

# CLIMATE CHANGE AND THE LAW

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# CLIMATE CHANGE AND THE LAW

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MATTHEW  BENDER

# *Dedication*

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To Sue, Zach, and Mats—C.W.

To Mark, with love—M.P.

To Margaret, Danielle, and Edward—D.H.



# Preface

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Climate change has become the defining environmental legal and policy challenge of the 21st century, as well as one of the most dynamic. If there is any doubt, consider just some of the events of the past eighteen months since we began writing this book. The Intergovernmental Panel on Climate Change (IPCC) issued its Fourth Assessment, concluding, with 90 percent certainty, that the observable increases in temperature are the result of human activities. The IPCC, along with Al Gore, shared the Nobel Peace Prize in 2007 “for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.” The United States Supreme Court ruled in *Massachusetts v. EPA* that the U.S. Environmental Protection Agency has authority under the Clean Air Act to regulate carbon dioxide. The United States Fish & Wildlife Service listed the polar bear as a threatened species under the Endangered Species Act principally because its habitat, the Arctic sea ice upon which it is almost entirely dependent, is melting due to increased temperatures and other factors. The Inupiat Village of Kivalina has sued ExxonMobil and other leading energy companies for the costs of relocating their village, which is subsiding into the ocean due to climate change. Due to the high demand for development of solar power in six western states, the Bureau of Land Management and Department of Energy put a moratorium on such projects until it could prepare a programmatic Environmental Impact Statement to assess the environmental, social, and economic impacts associated with solar energy development — and then lifted moratorium. At the international level, governments agreed to an action plan laying out the negotiating framework for concluding a climate change treaty by 2009 to follow the Kyoto Protocol in 2012.

Climate change will continue to occupy center stage as individuals and governments wrestle with mitigating their emissions and adapting to the impacts of climate change at a time when the gravity of climate change becomes increasingly apparent. Seemingly every day, scientists announce new studies showing that the impacts of climate change are more severe or occurring more rapidly than previously predicted. For example, Arctic sea ice is melting faster than predicted and sea levels have risen more than originally thought. Moreover, citizens and governments continue to press for change, using every legal tool at their disposal. Municipalities are developing climate-friendly building codes. States continue to enact renewable portfolio standards that require electricity producers to obtain a certain percentage of energy from renewable sources. Citizens have brought legal actions against major emitters of greenhouse gases for causing a public nuisance. In addition to such common law claims, citizens have also sued the federal government under the Clean Air Act, the Endangered Species, and the National Environmental Policy Act, as well as made petitions under the Clean Water Act, to compel the United States government to mitigate greenhouse gas emissions. At the international level, citizens have used international processes, such as the Inter-American Human Rights Commission and the World Heritage Convention, to compel governments to act more aggressively to mitigate greenhouse gas emissions or adapt to climate change impacts. And many businesses are voluntarily reducing their carbon footprints and trading for increasing amounts of carbon credits in both international and domestic carbon markets.

Given the all-encompassing reach of climate change, it presents both unique challenges and opportunities for teaching. The subject allows students to study how many different areas of law — public international law, public administrative law, federal environmental law, state and municipal regulations, and the common law — can be implicated in

## *Preface*

addressing such a major social issue. The subject thus allows for an integrated experience to study the law generally, as well as to understand in detail the many climate-related challenges facing the next generation of lawyers. To reflect the breadth of legal responses to climate change, this book takes a comprehensive approach to climate change and the law, covering everything from municipal building codes that incorporate climate-friendly requirements, to state efforts to reduce carbon dioxide emissions from automobiles and other sources of greenhouse gases, to federal litigation involving both the common law and statutory law, as well as to the international climate treaty regime. As such, this book could be used as a first-year introduction to the law, a capstone course, or simply as an issue-specific course.

The book is roughly organized in three parts. The first part of the book reviews the background scientific and policy issues surrounding climate change. Chapter 1 summarizes the scientific basis of climate change, relying principally on the IPCC's Fourth Assessment, but supplementing the IPCC's reports with the fast-growing scientific literature that is making the IPCC's 2007 Fourth Assessment seemingly already out of date. Chapter 2 describes the policies and measures that are or could be used to mitigate greenhouse gas emissions, as well as the economic costs of some of those strategies. Recognizing that climate change impacts will occur regardless of how quickly we act to mitigate greenhouse gas emissions, Chapter 3 explores adaptation strategies.

Part two delves deeply into the international framework of the climate change regime. Chapters 4 and 5 introduce the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and the subsequent 1997 Kyoto Protocol, which requires developed countries to reduce or limit their emissions of six greenhouse gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, sulphur hexafluoride, and perfluorocarbons. Subsequent chapters provide a detailed investigation of specific aspects of the international climate change regime. Chapter 6 explores the different types of emissions trading, collectively known as the flexibility mechanisms, under the Kyoto Protocol. Chapter 7 reviews the complicated and controversial regime for reducing greenhouse gas emissions through land use and forest management practices. Chapter 8 describes the Kyoto Protocol's compliance regime. Chapter 9 then explores development of the post-Kyoto Protocol regime, an issue of particular importance as countries struggle to meet their existing obligations under the Kyoto Protocol while scientists make clear that the Kyoto Protocol's commitments fall far short of the greenhouse gas emissions reductions necessary to avoid catastrophic climate change. Finally, Chapter 10 introduces other international laws affecting climate change. The Kyoto Protocol's climate change regime is not the only international law relevant for mitigating emissions and adapting to climate change. Thus, Chapter 10 describes policies affecting climate change within other international conventions, including the Montreal Protocol on Substances that Deplete the Ozone Layer, the World Heritage Convention, and the World Trade Organization, among others.

Part three then explores U.S. domestic law. Chapter 11 begins this part by reviewing general U.S. policy concerning climate change. Much of the action, however, has taken place in the courts, so Chapter 12 starts with a discussion of threshold issues, such as Constitutional standing, that determine whether a climate change litigant can even use the judicial system. Chapter 13 then discusses the role existing federal environmental statutes — the Clean Air Act, in particular — may play in mitigating climate change. Chapters 14 and 15 then look at how U.S. energy and transportation policies affect and intersect with climate change policies. Chapter 16 turns back to the courts to discuss the role of the common law in addressing climate change. As Chapters 11 through 16 reveal, the United States does not have a uniform or cohesive climate change policy. Indeed, in many



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situations, the U.S. government has refused to act and thus prompted state and local governments to adopt their own climate change laws and regulations. Chapter 17 reviews the most common and/or aggressive sub-federal actions and explores the roles that all levels of government should and legally can play in mitigating climate change. Chapter 18 looks at the role that private actors have take on their own to reduce greenhouse gas emissions. Finally, Chapter 19 attempts to peer into the future to discuss whether and how governments may move toward a low-carbon future.

### *Editor's Note*

Most footnotes and internal citations have been omitted without indication. Those footnotes that have been retained are numbered as they are in the original text. Deletions of text within an excerpt are indicated in two ways. Small deletions of a sentence or two are indicated with ellipses. The deletion of larger blocks of text is denoted with asterisks. Deletions of dissenting or concurring opinions are generally not noted.



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## *Abbreviations & Conversion Units*

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AA	Assigned Amount
AAU	Assigned Amount Unit
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CCX	Chicago Climate Exchange
CDM	Clean Development Mechanism
CER	Certified Emissions Reduction
CH <sub>4</sub>	Methane
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> eq	Carbon Dioxide Equivalent
CWA	Clean Water Act
EISA	Energy Independence and Security Act
ERU	Emission Reduction Unit
EPA	United States Environmental Protection Agency
EPAct	Energy Policy Act
ESA	Endangered Species Act
EU	European Union
GEF	Global Environment Facility
GHG	Greenhouse Gas
GWP	Global Warming Potential
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
ICERs	Long-term Certified Emission Reductions
MtCO <sub>2</sub> eq	Million Tons Equivalent of Carbon Dioxide
MW	Megawatt
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
N <sub>2</sub> O	Nitrous Oxide
PHEV	Plug-in Hybrid Electric Vehicles
RMU	Removal Unit
RFS	Renewable Fuel Standard
RPS	Renewable Portfolio Standard
SF <sub>6</sub>	Sulfur Hexafluoride
tCERs	Temporary Certified Emission Reductions
UNFCCC	United Nations Framework Convention on Climate Change
VMT	Vehicle Miles Traveled

**Conversion Units**

1 tonne (t)	1,000 kilogram (kg)	10 <sup>6</sup> gram (g)	1 Megagram (Mg)
1 Megatonne (Mt)*	1,000,000 t	10 <sup>12</sup> g	1 Teragram (Tg)
1 Gigatonne (Gt)	1,000,000,000 t	10 <sup>15</sup> g	1 Petagram (Pg)
1 hectare (ha)	10,000 square metre (m <sup>2</sup> )		
1 square kilometer (km <sup>2</sup> )	100 hectare (ha)		
1 tonne per hectare	100 gram per square metre (g m <sup>2</sup> )		
1 tonne carbon	3.67 tonne carbon dioxide (tCO <sub>2</sub> )		
1 tonne carbon dioxide	0.273 tonne carbon (t C)		
1 tonne	0.984 imperial ton = 1.10 US ton = 2,204 pounds		
1 hectare (ha)	2.471 acre		
1 square kilometer (km <sup>2</sup> )	0.386 square mile		

**Putting Emissions in Context**

**1 Metric Ton CO<sub>2</sub>.** Producing one ton of cement releases 1 metric ton CO<sub>2</sub> into the atmosphere (each new average home built uses 19 tons of cement). In Honolulu, the city with the lowest carbon footprint per capita in the U.S., each resident accounts for 1.5 metric tons CO<sub>2</sub> emissions per year.

**100 Tons CO<sub>2</sub>.** Driving an automobile with an average fuel economy of 15 miles per gallon 12,000 miles a year over the course of 10 years would emit close to 100 metric tons CO<sub>2</sub> (or, more precisely, 94.2 metric tons CO<sub>2</sub>).

**1,000 Metric Tons CO<sub>2</sub>.** The U.S. produces roughly 1,000 metric tons CO<sub>2</sub> every 5.4 seconds.

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\* Some authors quoted in this book use the abbreviation MMTCO<sub>2</sub> to refer to million metric tons of carbon dioxide. 1MMtCO<sub>2</sub> and 1MtCO<sub>2</sub> are equivalent.