

Interdisziplinäres Fernstudium Umweltwissenschaften - **infernum**

The Economics of International Environmental Problems

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The Economics of International Environmental Problems

von

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Impressum

Titel: The Economics of International Environmental Problems

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Kursnummer: 71362

Studienangebot: Interdisziplinäres Fernstudium Umweltwissenschaften (infernum)

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| | |
|---|----|
| A. Introduction..... | 3 |
| B. International Environmental Agreements | 5 |
| I. The Game Theoretic Interpretation | 5 |
| 1. Global Optimum and Nash Equilibrium | 5 |
| 2. The Problem of Incentive Compatibility: Individual Rationality and Stability of International Environmental Agreements | 17 |
| 3. An Alternative Mode of Exposition: Global Environmental Problems as a Static Prisoners' Dilemma | 24 |
| 4. Generalisations of the Game Structure | 27 |
| a) Introduction..... | 27 |
| b) Dynamic Games..... | 27 |
| c) Risky Payoffs | 29 |
| d) Consequences | 30 |
| 5. How to Increase the Propensity to Cooperate | 31 |
| a) Internal Incentives for Participation and Stabilisation..... | 31 |
| b) External Incentives for Participation and Stabilisation | 33 |
| 6. International Environmental Coalitions | 36 |
| 7. Perspectives of the Game Theoretical Analysis of Global Environmental Problems | 41 |
| 8. Epilogue | 42 |
| II. The Economics of the Kyoto Protocol | 45 |
| 1. A Brief Review and Assessment..... | 45 |
| 2. Perspectives..... | 52 |
| C. EU-Emission Trading..... | 56 |
| I. A Brief Review | 56 |

| | |
|--|----|
| II. Transferable Discharge Permits and the Environmental Economist's Measuring Rod | 57 |
| III. An Economic Assessment of the EU-Emissions Trading System | 60 |
| 1. Ecological Accuracy | 60 |
| 2. Cost Effectiveness | 62 |
| 3. Dynamic Push..... | 70 |
| 4. Climate Policy as Stock Management | 71 |
| 5. Compliance | 73 |
| IV. Conclusions | 74 |
| Solutions to the exercises | 79 |
| References | 86 |

A. Introduction

In introductory environmental economics it is usually (and mostly tacitly) assumed that the *spatial distribution* of pollution is not a relevant issue. The fundamental economic analysis of internalizing externalities (like Pigouvian taxes) and standard oriented environmental policy instruments (like transferable discharge permits) uses models where the dimension of space (and also the dimension of time) is ignored. If, exceptionally, spatial issues are dealt with, it is very often assumed that they can be managed by the national environmental policy maker.

Introductory environmental economics: no space, no time
Grundlagen der Umweltökonomie: Modelle ohne Raum und Zeit

However, pollution does not stop at country borders. This is quite trivial – but it is also true, and very consequential for environmental economic theory as well as practical environmental policy. The spectrum of international environmental problems ranges from the conflicting use of eco systems overlapping the borders between neighbouring countries to world wide (“global”) problems like the destruction of the ozone layer and the *greenhouse effect*. It is this latter effect which has received enormous attention in the recent public debate. This debate spans from the remote circles of environmental economic theorists to the sparkling arena of international policy making.

Transboundary and Global Effects
Grenzüberschreitende und globale Umwelteffekte

Dealing with international environmental problems in this course we will concentrate on the “polar case” of supra nationality, i.e. *global* environmental issues. The core feature of a global emission problem is that it is generated by pollutants which produce their detrimental effects irrespective of where they originate from. Take the greenhouse effect as an example. According to the present state of knowledge generated from the natural sciences the extent of *global warming* depends on aggregate emission of greenhouse gases but not on their original emission profile.¹ The same holds true for CFC-emissions destroying the ozone layer.

Global Warming
Treibhauseffekt

CFC
FCKW

Many of the fundamental insights of traditional environmental economic theory as presented in the courses of module 4 of *Infernum* can be applied to the global problem sketched above. However, there is an important difference:

In the national context environmental economics assumes that there is a central agency (“the government”) willing and able to design and enforce environmental policy. This is assumed to be true even if the interests of some groups of society are violated. In the light of a *public choice perspective* this hypothesis is somewhat doubtful even in the national context. In an international setting, however, it is completely inappropriate. Since there is no “world government” international environmental policy has to be agreed upon among voluntarily participating sovereign countries. None of these countries can be assumed to join an agreement on

Voluntary Agreements
Freiwillige Vereinbarungen

¹ The most important greenhouse gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), chlorofluorocarbons (CFCs), and ozone (O₃).

global environmental issues in case the respective government expects to lose social welfare as a result of participation. Unfortunately, this negative expectation is not so unlikely to occur, according to the literature.

Prisoners' Dilemma
Gefangenendilemma

This is so since in this literature global environmental problems are most often stylized by the *prisoners' dilemma* game (see section B. I.3 for details). The incentive structure of this game is most detrimental to cooperation: All countries would benefit from agreeing upon coordinated environmental policy. However, from the perspective of each individual country a situation even better than the one achieved by full cooperation would be attained by taking a *free ride* on the agreement. However, if all countries follow the incentive to take a free rider position no agreement would be reached and the regretful uncooperative *status quo* prevails.

Overview
Überblick

In chapter B, below, we will first (B.I) analyze the *coordination problem* of global environmental policy, sketched above, as well as the attempts to make amends, from a theoretical point of view. Then (B.II), we will apply the theory to the most prominent international environmental agreement, the *Kyoto Protocol* on global warming. In the subsequent chapter C we will turn to specific issues of instrumental design in the international environmental policy arena. For this topic we choose the *emissions trading* scheme which has been introduced by the European Union as an example.