

Increasing awareness and improving understanding of the costs and benefits

Saltsjöbaden VI Parallel session:
EECCA – on the way to clean air
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Purpose of this presentation

- ➔ To brief on ways to present benefits of reducing emissions of air pollution,
- ➔ To give input to a discussion on whether this type of communication of impacts from action/inaction could be relevant

Disposition

- ➔ Example from EU on identifying cost-efficient emission levels, as support to negotiations,
- ➔ Example from OECD on estimating economic impacts from air pollution if no action is taken

What is Cost-Benefit Analysis

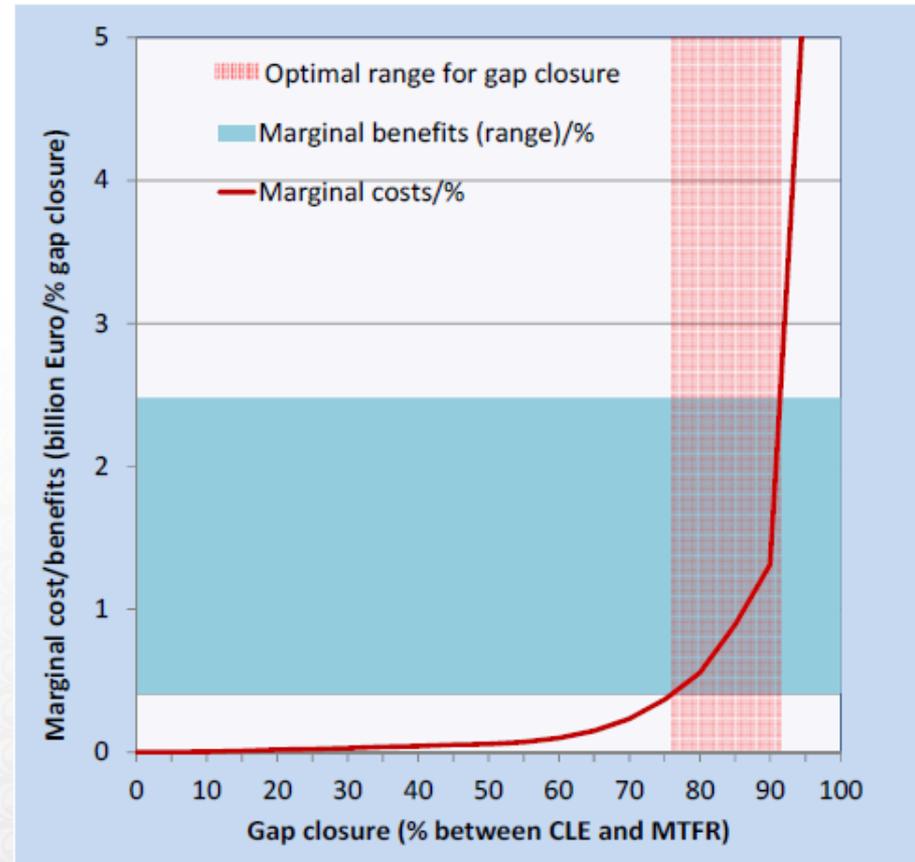
- A CBA compares the costs of emission reductions with the environmental and human health benefits expressed in monetary terms
- The CBA gives support for emission reduction if benefits are larger than costs and/or if marginal benefits are larger than marginal costs
- The “optimal emission level” is the emission level where marginal costs = marginal benefits
- Many controversial issues exist, the three most controversial are:
 - 1. Using utilitarianism as moral guideline for healthy environment and healthy people
 - 2. Method choices and robustness of results in finding monetary values of benefits
 - 3. Discounting of future events

Current health impacts from air pollution with established monetary values – EU average values

Impact indicators	Impact unit	Pollutant	Value (€ ₂₀₁₀) Mean
Acute Mortality (All ages)	Premature deaths	O3 / NO2	57 700
Chronic Mortality (30yr +)	Premature deaths	O3 / PM / NO2	2 220 000
Infant Mortality (0-1yr)	Premature deaths	PM	3 330 000
Chronic Mortality (All ages)	Life years lost	O3 / PM / NO2	57 700
Chronic Bronchitis (27yr +)	Cases	PM	53 600
Bronchitis in children aged 6 to 12	Added cases	PM	588
Bronchitis in children aged 5 to 14	Added cases	NO2	588
Respiratory Hospital Admissions (All ages)	Cases	O3 / PM / NO2	2 220
Respiratory hospital admissions (>64)	Cases	O3	2 220
Cardiovascular hospital admissions (>64)	Cases	O3	2 220
Cardiac Hospital Admissions (>18 years)	Cases	PM	2 220
Minor Restricted Activity Days (all ages)	Days	O3	42
Restricted Activity Days (all ages)	Days	PM	92
Asthma symptom days (children 5-19yr)	Days	PM	42
Lost working days (15-64 years)	Days	PM	130

Analysis of costs and benefits of EU policy proposals

- EU studied air pollution policy in a strive towards cost efficient policy
- Given the options and impacts considered, analysis showed clear economic benefits to society of more stringent EU emission control
- This analysis was used as input to negotiations during 2014-2016

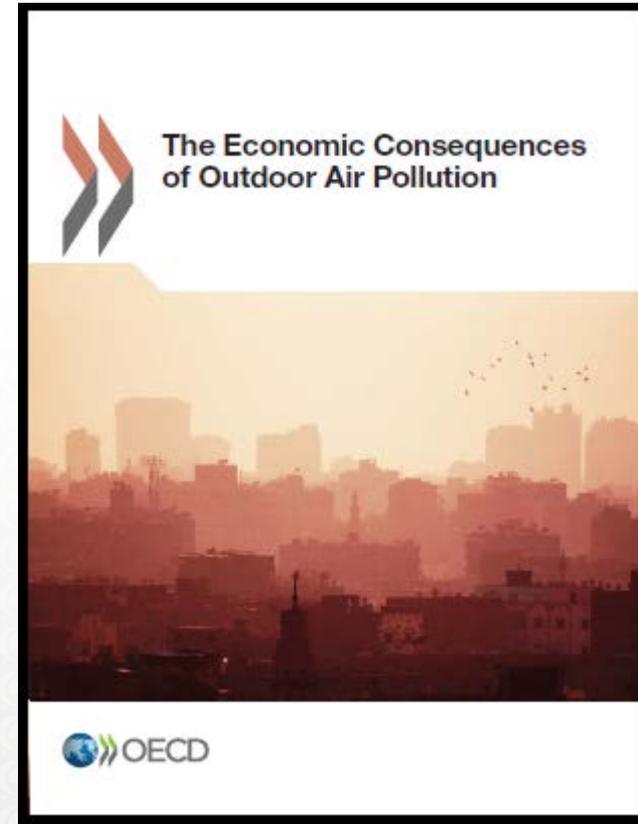


Amann et al., 2014



Analysing costs of inaction (OECD, 2016)

"... the total global welfare costs of outdoor air pollution from all impacts that could be measured in this report are projected to be around USD 3.8 trillion (7% of income; USD 510 per capita) in 2015, and rising to USD 23.8-30.9 trillion (11-14% of income; USD 2 400-3 100 per capita) by 2060. In comparison, the corresponding total welfare costs for the OECD region amount to USD 1.6 trillion (5% of income; USD 1 280 per capita) for 2015 and USD 4.1-4.2 trillion (5% of income; USD 2 880-2 950 per capita) for 2060, respectively."



Air pollution impacts labour productivity

Figure 4.1. Change in GDP from labour productivity impacts, central projection
Percentage change w.r.t. no-feedback projection

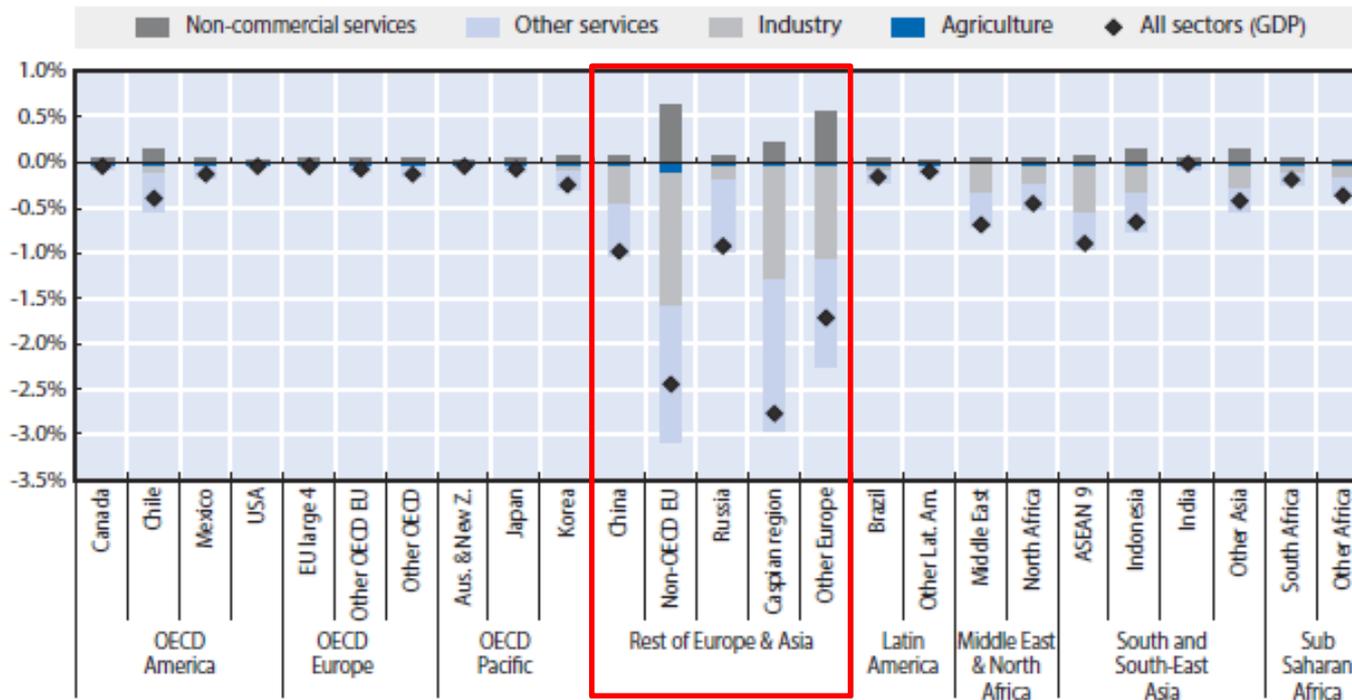
Panel A. Changes in GDP by production factor, 2060



Air pollution affects health expenditures

Figure 4.2. Change in value added and GDP from health expenditure impacts, central projection

Percentage change w.r.t. no-feedback projection, 2060



StatLink <http://dx.doi.org/10.1787/888933357383>

Note: The non-commercial services include health services.

Source: ENV-Linkages model.

Air pollution affects agricultural production

Figure 4.3. Change in value added and GDP from agricultural impacts, central projection
Percentage change w.r.t. no-feedback projection, 2060



Net GDP impact expected to be ~-1.5% - -3% for relevant countries

Figure 4.5. Change in regional GDP from combined market impacts, central projection
Percentage change w.r.t. no-feedback projection, 2060



Thank you

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Extra material

Most important challenges during monetary valuation of benefits

- Our self perception includes more than economically rational decisions. We also care about dignity, self-determination, and moral behaviour*
- “Intrinsic motivation factors” can be reduced by economic incitaments
 - Examples are: blood donation, dropping of at kindergartens,
- When valuation the invornment, we have a hard time adjusting to physichal quantities**
- We also have a hard time with the concept of probability**
- Thinking about money appears to make us self-sufficient and self-serving***
- But, new ideas are under development. Although not yet implemented in the economic standard models and CBA. *

Most important challenges when estimating emission control costs

- ➔ Control options are often modelled, and the design of the models will affect which measures being considered. This in turn affect the estimated emission reduction potential:
 - Greenhouse gas control options with impacts on air pollution are most often excluded from analysis
 - Behavioural changes are most often excluded from analysis
 - LARGE structural changes or societal changes are rarely included
- ➔ Models can have different design (ex: static, or dynamic), which in turn affect size of control costs
- ➔ Experience show that costs often are overestimated*