

F.A.O Dr Catherine Kling,  
US EPA Environmental Economics  
Advisory Committee

18 January, 2011

Dear Dr Kling,

I understand that the Environmental Economics Advisory Committee (EEAC) is developing a white paper on the valuation of mortality risk reductions associated with measures to reduce the concentration of pollutants in ambient air.

This is an issue of great interest in Europe and has been, and continues to be, explored as part of the requirement to develop cost-effective measures for improving human health by abating emissions from anthropogenic sources. It is a significantly difficult topic to address and, particularly, to communicate to stakeholders.

The major focus has been on the mortality risk associated with ambient particulate matter and the practical changes in concentrations and in benefits that can be achieved by emission reduction measures. The consensus opinion, based on epidemiological evidence and advice from the WHO is that exposure to  $PM_{2.5}$  contributes a risk increment to mortality risk (taken as all cause mortality risk for simplicity) and hence reducing life expectancy by an amount that is population specific (i.e. recognises that life expectancy has variation). The approach to "valuation" has sensibly been to solicit (by means of representative population survey) the willingness to pay for the increases in life expectancy that might be expected to result from a risk mitigation intervention.

This is a far from easy task. I would like to draw your attention to two closely related studies. One conducted for the UK Government ("DEFRA study") was unique in that it solicited responses for life expectancy gains enjoyed in both good and poor health. It demonstrated that there was good awareness of the issue and also that the valuation did not increase linearly with increasing benefit but evidenced a maximum. This was supported in a much larger supporting study, that now forms the basis for the EU policy work, was funded by the Commission and has title "NEEDS". Both reports are enclosed for your information.

There remains an important issue of how to communicate the results of these studies and derive what the policy maker would like which is a single yardstick for the value of a life year gain in life expectancy. The studies show a very skewed response with a majority of expressed choices having a low value and a few choices a high value. The result is that the distribution mean is greater than the median which is greater than the mode. A yardstick based on the mean therefore reflects and is sensitive to the view of the few rather than the many. It has been argued (for example in the European Commission Clean Air For Europe program, using results from the NEWEXT study that was the forerunner of NEEDS) that the median (50 vote less, 50 vote more) is a more robust single statistic. If a single number has to be used then CONCAWE supports using the median but we believe the best way forward is to retain full

expression of the range of values for use of stochastic simulations in deriving cost/benefit outcomes.

Another extraordinarily difficult task in communicating such valuations is to preserve the sense of purpose. There is a great danger, having monetised the risk reduction, that this is seen as a tangible resource to be realised. The costs of emissions reduction remain and must be borne. The benefits are a welcome reduction in morbidity (which tangibly improves quality of life but scores "low" in monetary terms) and a small additional contribution to the ongoing reduction in mortality risk that has, in Europe, seen an increased in life expectancy of more than 10 years since I was born and which presents its own societal challenges.

I hope you find the enclosed papers useful to the work of your committee. Both can be found on the internet.

The NEEDS report is at [http://www.needs-project.org/RS1b/NEEDS\\_RS1b\\_D6.7.pdf](http://www.needs-project.org/RS1b/NEEDS_RS1b_D6.7.pdf)

and the DEFRA report is at:

[http://www.defra.gov.uk/environment/quality/air/airquality/publications/healthbenefits/airpollution\\_reduction.pdf](http://www.defra.gov.uk/environment/quality/air/airquality/publications/healthbenefits/airpollution_reduction.pdf)

Yours sincerely

Pete.

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