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Assessment of Past, Present and Future Health-Cost Ex-ternalities of Air Pollution in Europe and the contribution from International Ship Traffic using the EVA Model System

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An integrated model system, EVA (Economic Valuation of Air pollution), based on the impact-pathway chain has been developed, to assess the health-related economic externalities of air pollution resulting from specific emission sources or sectors. The model system can be used to support policy-making with respect to emission control. In this study, we apply the EVA system to Europe, and perform a more detailed assessment of past, present, and future health-cost externalities of the total air pollution levels in Europe (including both natural and anthropogenic sources), represented by the years 2000, 2007, 2011, and 2020. We also assess the contribution to the health-related external costs from international ship traffic with special attention to the international ship traffic in the Baltic and North Seas, since special regulatory actions on sulphur emissions, called SECA (sulphur emission control area), have been intro-duced in these areas,. We conclude that despite efficient regulatory actions in Europe in recent decades, air pollution still constitutes a serious problem to human health, hence the related external costs are considerable. The total health-related external costs for the whole of Europe is estimated at 803 bn Euro/year for the year 2000, decreasing to 537 bn Euro/year in the year 2020. We estimate the total number of premature deaths in Europe in the year 2000 due to air pollution to be around 680,000/year, decreasing to approximately 450,000 in the year 2020. The contribution from international ship traffic in the Northern Hemisphere was estimated to 7% of the total health-related external costs in Europe in the year 2000, increasing to 12% in the year 2020. In contrast, the contribution from international ship traffic in the Baltic Sea and the North Sea decreases 36% due to the regulatory efforts of reducing sulphur emissions from ship traffic in SECA. Introducing this regulatory instrument for all international ship traffic in the Northern Hemisphere, or at least in areas close to Europe, would have a significant posi-tive impact on human health in Europe.