

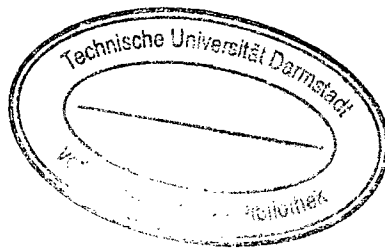
# Handbook of Environmental and Resource Economics

*Edited by*

Jeroen C.J.M. van den Bergh

*Professor of Environmental Economics*

*Free University, Amsterdam, The Netherlands*



**Edward Elgar**

Cheltenham, UK • Northampton, MA, USA

---

# Contents

---

<i>List of figures</i>	xi
<i>List of tables</i>	xiv
<i>List of contributors</i>	xvii
<i>Preface</i>	xxiii
<i>Acknowledgements</i>	xxv

## PART I INTRODUCTION

1 An overview of environmental and resource economics	3
<i>Jeroen C.J.M. van den Bergh</i>	
2 A short history of environmental and resource economics	32
<i>Thomas D. Crocker</i>	

## PART II ECONOMICS OF NATURAL RESOURCES

3 Optimal extraction of non-renewable resources	49
<i>Cees Withagen</i>	
4 Imperfect competition in natural resource markets	59
<i>Cees Withagen and Aart de Zeeuw</i>	
5 Economics of mining taxation	68
<i>Philip A. Neher</i>	
6 International trade and natural resources	75
<i>Ngo Van Long</i>	
7 Indicators of natural resource scarcity: a review and synthesis	89
<i>Cutler J. Cleveland and David I. Stern</i>	
8 Renewable resources: fisheries	109
<i>Colin W. Clark</i>	
9 Renewable resources: forestry	122
<i>Thomas Aronsson and Karl-Gustaf Löfgren</i>	
10 The economics of water use	141
<i>David Zilberman and Leslie Lipper</i>	
11 Agriculture and the environment	159
<i>James S. Shortle and David G. Abler</i>	
12 The economics of energy	177
<i>Jan Willem Velthuisen and Ernst Worrell</i>	

PART III ECONOMICS OF ENVIRONMENTAL POLICY

13	Externalities <i>Erik T. Verhoef</i>	197
14	Endogenous environmental risk <i>Thomas D. Crocker and Jason F. Shogren</i>	215
15	Standards versus taxes in pollution control <i>Gloria E. Helfand</i>	223
16	Imperfect markets, technological innovation and environmental policy instruments <i>Carlo Carraro</i>	235
17	Environmental policy and transactions costs <i>Kerry Krutilla</i>	249
18	Tradable permits in economic theory <i>Paul Koutstaal</i>	265
19	Lessons from using transferable permits to control air pollution in the United States <i>Tom Tietenberg</i>	275
20	The double dividend of an environmental tax reform <i>Ruud A. de Mooij</i>	293
21	Practical considerations and comparison of instruments of environmental policy <i>Clifford S. Russell and Philip T. Powell</i>	307
22	Public economics and environmental policy <i>Stef Proost</i>	329
23	Explaining instrument choice in environmental policies <i>Frank J. Dietz and Herman R.J. Vollebergh</i>	339
24	Equity in environmental policy with an application to global warming <i>Adam Rose and Snorre Kverndokk</i>	352
25	Distributional issues: an overview <i>Joan Martínez-Alier and Martin O'Connor</i>	380

PART IV INTERNATIONAL ASPECTS OF ENVIRONMENTAL ECONOMICS AND POLICY

26	Environmental policy in open economies <i>Michael Rauscher</i>	395
27	Partial equilibrium models of trade and the environment <i>Kerry Krutilla</i>	404
28	General models of environmental policy and foreign trade <i>Karl W. Steininger</i>	416

29	Strategic environmental policy and foreign trade <i>Alistair M. Ulph</i>	433
30	Environment, international trade and development <i>Harmen Verbruggen</i>	449
31	Environmental conflict, bargaining and cooperation <i>Carlo Carraro</i>	461
32	Transboundary environmental problems <i>Michael Hoel</i>	472
33	Economic analysis of global environmental issues: global warming, stratospheric ozone and biodiversity <i>David Pearce</i>	488
34	Tax instruments for curbing CO <sub>2</sub> emissions <i>Stephen Smith</i>	505

## PART V SPACE IN ENVIRONMENTAL ECONOMICS

35	Environment and regional economics <i>Peter Nijkamp</i>	525
36	Non-point source pollution control <i>Anastasios Xepapadeas</i>	539
37	Land use and environmental quality <i>William B. Meyer</i>	551
38	Urban sustainability <i>David Banister</i>	560
39	Location choice, environmental quality and public policy <i>James R. Markusen</i>	569
40	Transport and the environment <i>Kenneth J. Button and Piet Rietveld</i>	581

## PART VI ENVIRONMENTAL MACROECONOMICS

41	Environment in macroeconomic modelling <i>Ekko C. van Ierland</i>	593
42	Endogenous growth theory and the environment <i>Sjak Smulders</i>	610
43	A pro-growth perspective <i>Wilfred Beckerman</i>	622
44	Steady-state economics: avoiding uneconomic growth <i>Herman E. Daly</i>	635
45	An assessment of the growth debate <i>Jeroen C.J.M. van den Bergh and Ruud A. de Mooij</i>	643

46	The environmental Kuznets curve hypothesis <i>Sander M. de Bruyn and Roebijn J. Heintz</i>	656
47	Growth-oriented economic policies and their environmental impacts <i>Mohan Munasinghe</i>	678
48	The biophysical basis of environmental sustainability <i>Robert Goodland</i>	709
49	Indicators of sustainable development <i>Onno J. Kuik and Alison J. Gilbert</i>	722
50	Development, poverty and environment <i>Edward B. Barbier</i>	731

## PART VII ECONOMIC VALUATION AND EVALUATION

51	Theory of economic valuation of environmental goods and services <i>Per-Olov Johansson</i>	747
52	Recreation demand models for environmental valuation <i>Catherine L. Kling and John R. Crooker</i>	755
53	Hedonic models <i>Raymond B. Palmquist</i>	765
54	Contingent valuation <i>Bengt Kriström</i>	777
55	Meta-analysis, economic valuation and environmental economics <i>Jeroen C.J.M. van den Bergh and Kenneth J. Button</i>	796
56	Valuation and ethics in environmental economics <i>Russell K. Blamey and Mick S. Common</i>	809
57	Cost-benefit analysis of environmental policy and management <i>Nick Hanley</i>	824
58	Multi-criteria methods for quantitative, qualitative and fuzzy evaluation problems <i>Ron Janssen and Giuseppe Munda</i>	837

## PART VIII INTERDISCIPLINARY ISSUES

59	Physical principles and environmental economic analysis <i>Matthias Ruth</i>	855
60	Materials, economics and the environment <i>Robert U. Ayres</i>	867

61	Ecological principles and environmental economic analysis <i>Carl Folke</i>	895
62	Industrial metabolism and the grand nutrient cycles <i>Robert U. Ayres</i>	912
63	Indicators of economic and ecological health <i>Bruce Hannon</i>	946
64	EMERGY, value, ecology and economics <i>Robert A. Herendeen</i>	954
65	Evolution, environment and economics <i>John M. Gowdy</i>	965
66	Ethical perspectives and environmental policy analysis <i>Harold Glasser</i>	981
67	Environmental and ecological economics perspectives <i>R. Kerry Turner</i>	1001

#### PART IX METHODS AND MODELS IN ENVIRONMENTAL AND RESOURCE ECONOMICS

68	Input-output analysis, technology and the environment <i>Faye Duchin and Albert E. Steenge</i>	1037
69	Computable general equilibrium models for environmental economics and policy analysis <i>Klaus Conrad</i>	1060
70	Game theory in environmental policy analysis <i>Henk Folmer and Aart de Zeeuw</i>	1089
71	Optimal control theory in environmental economics <i>Talitha Feenstra, Herman Cesar and Peter Kort</i>	1099
72	Economic models of sustainable development <i>Jeroen C.J.M. van den Bergh and Marjan W. Hofkes</i>	1108
73	Energy-economy-environment models <i>Sylvie Faucheux and François Levarlet</i>	1123
74	Decomposition methodology in energy demand and environmental analysis <i>Beng Wah Ang</i>	1146
75	Input-output structural decomposition analysis of energy and the environment <i>Adam Rose</i>	1164
76	Experiments in environmental economics <i>Jason F. Shogren and Terrance M. Hurley</i>	1180
77	Natural resource accounting <i>Salah El Serafy</i>	1191

PART X PROSPECTS

78	Impacts of economic theories on environmental economics <i>Domenico Siniscalco</i>	1209
79	Integration and communication between environmental economics and other disciplines <i>John L.R. Proops</i>	1230
	<i>Name index</i>	1243
	<i>Subject index</i>	1265