
Ancillary benefits – new prospects for global challenges

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1 Global challenges and ancillary benefits

Ancillary benefits may provide new prospects for global environmental policies. Ancillary benefits are additional to the benefits derived from a policy's primary aim and, consequently, raise the policy's attractiveness. However, ancillary costs may also arise.

This paper gives a short introduction into the issue of ancillary benefits and costs and criticises the biased standard analyses in economics focusing exclusively on the investigation of a policy's primary aim.

Several global challenges raised public and scientific attention during the last decades. Among them are biodiversity loss, climate change, ozone layer depletion, nuclear risks, terrorism, the AIDS epidemic and the pollution of oceans. Policies aiming at the mitigation of global problems are referred to respectively: there are policies against terrorism, climate policies, etc. However, sometimes it is far from being obvious what a policy's primary aim is. Is reforestation a policy to combat global warming or to protect biodiversity? Is the abatement of CFCs an ozone layer protection policy or a climate policy? Is medical aid for developing countries in the shape of immunisation of people a peace preserving policy by stabilising poorer regions or is its primary aim to protect the whole world against illnesses?

Yet, a policy may not only affect different global issues, but may just as well have consequences on different regional levels. Consequently, it is not always obvious how such a policy should be appropriately addressed: Is a policy that reduces the burning of fossil fuels a climate policy or a policy to combat *regional* air pollution, for

example. Is an eco-tax whose revenue is used to reduce labour costs a policy to protect the global environment or a policy to raise *a country's* employment level?

These questions seem to be irrelevant at first sight, but they are not when we consider economic analyses.

2 Cost-benefit analyses and ancillary benefits

In general, standard economic analyses focus on a policy's primary aim. Therefore, we need to define a primary aim. Then, economic analyses compare the benefits of the policy derived from achieving its primary aim, i.e. the primary benefits, with the policy's costs. The intention of such a biased cost-benefit analysis is to find the efficient policy level. Since only primary benefits are considered, the determined 'efficient' levels are generally not efficient at all. Let us illustrate this by the example of a climate policy which reduces road traffic. Evaluating the policy's benefits by considering only the benefits of the alleviation of the warming threat would underestimate the attractiveness of this policy since it also provides benefits which are associated with a reduction of noise, traffic jams, accidents and road surface damage [1–3]. By taking account of these ancillary benefits or co-benefits in the cost-benefit analysis, a policy's benefits rise compared to its costs, i.e. the policy's attractiveness increases. Consequently, integrating ancillary benefits into the analysis yields an efficient policy level which is higher than the 'efficient' level determined in a cost-benefit analysis only taking account of primary benefits [4–6].

The integration of ancillary benefits into the analysis is of special importance where the mitigation of global environmental problems like global warming is a minor policy objective. As Aunan *et al.* [7, p.8] point out: '*Whereas the climate change issue may not be given high priority on the political agenda, there is in many developing countries an increasing focus on local and regional pollution problems.*' Hence, for such countries, ancillary benefits may be the main incentive to introduce environmental protection measures from which the global environment benefits, i.e. global environmental protection represents the ancillary effect from these countries' point of view while local or regional pollution mitigation is their primary aim. Then, incentives to implement those measures protecting the local and regional environment which are accompanied by the highest global benefits, could be reinforced by means of technological and financial transfers from other countries having a stronger interest in global environmental protection.

3 Ancillary benefits and costs

However, environmental policies may also cause ancillary costs [8, p.3]. A climate protection measure in the shape of a switch from gasoline as a fuel for cars to diesel, for example, reduces the emissions of CO₂. However, such a switch would raise the emissions of the pollutant PM_{2.5} [9, p.465].

In general, ancillary costs and benefits vary among regions. Positive and negative employment effects of the intensified use of technologies associated with renewable resources are expected within the European Union, for example. The European

Commission intends to achieve a 12%-contribution by renewable sources of energy to the European Union's gross inland energy consumption by 2010, which will be accompanied by a significant reduction of CO₂ emissions [10, pp.11,12]. It is predicted for 2010 that a net of up to 720,000 jobs is directly created in the renewable energy sector and indirectly in the sectors that supply the energy sector [10,11]. The gross impact is even higher than the net effect, since there will be a simultaneous loss of jobs in some other sectors. Consequently, the positive employment effects of the intensified application of technologies associated with renewable resources will mainly take place in regions where such technologies are considered to be a chance for business. Regions which are stuck with conventional technologies and use of non-renewable resources like coal will mainly face negative employment effects.

4 Ancillary effects – a complex issue

Finally, we have to admit that the integration of ancillary benefits into the analysis does not only raise the attractiveness of global environmental policies, it also makes the analysis more complex. Since many co-effects are of regional or local character, global environmental policies cannot be treated as pure public goods anymore. It is more appropriate to consider such policies as impure public goods [12,13]. However, often ancillary benefits are easier to evaluate than primary benefits, especially when they only have a local or regional character [14–16].

Because of the complexity of the topic it is not surprising that the contributions to this special issue are quite heterogeneous. The analyses investigate several different ancillary aspects of global environmental protection. The methodology, regional focus, considered benefits and policy examples vary among the individual contributions. However, similarities are also discernible, e.g., most of the contributions focus on climate protection as a policy's primary aim. So, the article of Fichtner *et al.* deals with the implications that different assumptions with respect to the economic and political framework have for climate policy, and analyses its possible co-effects on the abatement of NO_x and SO₂ emissions.

Proost and Van Regermorter also investigate climate policy and take into account its ancillary effects in the shape of the associated reduction of local air pollution. They investigate both the effects of climate policy on local air pollution and the impact of local air pollution mitigation on greenhouse gas emission levels. Finally, the efficiency gains of a joint pursuit of both policy goals are determined.

Aunan *et al.* present and compare the results of bottom-up, semi-bottom-up as well as top-down studies that consider air pollutants reductions which are associated with greenhouse gas mitigation policies. They show that the study design has impacts on the estimated co-benefits per ton carbon reduced.

Ringel analyses secondary benefits of climate policies which consist of the simultaneous fulfilment of energy policy's aims. Markandya *et al.* also take account of energy policy's aims when they analyse energy policies' climatic as well as air-pollution-related effects.

A different issue is addressed by Kuhn *et al.* who analyse the topic of recycling. They take account of different effects of recycling measures, i.e. the saving of inputs and the reduction of waste. These effects, again, have several different environmental implications.

References and Notes

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- 4 Besides the terms 'ancillary benefits' and 'co-benefits', the terms 'side benefits', 'secondary benefits', 'collateral benefits', and 'associated benefits' are used [5]. As Markandya and Rübbelke [6] point out: 'The main difference is the relative emphasis given to the climate change mitigation benefits versus the other benefits. For some policies these "other benefits" may be as important as the GHG reduction benefits, in which case the term "co-benefits" is more appropriate.'
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- 13 Rübbelke, D.T.G. (2002) *International Climate Policy to Combat Global Warming – an Analysis of the Ancillary Benefits of Reducing Carbon Emissions*, Cheltenham: Edward Elgar.
- 14 With respect to the global challenge of climate change, Boyd, Krutilla and Viscusi [15] stress: 'Although assessing environmental damages is not an easy task, it would seem substantially easier than assessing the impact of global warming damages'. It has to be considered that the primary benefits of climate policy arise with a delay of about 50 years, while its ancillary benefits, in general, occur immediately after the implementation of the policy. If benefits can be enjoyed only after a long delay, questions about the correct discounting of future utility arise [16].
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