

Background paper to the workshop on NTM

Göteborg, 7-8 December 2005

by Rob Maas, MNP

Background

Technical measures in RAINS have the advantage that they are relatively easy to implement, without a substantial change in the physical infrastructure, public institutions or in consumer behavior. Behavioral changes often seem less costly. Eating less meat, driving more slowly, using public transport, wear a pullover & use less heating, spend the holiday in the garden instead of in Patagonia or Mongolia, move cattle away from sensitive ecosystems, all are very cost-effective ways to reduce air pollution, but how can they be implemented? Sometimes we can use regulation (e.g. speed limits) although enforcement will be harder and more costly than with the simple add-on techniques, but often we need financial incentives and a change in the tax system, which could require a long period of debate with ministries of finance. Nevertheless it would be useful to have - as a result of the workshop - an inventory of possible additional measures that are not incorporated in RAINS, with their potential contribution, costs, implementation instrument and (political) feasibility.

Scope: ‘non-technical measures, structural change and local policy options’

I would suggest adding ‘structural changes’ and ‘local policy options’ to the title of the workshop. Behavioral changes are often interlinked with technical solutions, e.g. buying products that use less energy. We are interested in all technical and non-technical measures, that are not in RAINS, such as shifts in the urban car-fleet, cleaner busses, use of residual industrial heat in households, clustering of animals in larger (and cleaner) stables at a larger distance from sensitive nature areas, etc.

Furthermore it would be useful to distinguish two types of structural and non-technical measures: specific local measures and generic (nation wide) measures.

Local measures

As hotspots are in the focus of the attention in any air pollution strategy, it is important to assess to what extent local measures are more cost-effective than EU-wide measures. EU-wide measures would also reduce emissions in areas where risks to health and environment are small, and where benefits thus are smaller than in hotspot areas. Hotspot areas are both the industrialized & urbanized areas with high densities of fossil energy use close to the population, and the rural areas with high densities of cattle close to sensitive ecosystems.

Outcome of the workshop could be a credible estimate for the potential of local measures to reduce the environmental pressure in hot spot areas, as well as their costs. Such estimates can be used as additional (exogenous) abatement measures in RAINS in certain grid cells.

Such measures should not be hypothetical, that is why it is good to see whether there is practical experience, information about costs, institutional limitations, and possibilities to

implement the measures (e.g. with regulation, economic instruments, spatial planning instruments).

In urban areas measures that can be considered include speed limits, road user charges (depending on the type of car?), traffic circulation schemes, parking fees, car-free city centers, zero-emission busses and taxis, measures to reduce ship emissions in harbours, increase the use of industrial heat for heating of buildings, etc. Co-operation and information exchange between cities could reduce abatement costs, e.g. when all cities apply the same type of zero-emission bus it could lead to economies of scale and rapid learning in the production of such busses.

In rural areas shifting cattle away from sensitive nature areas could be considered, as well as additional regulation for farmers close to sensitive areas (e.g. cleaner stables, keeping cattle in stables).

Generic measures

The extension of RAINS with measures aimed at reducing greenhouse gasses increases the maximum technically feasible reduction potential for air pollutants considerably. Including these options would also significantly reduce the costs of the add-on abatement measures (this result was found in many countries, e.g. Italy, Netherlands, Sweden, China and the USA). First results of the extended RAINS-model (GAINS = Greenhouse Gas Interactions and Synergies model) could be presented during the workshop. GAINS mainly includes measures like fuel switch and reductions in fertilizer use, but it takes developments energy demand as given (output of the PRIMES - energy model). Also the vehicle mileage and meat demand are exogenous.

It is probably not easy to define a realistic potential of generic changes in behavior, such as eating less meat, driving less kilometers or using less energy. Technically it can be anywhere between 0 and almost 100%, depending on the policy instrument we use. If we tenfold the tax on meat or petrol the potential will be large, but the political feasibility is small. We would need more knowledge about the price-elasticity of the demand for meat, petrol, electricity, gas and coal. We should be aware of the environmental effects of the use of substitutes and the shifts in consumption patterns. For a coherent picture we would have to use models like PRIMES and TREMOVE. But then, is it possible to define a realistic tax increase on products like meat, petrol, electricity, gas and coal? Often the disadvantage is that such levies do hardly affect the richer part of the population. In order to reduce this inequity, a change in income tax structure could be considered, but then our discussions with the ministers of finance would become even more complex.

Perhaps we could make life easier when we limit our analysis to an arbitrary sensitivity-analysis for generic changes in behavior of consumers throughout Europe, e.g. assume that we consume (and produce) 10% less meat, that we decrease our car mileage by 10% or that we decrease the demand of electricity and heating by 10%, as compared to the baseline. These percentages are not completely unrealistic. E.g. RIVM has calculated that eating more healthy (less fat) could reduce ammonia-emissions by around 10%. Experiences with road user charges come up with an effect of around 10% less traffic.

And 10% less demand for electricity and gas could be reached quite easy with a doubling of energy prices (which is not unrealistic if we look at the fluctuations in oil prices). The question is whether we could also assume some reduction in the transport of goods. 10% less transport, would also include 10% less 'world trade', and trade is seen as the driver of economic growth. Such a reduction seems hardly feasible from a political point of view. A 10% shift from road transport to rail or ship would imply roughly a doubling of rail and inland waterway capacity.

Cost estimates

Can the costs on non-technical measures be compared with the annualized costs of investments in technical measures? We clearly cannot simply compare increased taxes (for energy, parking, etc) with investment costs in energy saving and abatement of air pollution. But may we add the GDP-loss due to less meat production to the cost-curve? And what about the GDP-loss due to less energy-production? How do we value the changes in traveling time due to speed limits or the use of public transport? My advice would be not to give these problems a high priority, but focus the workshop on the estimates for the potential contribution of 'non-technical' measures to the abatement strategy.