

9 Environmental performance of households

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Abstract

In this study we discuss and apply ways to assess sustainability of household consumption. We propose an integrated environmental-economic model system providing a basis for identifying products or family types representing high environmental pressure. By using this model system, it is possible to develop a general environmental performance index, including weighting the pressure of numerous environmental impacts. We find that middle income families living in single family homes have the least environmentally friendly consumer basket and also constitute a large share of all families in Denmark. Thus, environmental policy measures should be directed towards middle income families living in houses.

9.1 Introduction

Household consumption pattern is a key variable in understanding, assessing and reducing the environmental pressure of the economy. Different family types have different lifestyles, requiring different goods and services, each associated with environmental pressure. Ultimately, all goods are, directly or indirectly, produced for household consumption, either within the producing country or abroad. Since consumption is related to a

large number of different types of environmental pressure, it is important to include all types of relevant environmental impacts, by e.g. estimating emission profiles. The advantage of emission profiles is that they provide much more information than a single environmental indicator such as energy consumption or CO₂ emissions. The drawback, however, is that large amounts of information may be difficult to interpret. A shift in commodity mix may have multiple effects, e.g., increasing CO₂ emissions and decreasing NH₃ emissions. Due to these multiple effects, it is hard to assess unambiguously whether improved environmental performance is actually achieved or not. Consequently, to reduce complexity, there is a need to weight different types of environmental impacts according to their relative importance, to form a broad environmental performance index, aggregated across environmental impact types.

Weighting together different environmental pressure types requires proper weights. From a neo-classical economic point of view, the ideal environmental index would measure the change in social welfare resulting from the change in environmental pressure. To aggregate across different types of environmental pressure, that is, to weight different types of environmental goods (or 'bads') together, weights should be assigned to each pressure type according to society's preferences. According to neo-classical theory, these preferences, or more specifically, marginal utilities, are revealed by market prices. However, environmental goods are not often supplied and demanded in any market, and hence, have no observable prices. Thus, market imperfections or lack of property rights mean that no such market prices normally exist for environmental pressures¹. In the economic literature, this kind of market imperfection is described as 'external costs', meaning that environmental damage costs caused by the producer are passed on to society. In Munksgaard et al. (2005), we applied damage cost estimates to weight environmental impacts. For many types of environmental impact, however, damage cost estimates are not available, and this is also the case for some of the impacts considered in the present study. Instead, we suggest an alternative based on a scoring approach in combination with Data Envelopment analysis.

¹ Markets for emission permits have evolved from national targets for the reduction of e.g. CO₂ and SO₂. Reduction targets, however, are not necessarily founded on a strict trade-off between marginal damage costs and marginal abatement costs, as is required in economic theory.