

Objective

To evaluate the cost and benefit of emission reduction scenarios for traffic in Flanders Belgium. Based on a review of the scientific information and the uncertainties and gaps in the scientific knowledge, it is felt that proximity to traffic is one of the most important and most certain factors that contributes to the health impact of particulate matter. When taking into account the uncertain information both on costs and benefits, is it possible to inform policy makers on the efficiency of reduction measures?

Methods

We use an updated emission inventory for primary PM_{2.5} and PM₁₀ emissions in Flanders.

We develop emission scenarios for traffic for 2010 and calculate the cost of these scenarios.

On the other side benefits of reduced health impacts are valued according to the ExternE methodology, i.e. through a monetary valuation of externalities following an impact pathway approach.

Given different hypotheses for the health effects of particulate matter of traffic, a range of benefits can be derived for the emission scenarios.

Traffic emission scenarios

- S1: BAU scenario, including 10 ppm sulphur in fuel and public buses with CRT
- S2: CRT on 25% of heavy-duty vehicles and buses of type Euro 1, Euro 2 and Euro 3
- S3: Introducing 5% of biodiesel
- S4: Reducing the share of diesels to the level of 2002
- S5: Introducing a 30% share of hybrid diesels
- S6: Sum of S2 to S5

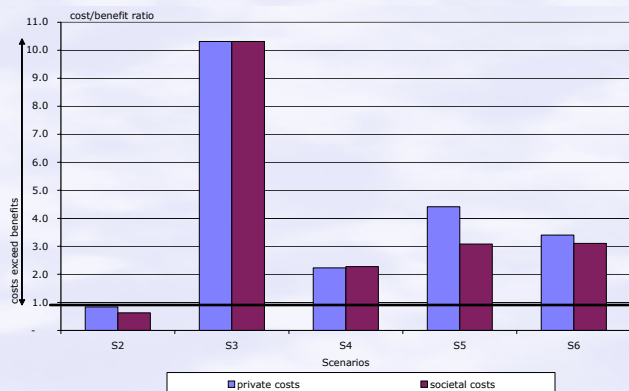


Figure 1: Cost benefit ratios for all scenarios, based on private or societal costs and external benefits

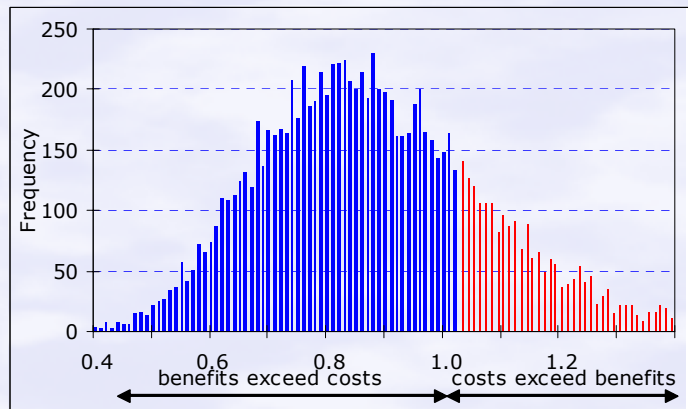


Figure 2: S2 Cost benefit ratio, based on private costs and external benefits, taking into account uncertain benefits

Results

Speeding up extra measures to reduce PM is only beneficial in case of CRT for trucks (S2) (figure 1). Other scenarios cost more than the public health benefit.

Taking into account uncertainty of external costs for health effects of PM, benefits exceed costs with 78% certainty (figure 2).

When trying to achieve a cost/benefit ratio of 1 for S6, the external cost per tonne of PM_{2.5} emitted has to increase by a factor of 3.4. This is an unrealistic high external cost for PM.

Secondary benefits?					
	S2	S3	S4	S5	S6
through CO ₂	-	-	-	+	0/-
through NO _x	0	-	0/+	+	0/+
through SO ₂	0	0	0	0	0
through VOC	+	0	-	0	-

- = negative; + = positive; 0 = no effect.

Secondary benefits are either negative, reducing benefits or positive but too small to change the cost-benefit ratio

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