

Estimation of external costs from short sea shipping. The concept of externalities surcharge

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Abstract:

The air emissions from shipping can lead to various damages, which the most relevant are the health impacts due to air pollutants but also relevant are damages to various materials or buildings and monuments, biodiversity and crop losses. The main objective of this study is to present an analytical methodology to estimate the external costs of air emissions from short sea shipping. External costs, or as it has been called externalities are interpreted as the cost of the impacts that arise from the activities of a group of people to another group of people. In the case of short sea shipping: from the impacts of air emissions due to passenger ferries at the local communities of ports of Crete.

External costs are not something simple to calculate and take into account and in most cases this cost is not acceptable by the group of people who cause it, while argue that externalities should not be considered at all for their sector due to the social nature of their activity. Actually this point of view is not very realistic since though maritime transportation promotes economic growth and removes isolation between different geographic areas but also contributes to the air pollution. In order to evaluate the costs and benefits of shipping to society, it is necessary to consider all costs, including the external costs of air pollutants.

There are two levels of calculations which results to the total external costs per pollutant. At the first level by applying a bottom-up approach we calculate the total annual air emissions (CO₂, SO_x, NO_x, PM_{2.5}, PM₁₀) and in the second level we use as input values the cost factor per pollutant to finally estimate the annual total external costs. In our case study we observe some important findings about the amount of externalities which are about 25-35% compared to shipping companies' revenues, which probably means significant revenue loss if they called to pay. Assuming that shipping companies will pass these costs to ticket fares the concept of externalities surcharge arises and we make an attempt to allocate this surcharge per transportation category.