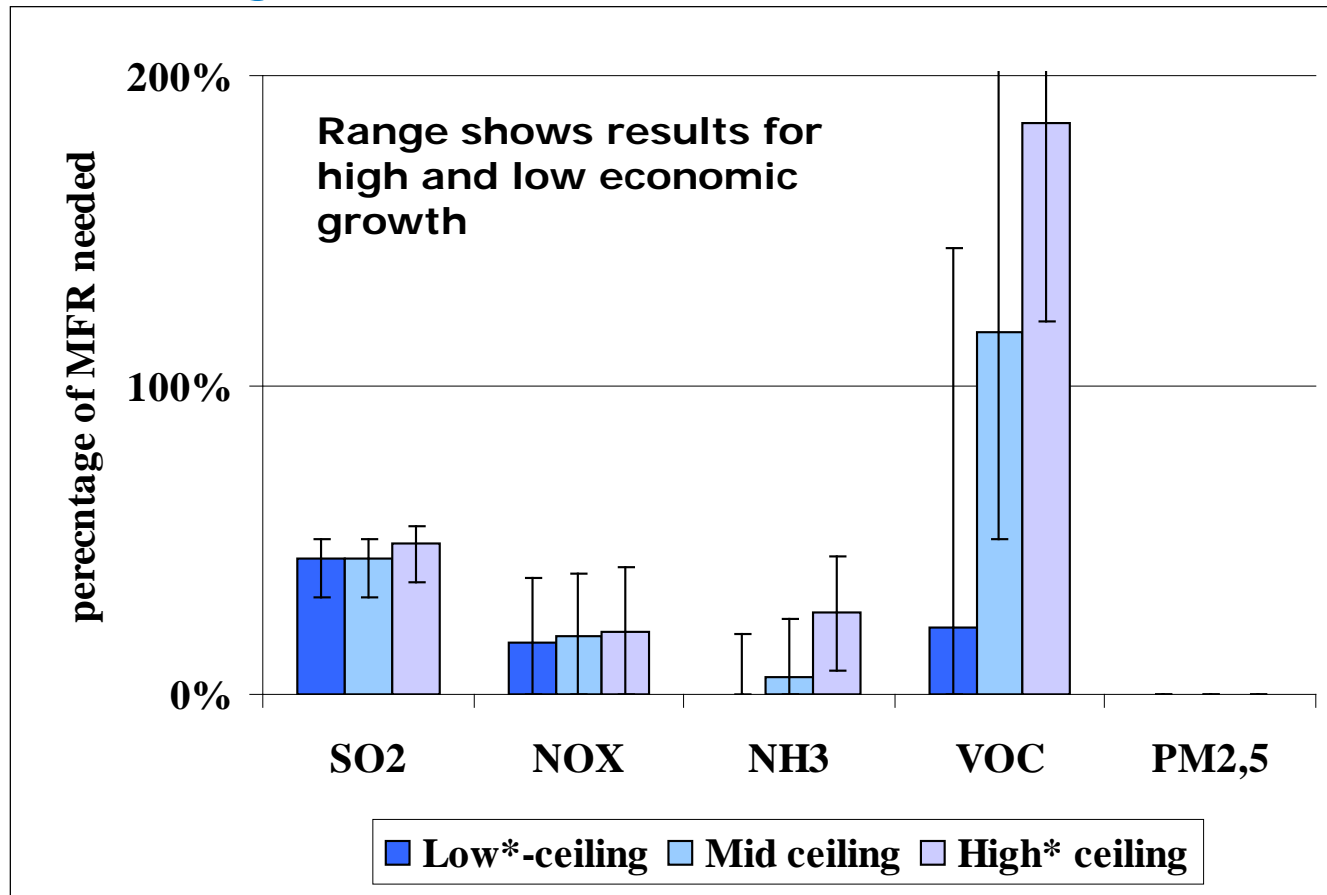


Based on
National-BL



Technical feasibility based on the National BL

Percentage of MFR needed to achieve L*/M/H*-ceilings



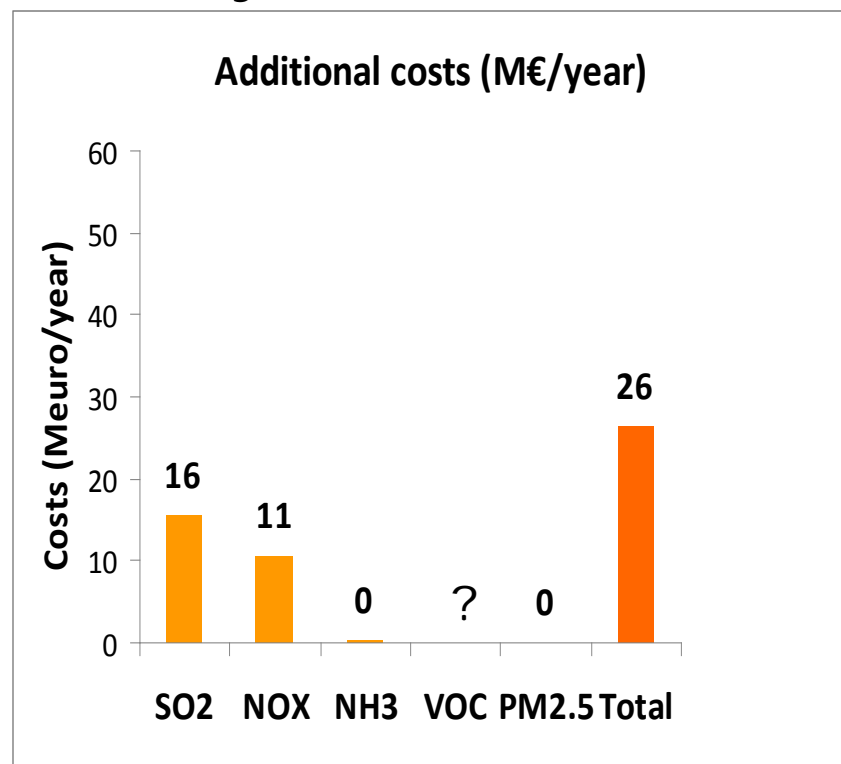


Sensitivity analysis co-benefits Renewable Energy Target

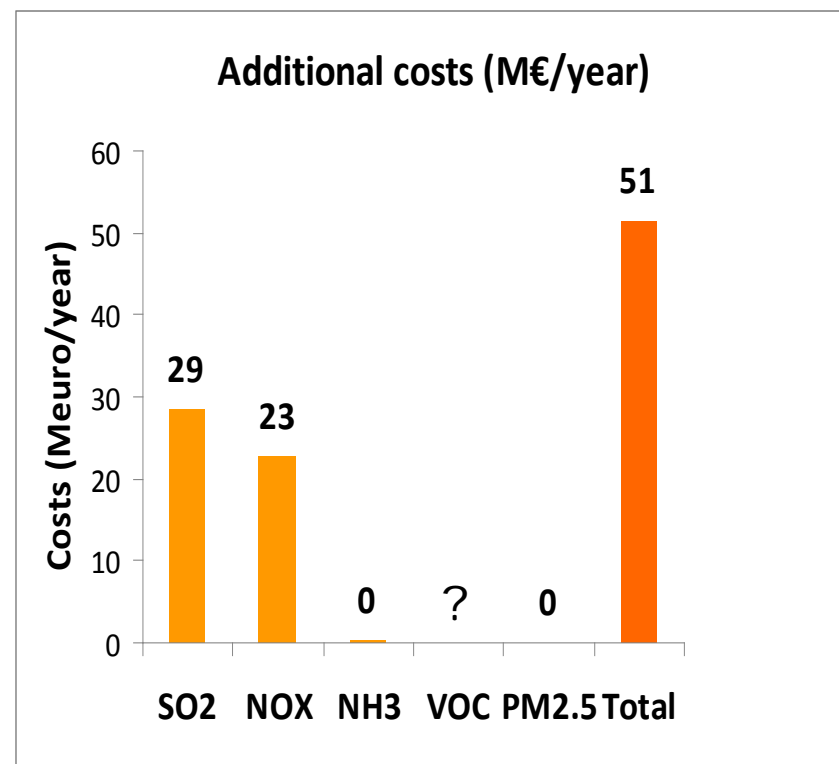
- The Dutch BL assumes that the RET will fully be achieved with only domestic measures (more wind, more biomass) leading to the replacement of coal and natural gas, and thus lower SO₂/NO_x-emissions
- However, part of the RET may be achieved by importing renewable energy from abroad, resulting in less co-benefits and thus higher emissions in the Netherlands
- If half of the RET would be achieved abroad emissions for SO₂/NO_x will increase with 5 kt each
- Costs for SO₂/NO_x (for MID-ceilings) would double from 25 to 50 M€/year

Mid Ceilings – Additional air pollution costs (M€/year)

National-BL
(RET fully achieved in 2020)



National-BL
(RET for 50% achieved in 2020)





Conclusions based on the national baseline

- Proposed Mid-ceilings appear to be technically feasible, **except for VOC**.

The mid-VOC-ceiling seems to be technically infeasible considering the control options in the National database.

- Based on the national baseline, **much more national measures for SO₂/NO_x** will be needed than assumed by the CIAM-report, which will lead to higher costs, and could lead to a loss in competitiveness.
- If half of the Renewable Energy Target would be achieved with imports of renewable energy, ceilings for SO₂/NO_x will still be technical feasible, but **costs** to achieve these two ceilings will **double**.

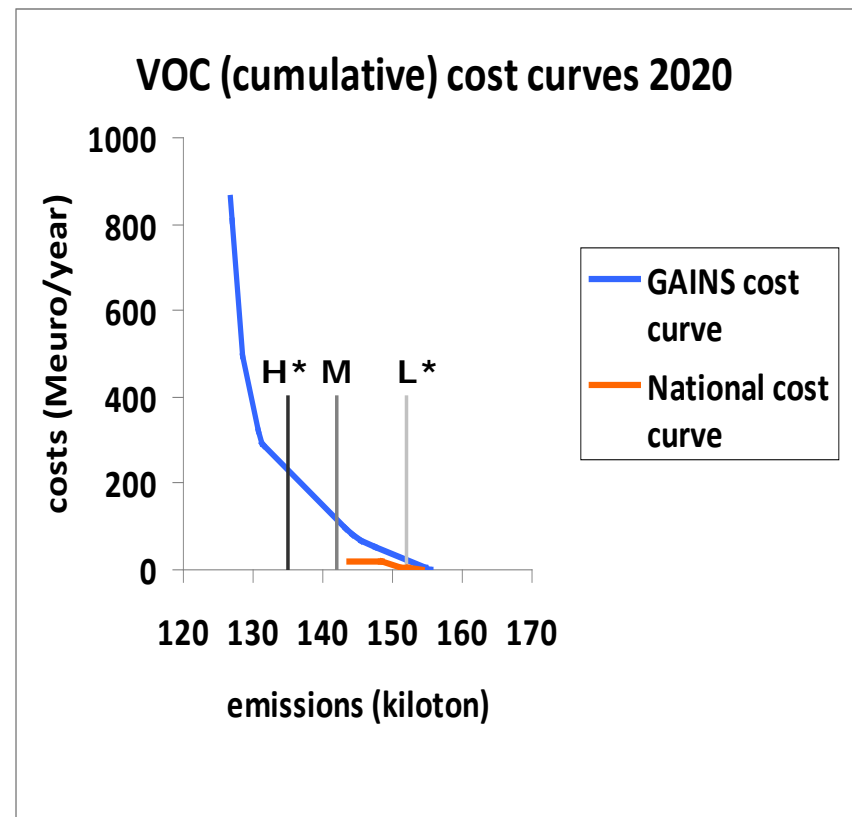


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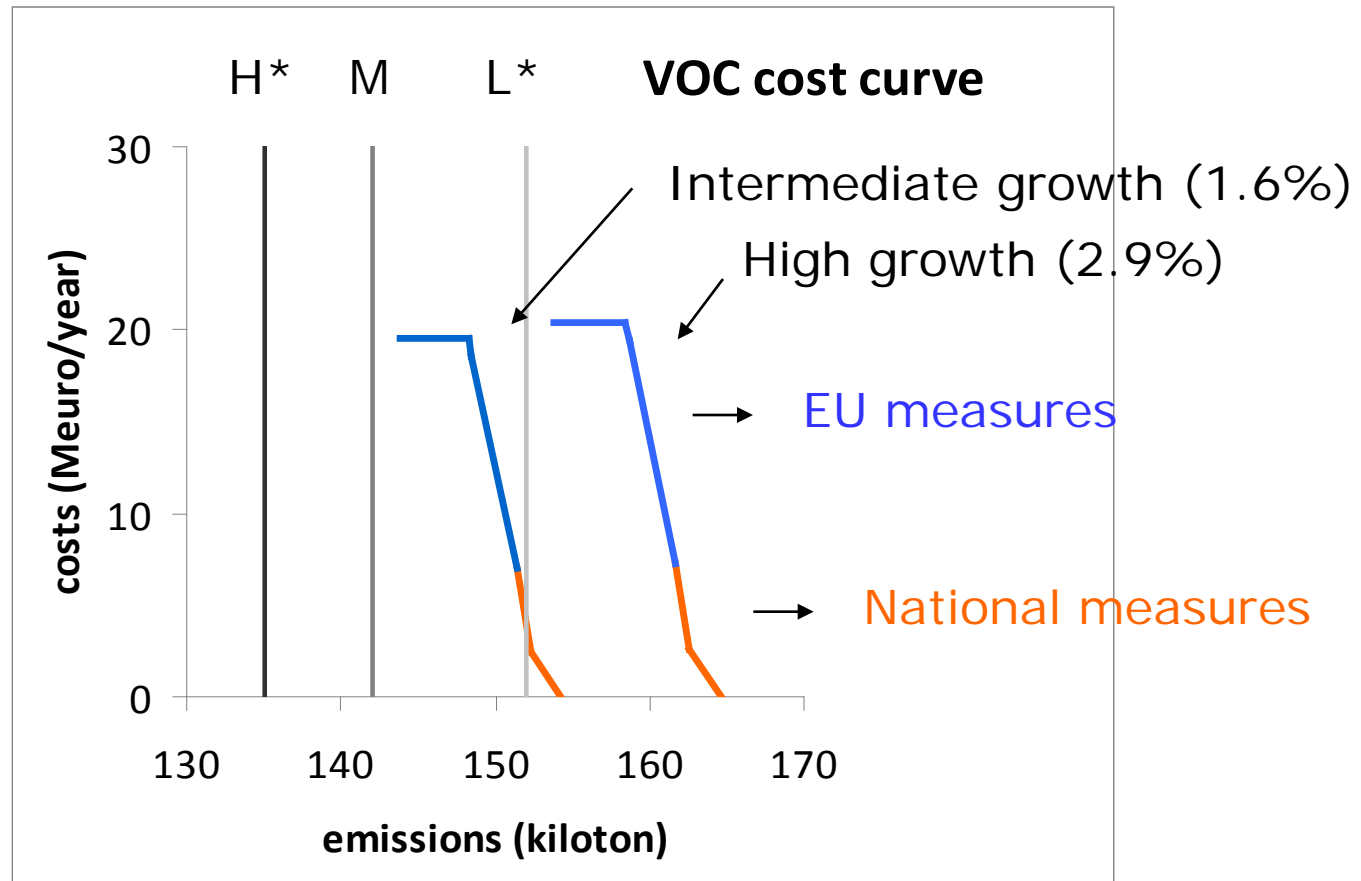
Thanks for your
attention

? VOC reduction costs are uncertain: National and Gains VOC cost curve are quite different?

- The national database considers *less VOC-options with lower cost estimates*
- Differences are not yet explained and need further study
- Options considered in National database are:
 - NL-measures (3 kt)
Further reduction solvent use industry (paints, cleaning and degreasing)
 - EU-measures (7 kt)
Review EU paints directive in line with Ökopol study may 2010
Ökopol-plus: Replacement of deosprays with deorollers (no cost estimate in national curve)

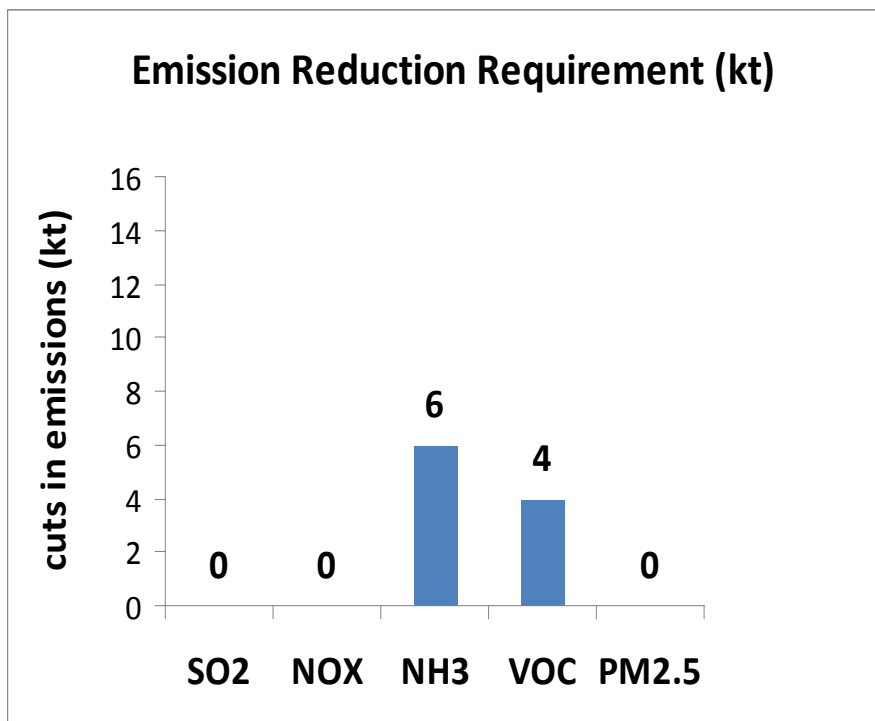


Based on the Dutch Control Options Database the mid-VOC-ceiling is not feasible

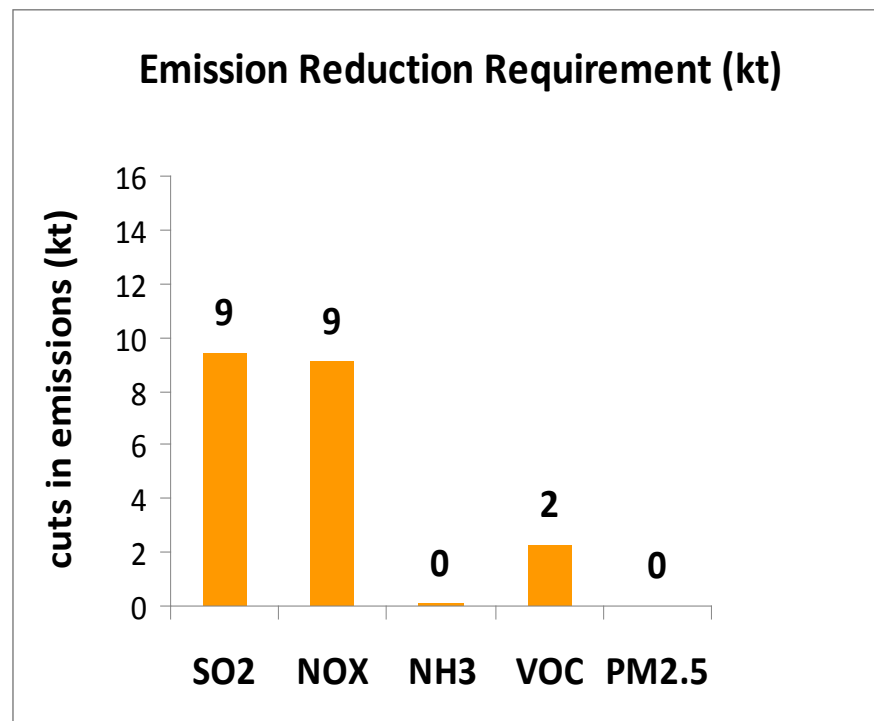


Low* Ceilings - Emission Reduction Requirements

Based on Primes/Gains-BL

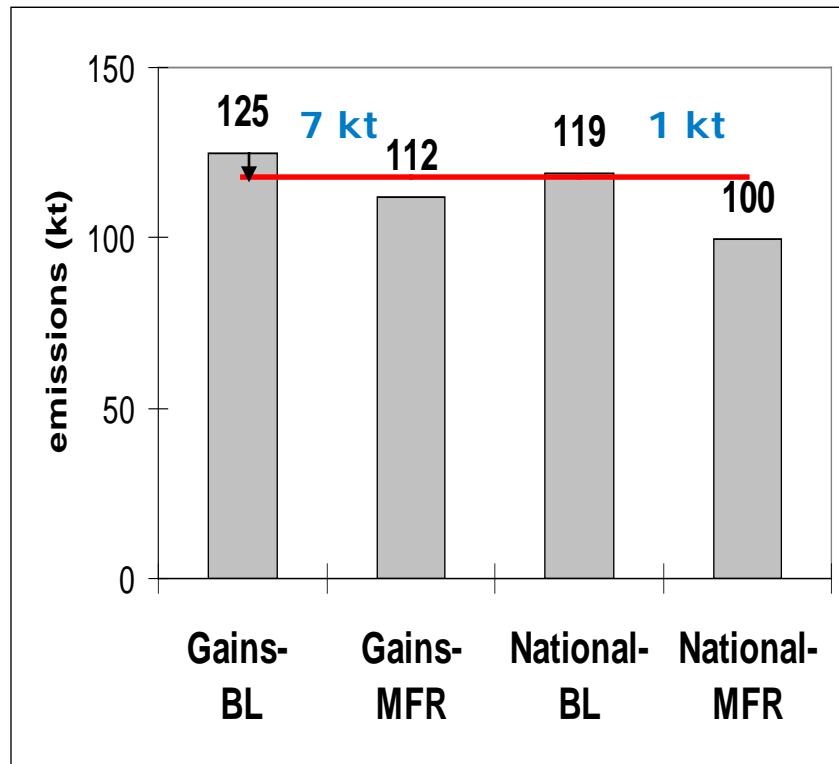


Based on National-BL

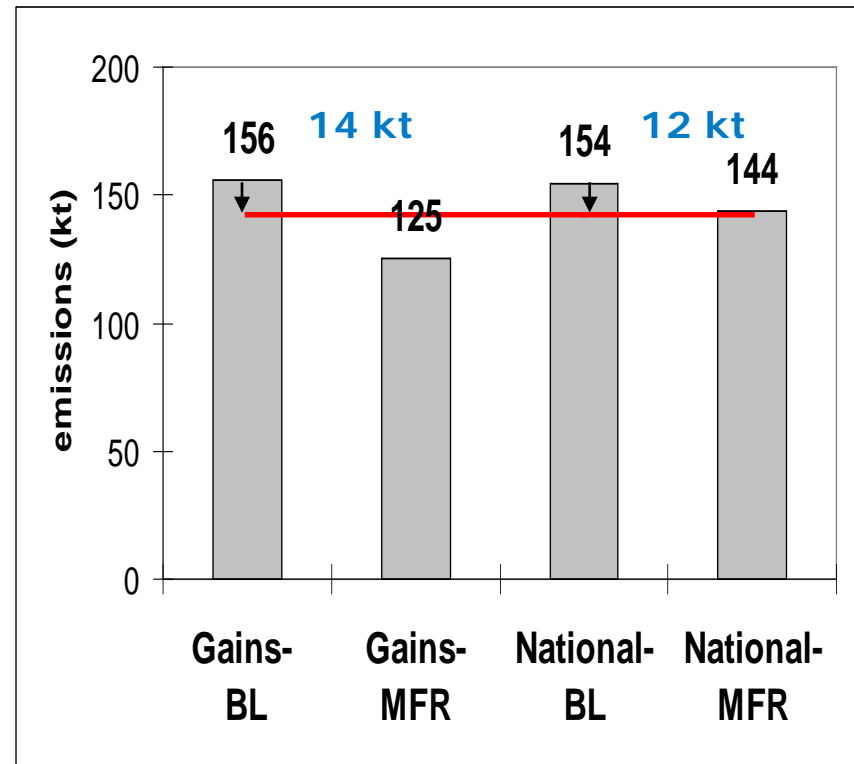


Mid Ceilings - Emission Reduction Requirements based on Gains- and National BL

NH3

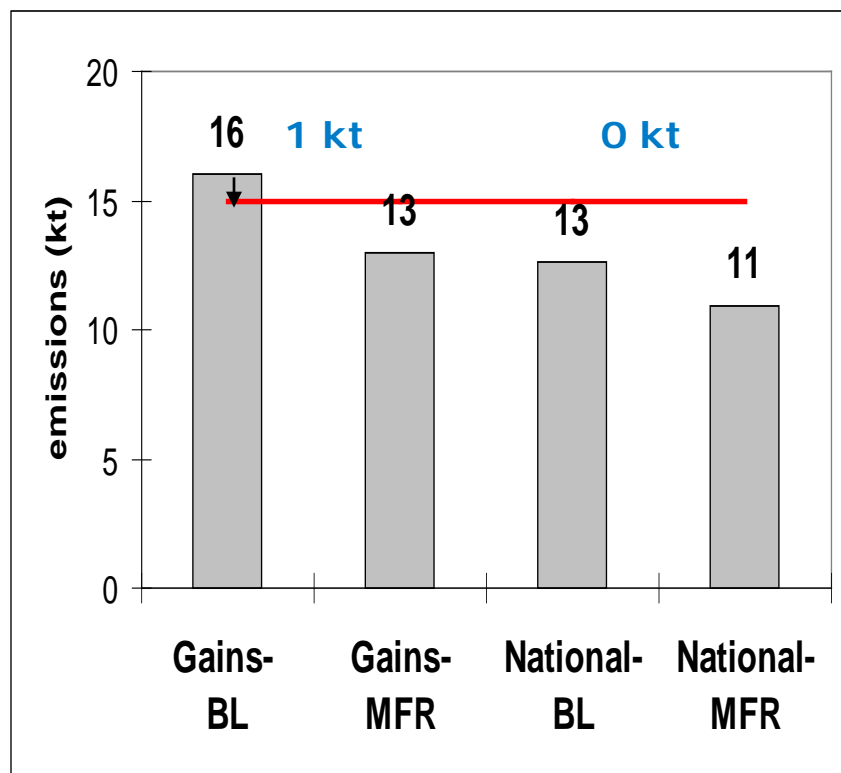


VOC



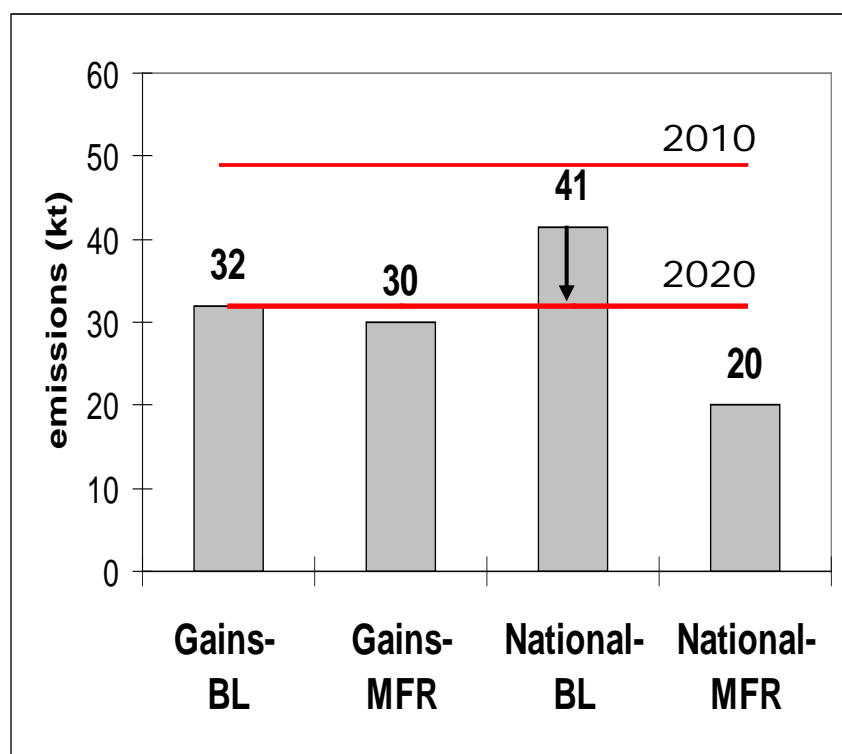
Mid Ceilings - Emission Reduction Requirements based on Gains- and National BL

PM2.5



Mid Ceilings - Emission Reduction Requirements based on Gains- and National BL

SO₂



NO_x

