

Estimating Global Co Emission Constraints And Energy

This comprehensive volume is the first to consider biomass burning as a global phenomenon and to assess its impact on the atmosphere, on climate, and on the biosphere itself.

Plant-driven volatile organic compound (BVOC) emissions play a major role in atmospheric chemistry, including ozone and photochemical smog formation in the troposphere, and they extend the atmospheric lifetime of the key greenhouse gas, methane. Furthermore, condensation of photo-oxidation products of BVOCs leads to formation of secondary organic aerosols with profound implications for the earth's solar radiation budget and climate. Trees represent the plant life form that most contributes to BVOC emissions, which gives global forests a unique role in regulating atmospheric chemistry. Written by leading experts in the field, the focus is on recent advancements in understanding the controls on plant-driven BVOC emissions, including efforts to quantitatively predict emissions using computer models, particularly on elicitation of emissions under biotic and abiotic stresses, molecular mechanisms of volatile synthesis and emission and the role of emissions in plant stress tolerance.

Atmospheric Chemistry has been a rapidly growing field with a recent focus on the major aspects of global environmental change, including stratospheric ozone depletion, UV-B change, and global warming. This book describes recent developments in our

understanding of the global aspects of the chemistry in the main parts of the atmosphere, troposphere, and stratosphere, as obtained from field observations, laboratory investigations, and modeling studies. Although this chemistry is largely driven by reactions between gas phase species, recent progress made in the understanding of chemical reactions occurring in clouds and on the surface of aerosols is also reported.

This book is the result of a research project entitled "Reference function for Global Air Pollution/CO₂" 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 anyone 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 Vriese, 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.

Public and media interest in the climate change issue has increased exponentially in recent years. Climate change, or "global warming," is a complex problem with far-reaching social and economic impacts. *Climate Change in the 21st Century* brings together all the major aspects of global warming to give a state of the art description of our collective understanding of this phenomenon and what can be done to counteract it on both the local and global scale. Stewart Cohen and Melissa Waddell explain and clarify the different ways of approaching the study of climate change and the fundamental ideas behind them. From a history of climate change research to current attempts to mitigate its impact such as the Kyoto Protocol and carbon trading, they explore key ideas from many fields of study, outlining the environmental and human dimensions of global warming. *Climate Change in the 21st Century* goes beyond climate modeling to investigate interdisciplinary attempts to measure and forecast the complex impacts of future climate change on communities, how we assess their vulnerability, and how we plan to adapt our society. The book explores the impact of climate change on different ecosystems as well as what the social and economic understanding of this phenomenon can tell us; it also links discussions of climate change with the global discourse of sustainable development. *Climate Change in the*

21st Century provides a comprehensive, understandable, but academically informed introduction to the world's biggest challenge for both students and concerned citizens. The electric power sector is what keeps modern economies going, and historically, fossil fuels provided the bulk of the energy need to generate electricity, with coal a dominant player in many parts of the world. Now with growing concerns about global climate change, this historical dependence on fossil-fuels, especially those rich in carbon, are being questioned. Examining the implications of the industry's future in a carbon-constrained world, a distinct reality, is the subject of this book. Containing contributions from renowned scholars and academics from around the world, this book explores the various energy production options available to power companies in a carbon-constrained world. The three part treatment starts with a clear and rigorous exposition of the short term options including Clean Coal and Carbon Capture and Sequestration Technology, Coal, and Emission trading. Renewable energy options such as Nuclear Energy, Wind power, Solar power, Hydro-electric, and Geothermal energy are clearly explained along with their trade-offs and uncertainties inherent in evaluating and choosing different energy options and provides a framework for assessing policy solutions. This is followed by self-contained chapters of case-studies from all over the world. Other topics discussed in the book are Creating markets for tradable permits in the emerging carbon era, Global Action on Climate Change, The Impossibility of Staunching World CO₂ Emissions and Energy efficiency. Clearly

explains short term and long term options Contributions from renowned scholars and academics from around the world Case-studies from all over the world
The UN Environment Emissions Gap Report assesses the latest scientific studies on current and estimated future greenhouse gas emissions and compares these with the emission levels permissible for the world to progress on a least-cost pathway to achieve the goals of the Paris Agreement. This difference between “where we are likely to be and where we need to be” is known as the ‘emissions gap’. The report explores some of the most important options available for countries to bridge the gap.

Based on analysis of the Manchester city-region, this book offers a vision of a sustainable urban future, through integrated strategic management of the entire city-region. It translates principles into practice for achieving the necessary balance to ensure a higher standard of living and safe environment. The text presents: a 25-year horizon for the evolution and restructuring of the urban system; a focus for linkages and synergies between economic, social and environmental sectors; technical scenarios for land use, energy and material flows; spatial scenarios for each area and settlement type; and lateral thinking on cultural, information, localization and globalization trends. Also included are practical actions, methods and tools such as sustainability indicators and

appraisals that can be applied anywhere in the western world.

For at least a decade the science of climate change has warned us of the dire need for action – particularly by corporations who are the main engines of economic production and consumption. Yet managerial and corporate understanding of climate change and related energy issues remains fragmented and present actions lack the urgency this critical problem deserves. There is a whole new economy – the low-carbon economy – looming on the horizon. But our consumption and production patterns remain in a carbon-locked position. What we are risking is a global carbon crisis and a case of history repeating.

Humankind's failure to adequately recognise the onset of and address the effects of the global financial crisis mirrors our similar failures with the carbon crisis.

There are many parallels: both are and were predictable and both will have direct implications on humanity on a sweeping, indiscriminate and severe scale. The difference is that we cannot reverse the effects of climate change and fossil fuel scarcity as easily as we can repair the global financial system. It is of paramount importance that we wake up to the risks and begin tackling the issues early enough. To successfully address the risks, business needs to be aware of the consequences that a changing climate and finite carbon resources will have on their business performance. The element carbon – both as a resource and as an

emission – is both an economic threat as well as an opportunity for companies. It is a threat for carbon-intensive production systems that will need to be changed to avoid further harmful climatic change, and take into account the limited availability of carbon-based fuels. At the same time, new opportunities will emerge for companies who can creatively design and produce goods and services that fit the new emerging carbon-constrained business environment. Many sectors of the economy – for example, renewable energy, energy and resources conservation, waste reduction and management, carbon finance markets – will expand rapidly, as other carbon- and resource-intensive sectors decline. The Global Carbon Crisis succinctly translates important insights from the natural sciences, economics and equity discussions, for the business reader. It reviews important aspects of these discussions and clarifies misunderstandings with respect to climate change and fossil fuel availability and their implications for business. The book provides simple, direct, pragmatic and effective solutions that policy-makers and corporate managers can implement. The aim is to provoke action – thoughtful action – towards developing a low-carbon future for companies on three levels. At the macro level, the authors discuss the importance of tough industrial policies for climate change and propose the idea of an international carbon-equal fund. At the meso level, they elaborate on the role

of inter-firm collaborations for establishing low-carbon industries and production systems. At the micro level, they illustrate the virtue of proactive carbon strategies and suggest a corporate carbon management framework. Getting the message of the carbon crisis across to a business audience has proved challenging. This book successfully makes the case that they are intricately connected to one another and practising managers and business students will benefit from viewing the carbon crisis in parallel to the financial meltdown. The book will be essential reading for all businesses grappling with carbon-related issues and for many in academia, including those in management, strategy, finance, corporate social responsibility and sustainable development, globalisation and innovation studies.

International concern for the continued growth of greenhouse gas emissions, and the potentially damaging consequences of resultant global climate change, led to the signing of the United Nations Framework Convention on Climate Change by 155 nations at the Earth Summit in June 1992. The Convention came into force on 21 March 1994, three months after receiving its 50th ratification. All Parties to the Convention are required to compile, periodically update, and publish national inventories of anthropogenic greenhouse gas emissions and sinks using comparable methodologies. In support of this process, the US Country Studies

Program (US CSP) is providing financial and technical assistance to 56 developing and transition countries for conducting national inventories. This book presents the results of preliminary national inventories prepared by countries participating in the US CSP that are ready to share their interim findings. In some cases, inventories were prepared with support from other organizations. Preliminary inventories of twenty countries in Africa, Asia, Central and Eastern Europe and the Newly Independent States, and Latin America are presented, as well as regional and global syntheses of the national results. The regional and global syntheses also discuss results of eleven other preliminary national inventories that have been published elsewhere with the assistance of other programs. Results are discussed in the context of national and regional socioeconomic characteristics, and the regional and global syntheses compare national inventory estimates to other published estimates that are based largely on international databases. Papers also discuss inventory development issues, such as data collection and emission factor determination, and problems associated with applying the IPCC inventory methodologies. The preliminary inventory results reported here represent significant progress towards meeting country commitments under the Framework Convention, and provide useful information for refining international greenhouse gas emission databases and

improving inventory methodologies. As the first book to compile national greenhouse gas emission estimates prepared by national experts in developing countries and countries with economies in transition, this will be an invaluable resource to scientists, policymakers, and development specialists in national, regional and global anthropogenic sources and sinks of greenhouse gases. The Intergovernmental Panel on Climate Change (IPCC) was set up jointly by UNEP and the World Meteorological Organisation in 1988 to provide periodic scientific analysis of the causes, impacts and possible policy response options to climate change issues. This synthesis report is the 4th and final part of the IPCC's third assessment report, and contains information on nine policy-relevant questions regarding the IPCC's 2001 assessment. It is intended to assist governments, individually and collectively, to formulate appropriate adaptation and mitigation responses to the threat of human-induced climate change. This book grows out of a 2001 workshop on "Emission of Chemical Species and Aerosols into the Atmosphere." The contents deal with inventories of emissions related to anthropogenic emissions or biomass burning; emissions from vegetation and soils; emissions of mineral and sea-salt aerosols; and emissions of sulphur compounds from the oceans. Concluding chapters show how atmospheric observations have been used to improve our knowledge of

emissions.

Growing populations and economies have increased the public's awareness that the world's environmental resources are finite. The issues of global warming and the depletion of the ozone layer have given universal significance to what were once local and regional pollution problems. What is evident from *Public Economics and the Environment in an Imperfect World* is that Coasian negotiations fail to internalize the costs of environmental degradation, often calling for public intervention through the market mechanism. In its consideration of such issues the book includes contributions on assessment problems, institutional aspects, the need for coordination and efficiency, and distribution issues.

"Energy is indispensable in present society. All depend on a constant and reliable source of energy, whether it be for transport, industrial or home applications. The use of such energy sources can present some inconveniences, such as source depletion, pol"

A concise and authoritative guide to the evolution, terms and implications of the Kyoto Protocol, this book provides an economic and political account of key policy debates and their outcome. It also explains the meaning of provisions on emissions trading and other flexibility mechanisms, and provides a quantitative

analysis using the emissions trading model devised by the RIIA's Energy and Environmental Programme.

Rice production is affected by changing climate conditions and has the dual role of contributing to global warming through emissions of the greenhouse gas methane. Climate change has been recognized as a major threat to the global environment. Because of insufficient field data, rice-growing countries face a problem when trying to comply with the United Nations Framework Convention on Climate Change stipulations to compile a national inventory of emissions and to explore mitigation options. Given the expected doubling in rice production in Asia, the need to evaluate the interaction between climate change and rice production is critical to forming a sound basis for future directions of technology developments by policy makers, agriculturists, environmentalists, rice producers, and rice consumers. The present book comprises two sections. The first part documents a comprehensive overview of the results achieved from an interregional research effort to quantify methane emission from major rice ecosystems and to identify efficient mitigation options. This research report broadens understanding of the contribution of rice cultivation to methane emissions and clarifies that emissions are relatively low, except in specific rice ecosystems, and that these high emissions could be ameliorated without

sacrificing yield. The second section shows results from other projects that investigated the role of rice cultivators in field and laboratory approaches. The findings represent inputs for future modeling approaches in the role of rice cultivators. The expanded database generated by other projects is reflected in modeling efforts.

Generating Electricity in a Carbon-Constrained World Academic Press

The savannas of northern Australia are the most fire-prone part of a fire-prone continent. The savanna region comprises a third of the Australian landmass, of which roughly 20% is burned on average each year. Savanna fires currently contribute about 72% of national fire extent annually, the remainder comprising 26% from fires in central Australia and just 2% in the relatively densely populated southern Australia.

To achieve goals for climate and economic growth, "negative emissions technologies" (NETs) that remove and sequester carbon dioxide from the air will need to play a significant role in mitigating climate change. Unlike carbon capture and storage technologies that remove carbon dioxide emissions directly from large point sources such as coal power plants, NETs remove carbon dioxide directly from the atmosphere or enhance natural carbon sinks. Storing the carbon dioxide from NETs has the same impact on the atmosphere and climate as simultaneously preventing an equal amount

of carbon dioxide from being emitted. Recent analyses found that deploying NETs may be less expensive and less disruptive than reducing some emissions, such as a substantial portion of agricultural and land-use emissions and some transportation emissions. In 2015, the National Academies published *Climate Intervention: Carbon Dioxide Removal and Reliable Sequestration*, which described and initially assessed NETs and sequestration technologies. This report acknowledged the relative paucity of research on NETs and recommended development of a research agenda that covers all aspects of NETs from fundamental science to full-scale deployment. To address this need, *Negative Emissions Technologies and Reliable Sequestration: A Research Agenda* assesses the benefits, risks, and "sustainable scale potential" for NETs and sequestration. This report also defines the essential components of a research and development program, including its estimated costs and potential impact.

The development and analysis of climate policy proposals intertwine with the structure of knowledge and the possibility for changing it. Key questions concern the long-term interaction between policy, technology, infrastructure, and the earth system, but each of these components is deeply uncertain. This dissertation advances the description of knowledge about the climate system, the assessment of economic responses to climatic possibilities, and the development of policy that positions society to achieve long-term climate goals. It offers new paths to describing understanding of complex systems and to modeling optimal management under structural uncertainty. The first

chapter formalizes uncertainty about equilibrium climate change. Its hierarchical Bayes framework allows climate models to be incomplete and to share biases, and it shows how prior beliefs about models' completeness and independence interact with models' estimates of feedback strength to determine distributions for temperature change. When models might share biases, the results of additional models might tell us more about models' common structure than about the real-world processes they aim to represent. The most valuable information would then come not from related models but from alternate estimates that should carry a different set of unobservable biases. The possibility that models are wrong in common ways limits the degree to which models' estimates can narrow the probability distribution for feedback strength, which also limits our ability to rule out extreme climatic outcomes. The second chapter empirically estimates a feedback that is especially difficult to model. Climate-carbon feedbacks (or carbon cycle feedbacks) describe the effect of temperature on carbon dioxide (CO₂). If they are positive, then not only does anthropogenic CO₂ cause warming via the greenhouse effect and earth system feedbacks, but this warming itself increases CO₂ and so causes further warming. Previous empirical work estimated a stronger feedback than did coupled climate-carbon cycle models. However, those empirical estimates were probably biased upwards while coupled models' estimates were primarily driven by a few ill-constrained parameters. This chapter attempts to obtain an unbiased estimate of climate-carbon feedback strength by using variations in summer radiation in

the Arctic (i.e., variations in orbital forcing) to identify the effect of temperature on CO₂ in 800 ky ice core records. It finds a range for climate-carbon feedbacks that is closer to coupled models' estimates than to previous empirical work. Since climate-carbon feedbacks are probably positive, temperature change projections tend to underestimate an emission path's consequences if they do not allow the carbon cycle to respond to changing temperatures. The next three chapters assess economic responses to climate change in a policy-optimizing integrated assessment model, in games with long-lived investments into abatement capital, and in a cost-effectiveness model with multiple policy options stretching over long time horizons. The first of these chapters extends a well-known integrated assessment model to include the possibility of abrupt shifts in the climate system. It also changes the model's structure to make the decision-maker aware of uncertainty and of the possibility for learning over time, and it generalizes the welfare evaluation to reflect that uncertainty about temperature change is qualitatively unlike uncertainty about climate thresholds. It finds that tipping points can increase the near-term social cost of carbon by more than 50% when they raise climate sensitivity or make damages more convex. They have less of an effect when they increase the atmospheric lifetime of CO₂ or the quantity of non-CO₂ greenhouse gases. Allowing the policymaker to be differentially averse to consumption fluctuations over time and over risk increases the near-term social cost of carbon by 150%, with tipping point possibilities then increasing it by another 50%. The possibility of tipping points is more

important for the social cost of carbon than is the ambiguity attitude the decision-maker uses in evaluating them. The second of these climate economics chapters models the optimal emission tax when firms can adopt low-pollution technology that reduces abatement cost. The regulator anticipates this adoption but must set the tax before firms invest. In many cases, a linear emission tax cannot obtain both socially optimal investment and socially optimal emissions because the regulator either will set it inefficiently high to stimulate investment or will set it at an ex post optimal level that obtains inefficiently low investment. The difficulty is that an emission tax fixes both the incentive to invest and the incentive to abate, but these two goals rarely align perfectly when investment is lumpy. In contrast, tradable permits policies do not suffer this tension because the permit price responds automatically to realized investment. A numerical model then considers the ability of the regulator to select not only the level but also the duration of the tax. It shows that outcomes are still often socially inefficient. Further, the regulator will occasionally use a longer tax to obtain investment when firms expect their investments to lower the tax in the next period, but the cost of not being able to adjust the next period's tax limits the parameter space in which the longer tax is employed. The fifth chapter constructs cost-effective dynamic policy portfolios of abatement, research and development (R & D), and negative emission technology deployment in order to achieve 21st century climate targets. It includes two types of stochastic technological change in a stylized numerical model and allows each type of

technology to respond both to public R & D and to abatement policies. It compares worlds where negative emission technologies are and are not available, and it compares a world where the century's cumulative net emissions are constrained with a world in which threshold possibilities lead policy to constrain cumulative net emissions in each year during the century. It finds that R & D options are valuable and exercised but do not substitute for near-term abatement. The type of R & D undertaken depends on long-term emission goals because those determine the magnitude of future abatement. When the cumulative emission constraint is stringent, negative emission technologies substitute for near-term abatement and affect the type of R & D undertaken, but if threshold considerations eliminate the freedom to temporarily overshoot emission targets, negative emission technologies become less valuable. The availability of negative emission technologies provides a valuable option to partially undo previous emissions, but abatement also gains option value from increasing future flexibility to forgo reliance on negative emission technologies if the technology or climate prove problematic in the interim. The concluding chapter directly connects uncertainty about climate change to uncertainty about the cost of achieving CO₂ targets. It shows how beliefs about technology, temperature, and damages interact to affect the cost-effectiveness of climate targets. It finds that the speed with which damages increase at higher temperatures is the most important of these factors. Both 450 parts per million (ppm) and 550 ppm CO₂ targets provide net benefits for quadratic

damage functions that reduce annual output by less than the 1-2% estimated for 2.5°C of warming. Cubic damage functions support both CO₂ targets even if 2.5°C of warming only reduces output by 0.2% or less. More convex damage functions also reduce the importance of abatement cost uncertainty. significantly increase the range of damage functions that support these targets and decrease the importance of abatement cost uncertainty. In addition, because extreme feedback outcomes have little effect over the next decades, a thinner-tailed temperature distribution (resulting from optimistic prior beliefs about climate models' independence and biases) supports CO₂ targets under slightly less severe damages than does the thicker-tailed distribution (resulting from skepticism about climate models' independence and biases). Emission reductions hedge against greater societal sensitivity to temperature increases while exposing society to the upside of positive technology surprises. The epistemology of complex systems in an out-of-sample world is a key motif. This dissertation advances knowledge of climate change and understanding of policy design in settings with limited ability to predict future changes or responses. Further work should seek a more unified framework for describing and acting on knowledge of evolving complex systems. Global Biomass Burning provides a convenient and current reference on such topics as the remote sensing of biomass burning from space, the geographical distribution of burning; the combustion products of burning in tropical, temperate, and boreal ecosystems; burning as a global source of atmospheric gases and particulates; the

impact of biomass burning gases and particulates on global climate; and the role of biomass burning on biodiversity and past global extinctions."--Pub. desc.

This is an interim report of the ad hoc Committee on Air Emissions from Animal Feeding Operations of the National Research Council's Committee on Animal Nutrition. A final report is expected to be issued by the end of 2002. The interim report is intended to provide the committee's findings to date on assessment of the scientific issues involved in estimating air emissions from individual animal feeding operations (swine, beef, dairy, and poultry) as related to current animal production systems and practices in the United States. The committee's final report will include an additional assessment within eight broad categories: industry size and structure, emission measurement methodology, mitigation technology and best management plans, short- and long-term research priorities, alternative approaches for estimating emissions, human health and environmental impacts, economic analyses, and other potential air emissions of concern. This interim report focuses on identifying the scientific criteria needed to ensure that estimates of air emission rates are accurate, the basis for these criteria in the scientific literature, and uncertainties associated with them. It also includes an assessment of the emission-estimating approaches in a recent U.S. Environmental Protection Agency (EPA) report Air Emissions from Animal Feeding Operations. Finally, it identifies economic criteria needed to assess emission mitigation techniques and best management practices.

The computer revolution both in the hardware as well as in software has made it possible for economists to analyze complex issues which could not be solved in the past by analytical methods. A large library of numerical techniques are now available to economists for solving models ranging from a simple system of linear simultaneous equations to large non-linear dynamic optimization models. We attempt to take advantage of these advancements in computational economics to address the issue of global warming and economic development. The use of computer simulation models has enhanced the understanding of some of the underlying issues in the global warming literature which would have been impossible without these models. However, to date, the global warming issue has been addressed in a partial equilibrium framework. In other words, the climate scientists tend to specify economic variables as exogenous variables in their global warming models while the economists do the same by specifying the climate variables as exogenous variables in their global warming models. Both approaches ignore important feedback relationships which will be triggered when either economic or climate variables are perturbed. The ideal model structure would be one in which both systems are incorporated within one framework with emphasis on the long run effects of greenhouse gas curbing policies and the corresponding effect on the economic growth potential of the economies. This book provides profiles of over 50 countries with 54 development indicators about people, environment, economy, technology, infrastructure, trade and finance, all in one

handy, pocket-sized volume. A must have for anyone interested in today's development challenges in sub-Saharan Africa.

Cepal Review is the leading journal for the study of economic and social development issues in Latin America and the Caribbean. Edited by the Economic Commission for Latin America, each issue focuses on economic trends, industrialization, income distribution, technological development and monetary systems, as well as the implementation of reforms and transfer of technology. Written in English and Spanish (Revista De La Cepal), each tri-annual issue brings you approximately 12 studies and essays undertaken by authoritative experts or gathered from conference proceedings.

The Department for Energy and Climate Change's (DECC) official CO₂ figures - that count territorial emissions from power stations and transport, etc, within UK borders - show nearly 20% reduction between 1990-2009. But research commissioned for the Department for the Environment Food and Rural Affairs reveals that CO₂ emissions were 20% higher in 2009 if consumption based emissions - from imported goods - are included. The fall in territorial emissions was not mainly the consequence of the Government's climate policy. Rather it was the result of the shift in manufacturing industries away from the UK and the switch from coal to gas-fired electricity generation that began in the early 1990s. Since 1990 carbon dioxide emissions from imports have almost doubled (from 166 million tonnes (Mt) CO₂ to 331 Mt CO₂ in 2009). If the UK wishes to encourage emissions reductions in countries that manufacture and export goods to the UK, the MPs say the Government should recognise the growth in the UK's consumption-based emissions. Acknowledging that UK consumption is driving up territorial emissions in other countries could increase the UK's leverage over those emissions

and help to secure a binding global agreement on carbon cuts. There is sufficiently robust data available to develop new policy options and identify carbon-intensive behaviours that are overlooked by concentrating on territorial emissions alone. Ministers should explore the options for incorporating consumption-based emissions data in to the policy making process and setting emissions targets on a consumption-basis at the national level.

"Mercury deposition and contamination is widespread and well documented, and it continues to be a public-health concern for certain sectors of the global human population in both developed and developing countries. This edited volume focuses on integrating the diverse sciences involved in the process of mercury cycling in the environment--from the atmosphere, through terrestrial and aquatic food webs, and human populations--to develop a comprehensive perspective on this important environmental pollutant. Using a systems-level approach, this book provides recommendations on mercury remediation, risk communication, education, and monitoring. In response to a growing need for understanding the cycling of this ubiquitous pollutant, the science of mercury has grown rapidly, expanding into several interdisciplinary fields and encompassing such disparate academic and scientific disciplines as biogeochemistry, economics, sociology, public health, decision sciences, physics, global change, and mathematics. Only recently have scientists really begun to establish more holistic approaches to studying mercury pollution, giving rise to investigations that have furthered the integration of a multi-tiered approach, especially by using chemistry, biology, and human health sciences collectively. The study of mercury pollution has produced a variety of contributions to domestic and international policies related to the management of mercury in the environment"--Provided by publisher.

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