

Cambridge University Press

978-1-107-00228-9 - Climate Policy Foundations: Science and Economics with Lessons from Monetary Regulation

William C. Whitesell

Frontmatter

[More information](#)

---

## CLIMATE POLICY FOUNDATIONS

This book provides a thorough grounding in the science and economics of climate policy issues and draws key lessons from the longer experiences of central banks in grappling with related challenges. Findings and controversies of climate history and the effects of human activities on climate are reviewed. The author describes similarities in risk management approaches for climate and monetary policy. Overall goals and frameworks for addressing climate change risks are assessed. Command-and-control and market-based options are compared (including performance standards, taxes, and cap-and-trade). Market-based approaches sometimes require a choice between prices and quantities as policy instruments. However, the author discusses how techniques of central bank interest rate management can be adapted in a hybrid climate policy approach to achieve environmental goals while making carbon prices predictable and ensuring well-functioning carbon markets. Key lessons are offered for improving existing and future national and international climate policy architectures.

William C. Whitesell is Director of Policy Research at the Center for Clean Air Policy in Washington, DC. From 1987 to 2006, he served on the staff of the U.S. Federal Reserve Board, where he held management responsibilities for staff work on the formulation and implementation of monetary policy, including market analysis and the monetary regulation of banks. He conducted independent climate economics research from 2006 to 2007.

Dr. Whitesell has also held positions as a financial analyst at the World Bank and as a development finance specialist at the Banque Arabe et Internationale d'Investissement, in addition to proprietary consulting. Earlier he taught economics at New York University and Virginia Tech. He holds an MBA from the Wharton School at the University of Pennsylvania and a Ph.D. in economics from New York University.

Cambridge University Press

978-1-107-00228-9 - Climate Policy Foundations: Science and Economics with Lessons from  
Monetary Regulation

William C. Whitesell

Frontmatter

[More information](#)

---

# Climate Policy Foundations

*Science and Economics with Lessons  
from Monetary Regulation*

WILLIAM C. WHITESELL



**CAMBRIDGE**  
UNIVERSITY PRESS

Cambridge University Press

978-1-107-00228-9 - Climate Policy Foundations: Science and Economics with Lessons from Monetary Regulation

William C. Whitesell

Frontmatter

[More information](#)

CAMBRIDGE UNIVERSITY PRESS

Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore,  
São Paulo, Delhi, Dubai, Tokyo, Mexico City

Cambridge University Press

32 Avenue of the Americas, New York, NY 10013-2473, USA

[www.cambridge.org](http://www.cambridge.org)

Information on this title: [www.cambridge.org/9781107002289](http://www.cambridge.org/9781107002289)

© William C. Whitesell 2011

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published 2011

Printed in the United States of America

*A catalog record for this publication is available from the British Library.*

*Library of Congress Cataloging in Publication data*

Whitesell, William C.

Climate policy foundations : science and economics with lessons from monetary regulation /

William C. Whitesell.

p. cm.

Includes bibliographical references and index.

ISBN 978-1-107-00228-9 (hardback)

1. Environmental policy – Economic aspects. 2. Climatic changes – Economic aspects. 3. Monetary policy – Environmental aspects. I. Title.

HC79.E5W486 2011

363.738'74–dc22 2010042840

ISBN 978-1-107-00228-9 Hardback

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party Internet Web sites referred to in this publication and does not guarantee that any content on such Web sites is, or will remain, accurate or appropriate.

Cambridge University Press

978-1-107-00228-9 - Climate Policy Foundations: Science and Economics with Lessons from  
Monetary Regulation

William C. Whitesell

Frontmatter

[More information](#)

---

*To Lee, Dale, Lily, Craig, and Bob*

Cambridge University Press

978-1-107-00228-9 - Climate Policy Foundations: Science and Economics with Lessons from Monetary Regulation

William C. Whitesell

Frontmatter

[More information](#)

## Contents

<i>List of Figures and Tables</i>	page viii
<i>Acknowledgments</i>	ix
Introduction	1
PART ONE EARTH'S CLIMATE HISTORY AND OUTLOOK	9
1. Salient Events of Climate History	11
2. Human and Climate Interactions	35
3. Greenhouse Gases	55
4. Emitting Economic Sectors	64
5. Forecasts of GHG Emissions and Global Temperatures	82
6. Potential Impacts of Climate Change	96
PART TWO CLIMATE POLICY CHOICES	111
7. Climate Policy Goals	113
8. Policy Mandates and Market-Based Instruments	135
9. The Design of Cap-and-Trade Programs	157
10. Prices, Quantities, and Lessons from Monetary Policy	178
11. The Outlook for Climate Policies	206
<i>Appendix: Discount Rates in Climate Analysis</i>	225
<i>References</i>	229
<i>Index</i>	241

Cambridge University Press

978-1-107-00228-9 - Climate Policy Foundations: Science and Economics with Lessons from Monetary Regulation

William C. Whitesell

Frontmatter

[More information](#)

## Figures and Tables

## FIGURES

2.1. Global average temperature estimates	<i>page</i> 44
2.2. Atmospheric CO <sub>2</sub> concentrations	49
2.3. World CO <sub>2</sub> emissions from fossil fuels	51
6.1. Relative global average sea level	98
7.1. Schematic of emission abatement in one year	119

## TABLES

4.1. Energy sources and end-use sectors (2004)	65
4.2. Estimates of total fossil fuel resources	67

Cambridge University Press

978-1-107-00228-9 - Climate Policy Foundations: Science and Economics with Lessons from  
Monetary Regulation

William C. Whitesell

Frontmatter

[More information](#)

---

## Acknowledgments

I am grateful for comments received from Douglas and Deborah Baker, Heidi Garrett, Donald Wharton, E. Donald Elliott, and anonymous reviewers.