IMAGE:
AN INTEGRATED MODEL TO ASSESS THE GREENHOUSE EFFECT

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by

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Contents

Preface xi

Units xii

1 General Introduction 1
- 1.1 The Problem . . . 1
- 1.2 The Model . . . 4

2 General Model description of IMAGE 11
- 2.1 Introduction . . . 11
- 2.2 Description of the Various Modules . . . 15
  - 2.2.1 Emission Modules . . . 15
  - 2.2.2 Concentration Modules . . . 16
  - 2.2.3 Climate Module . . . 17
  - 2.2.4 Sea Level Rise Module . . . 18
  - 2.2.5 Socio-Economic Impact Module . . . 19
- 2.3 Description of Scenarios . . . 19
  - 2.3.1 Introduction . . . 19
  - 2.3.2 Energy Supply . . . 20
  - 2.3.3 Agriculture . . . 24
  - 2.3.4 CFC Use . . . 26
  - 2.3.5 Other Trends . . . 27
- 2.4 Model Deficiencies and Future Developments . . . 27
- 2.5 Comparison with Other Models . . . 28
- 2.6 Discussion . . . 29

3 The Carbon Cycle Model 31
- 3.1 Introduction . . . 31
- 3.2 Model Description . . . 32

3.3 Emissions Module 32
3.4 Atmospheric Concentrations Module 34
3.5 Ocean Module 35
3.6 Terrestrial Biosphere Module 40
3.7 Deforestation Module 45
3.7.1 Introduction 45
3.7.2 Description of the Deforestation Model 47
3.7.3 Description of the Processes 53
3.8 Validation and Uncertainty 62
3.9 Results 62
3.10 Conclusions 72
3.11 Appendix 74

4 The Methane Module 81
4.1 Introduction 81
4.2 Model Description 82
4.2.1 Structure 82
4.2.2 Calculation Procedure 82
4.2.3 Notation 84
4.3 Emissions 84
4.4 Concentrations 90
4.5 Results 93
4.6 Conclusions 100

5 The N_2O Module 103
5.1 Introduction 103
5.2 N_2O Emissions Module 103
5.3 N_2O Concentration Module 106
5.4 Results 107
5.5 Conclusions 108

6 The CFCs Module 111
6.1 Introduction 111
6.2 CFCs Emissions Module 112
6.3 CFCs Concentrations Module 116
6.4 Results 117
6.5 Conclusions 121

7 The Climate Module **123**
7.1 Introduction 123
7.2 Model Description 125
7.2.1 Equilibrium Response 125
7.2.2 Transient Response 129
7.2.3 Climate Feedbacks 133
7.3 Results 134
7.4 Conclusions 146

8 The Sea Level Rise Module **149**
8.1 Basic Trend 150
8.2 Thermal Expansion 150
8.3 Glaciers and Small Ice Caps 151
8.4 Greenland Ice Cap 152
8.5 Antarctic Ice Cap 154
8.6 Uncertainties 155
8.7 Sea Level Rise Potential 156
8.8 Results 157
8.9 Conclusion 161

9 Socio-Economic Impact **163**
9.1 Introduction 163
9.2 General Model Description 164
9.3 Quantification of Impacts for Various Sectors 171
9.3.1 Introduction 171
9.3.2 Coastal Defence 171
9.3.3 Water Management and Water Supply 178
9.3.4 Agriculture 180
9.3.5 Energy Use 181
9.4 Results 182
9.5 Conclusions 191

10 Policy Analysis **193**
10.1 Introduction 193
10.2 Scenario Calculations 194
10.3 Low Climate Risk Scenario 195
10.4 Results 196
10.5 Delayed Response 198
10.6 Future Worlds 200

10.7 Conclusions 203

11 Temperature Increasing Potential **205**
11.1 Introduction 205
11.2 Relation between Temperature and Emissions 205
11.3 Methodology 206
11.3.1 Definition 206
11.3.2 Modelling Approach 208
11.3.3 Analytical Approach 211
11.4 Results 215
11.5 Conclusions 220
11.6 Appendix 222

12 Sensitivity Analysis **225**
12.1 Introduction 225
12.2 Metamodelling 226
12.3 Experimental Design 228
12.4 A Metamodel for the Costs of Dike Raising 230
12.4.1 Introduction 230
12.4.2 Input and output variables 230
12.4.3 Specification of the First Metamodel for the Costs of Dike Raising 230
12.4.4 Experimental Design for the First Metamodel 232
12.4.5 Results of the First Metamodel 233
12.4.6 Further Analysis after the First Metamodel 233
12.4.7 Specification of the Final Metamodel for the Costs of Dike Raising 234
12.4.8 Validation of the Final Metamodel 236
12.4.9 Scaling Effects 239
12.4.10 Conclusions 240
12.5 A Metamodel for the Ocean Module 241
12.5.1 Introduction 241
12.5.2 First Metamodel for the Ocean Module 242
12.5.3 Further Analysis after the First Metamodel 245
12.5.4 Final Metamodel for the Ocean Module 245
12.5.5 Conclusions 249
12.6 A Terrestrial Biosphere Metamodel 249
12.6.1 Introduction 249

12.6.2 Various Metamodels for the Terrestrial Biosphere Module 250
12.6.3 Conclusions 256
12.7 General Conclusions 257

13 Discussion **259**

References **263**

Preface

This book is the result of a research project entitled "Reference function for Global Air Pollution/CO_2" initiated by RIVM. It deals with the description of a computer simulation model of the greenhouse effect. This model, IMAGE, tries to capture the fundamentals of the complex problem of climate change in a simplified way. The model is a multidisciplinary product and is based on knowledge from disciplines as economics, atmospheric chemistry, marine and terrestrial biogeochemistry, ecology, climatology, and glaciology. This book might be of interest for any one working in the broad field of climate change. Furthermore, it can be useful for model builders, simulation experts, mathematicians etc. A PC version of the model will become available free of charge. Requests can be sent to the author.

Although being the only author of this book, I could never have written it without the help of many other people. First of all I would like to thank Koos Vrieze, originally a colleague at RIVM, later my professor. Without his inspiring attitude I would have never finished this thesis. I am also very grateful to RIVM for giving me the opportunity to write this thesis. I owe many thanks to Hans de Boois and Rob Swart for their support and assistance during the research. Furthermore, I would like to thank my trainees who have substantially contributed to the contents of this book. Especially I would like to thank Greet van Ham, who helped me to perform a thorough sensitivity analysis with the computer model. I also want to express my attitude for the help of Michel den Elzen, who assisted me with great devotion in developing and improving parts of the model. Special thanks to Martin Middelburg and André Berends for drawing the great number of pictures. I also wish to thank Marlies Haenen for the many hours she spent on transforming the rough version of the document into a perfect-looking one.

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Units

^oC	degrees Celsius
K	degrees Kelvin
ppm	parts per million by volume
ppb	parts per billion by volume
ppt	parts per trillion by volume
Gt	gigatons (10^{15} gram)
GtC	gigatons of carbon
Tg	teragram (10^{12} gram)
Mkg	million kilogram (10^9 gram)
λ	lambda
Wm^{-2}	watts per meter square
Mha	millions of hectares
kg	kilogram
TgN	teragram of nitrogen
Dfl	Dutch florins or guilders
km	kilometer