The Harvard Project on International Climate Agreements is a global, multi-disciplinary effort intended to help identify the key design elements of a scientifically sound, economically rational, and politically pragmatic post-2012 international policy architecture for addressing the threat of climate change. It has commissioned leading scholars to examine a uniquely wide range of core issues that must be addressed if the world is to reach an effective agreement on a successor regime to the Kyoto Protocol. The purpose of the project is not to become an advocate for any single policy but to present the best possible information and analysis on the full range of options concerning mitigation, adaptation, technology, and finance. The main findings of the Harvard Project are reported in this accessible volume for policymakers, prepared by project leaders Joseph E. Aldy and Robert N. Stavins.

A companion volume with a more detailed account of the research is published separately as Post-Kyoto International Climate Policy: Implementing Architectures for Agreement.

Joseph E. Aldy is Fellow at Resources for the Future in Washington, DC. He also served on the staff of the President’s Council of Economic Advisers, where he was responsible for climate change policy from 1997 to 2000.

Robert N. Stavins is Albert Pratt Professor of Business and Government at the John F. Kennedy School of Government at Harvard University. He is also Director of the Harvard Environmental Economics Program and Chairman of the Kennedy School’s Environment and Natural Resources Faculty Group.
Post-Kyoto International Climate Policy

Summary for Policymakers

Joseph E. Aldy and Robert N. Stavins

Research from the Harvard Project on International Climate Agreements
To my inspiration, Sarah
J. E. A.

To my loving wife, Joanna
R. N. S.
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International Advisory Board
Harvard Environmental Economics Program

The Harvard Project on International Climate Agreements is an initiative of the Harvard Environmental Economics Program, which develops innovative answers to today’s complex environmental issues, through research, teaching, and policy outreach.

Carlo Carraro  
Professor of Environmental Economics  
University of Venice  

Fred Krupp  
President  
Environmental Defense Fund  

Eileen Claussen  
President  
Pew Center on Global Climate Change  

John Llewellyn  
Principal  
Llewellyn Consulting  

Fulvio Conti  
Chief Executive Officer and General Manager  
Enel SpA  

Frank E. Loy  
Former Under Secretary for Global Affairs  
United States Department of State  

Maureen Cropper  
Professor of Economics  
University of Maryland  

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Mondoil Corporation  

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Managing Director  
Booz and Company  

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President and Chief Executive Officer  
Vattenfall  

William K. Reilly  
President and Chief Executive Officer  
Aqua International Partners LP
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<td>Chairman, President, and Chief Executive Officer Duke Energy</td>
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<td>Richard L. Schmalensee</td>
<td>Howard W. Johnson Professor of Economics and Management MIT Sloan School of Management</td>
</tr>
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<td>President and Chief Executive Officer InterGen</td>
</tr>
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<td>Björn Stigson</td>
<td>President World Business Council for Sustainable Development</td>
</tr>
<tr>
<td>Cathleen Stone</td>
<td>Special Assistant for Environment to the Mayor of Boston, Massachusetts</td>
</tr>
<tr>
<td>Jorge Vasconcelos</td>
<td>Chairman New Energy Solutions First (NEWES)</td>
</tr>
<tr>
<td>Robert C. Weber</td>
<td>Chief Executive Officer ENSR</td>
</tr>
<tr>
<td>Timothy E. Wirth</td>
<td>President United Nations Foundation</td>
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Faculty Steering Committee
Harvard Project on International Climate Agreements

Graham Allison
Douglas Dillon Professor of Government
Harvard Kennedy School

Richard Peiser
Michael D. Spear Professor of Real Estate Development
Harvard Graduate School of Design

Jeffrey Frankel
James W. Harpel Professor of Capital Formation and Growth
Harvard Kennedy School

Forest Reinhardt
John D. Black Professor of Business Administration
Harvard Business School

Jerry Green
John Leverett Professor in the University Harvard Faculty of Arts and Sciences

Daniel Schrag
Professor of Earth and Planetary Sciences
Harvard Faculty of Arts and Sciences

James Hammitt
Professor of Economics and Decision Sciences
Harvard School of Public Health

Steven Shavell
Samuel R. Rosenthal Professor of Law and Economics
Harvard Law School

William Hogan
Raymond Plank Professor of Global Energy Policy
Harvard Kennedy School

Beth Simmons
Clarence Dillon Professor of International Affairs
Harvard Faculty of Arts and Sciences

Dale Jorgenson
Samuel W. Morris University Professor Harvard Faculty of Arts and Sciences

Robert Stavins
Albert Pratt Professor of Business and Government
Harvard Kennedy School

Robert Lawrence
Albert L. Williams Professor of International Trade and Investment
Harvard Kennedy School

Richard Vietor
Senator John Heinz Professor of Environmental Management
Harvard Business School
Management
Harvard Project on International Climate Agreements

Project Management

Robert Stavins
Director

Robert Stowe
Project Manager

Jason Chapman
Project Coordinator

Tyler Gumpright
Project Assistant

Susan Lynch
Webmaster

Matthew Ranson
Research Assistant
Contributors

Ramgopal Agarwala is a consultant to the World Bank and Asian Development Bank and a Distinguished Fellow at Research and Information System for Developing Countries in New Delhi. He has worked in various senior positions in the World Bank for 25 years, with his last posting to Beijing as the chief economist of the World Bank in China. His most recent research includes articles on international financial architecture and climate change.

Joseph E. Aldy is a Fellow at Resources for the Future. He served on the staff of the President’s Council of Economic Advisers from 1997 to 2000, where he was responsible for climate change policy. Dr. Aldy holds a PhD in economics from Harvard University. His research is on international climate change policy architectures; emissions trading programs and other mitigation policies; and the relationship between economic development and greenhouse gas emissions.

Mustafa Babiker holds a BSc in Econometrics and Social Statistics from the University of Kartoum, Sudan, and an MA and PhD in Economics from the University of Colorado-Boulder. He has served as an economist with the MIT Joint Program on the Science and Policy of Global Change and the Arab Planning Institute, and he continues work with the Joint Program on applications of its Emissions Prediction and Policy Analysis model.


Geoffrey J. Blanford currently manages the climate policy research program at the Electric Power Research Institute. His research focuses on energy-economy modeling and the development of integrated assessment tools for application to international climate agreements and technology policy decisions. He has authored
several analyses using the MERGE model and holds a PhD in management science and engineering from Stanford University.

Valentina Bosetti holds a PhD in Computational Mathematics and Operations Research from the Università Statale of Milan and an MA in Environmental and Resources Economics from University College London. At the Fondazione Eni Enrico Mattei, in Italy, since 2003, she works as a modeler for the Sustainable Development Program, leading the Climate Change Modeling and Policy initiative. She is currently a visiting researcher at the Princeton Environmental Institute.

Katherine Calvin is a Research Economist at the Pacific Northwest National Laboratory’s Joint Global Change Research Institute. Dr. Calvin’s research focuses on international climate policy regimes, integrated assessment modeling, and the implications of carbon policy on agriculture and land use.

Jing Cao is an assistant professor in the School of Economics and Management, Tsinghua University, Beijing. She is also an affiliated researcher at The Center for China in the World Economy at Tsinghua, at Environmental Development (China Center), and at the Harvard China Project. She has a PhD in Public Policy from Harvard University. Her research focuses on environmental taxation, climate change economics and modeling, productivity measurements, and economic growth.

Carlo Carraro is Professor of Environmental Economics at the University of Venice and Director of Research of the Fondazione Eni Enrico Mattei. He is Vice Chair of IPCC Working Group III and Director of the Climate Impacts and Policy Division of the EuroMediterranean Centre on Climate Change. He holds a PhD from Princeton University and is a Research Fellow of CEPR, CESifo and CEPS.

Wenyeng Chen is Professor in the Institute of Energy, Environment, and Economy, Tsinghua University, Beijing. Her research focuses on energy modeling, integrated assessment models in climate change, carbon capture and storage, and energy systems analysis. Professor Chen has led a number of national and international research projects in the field of energy and climate change.

Leon Clarke is Senior Research Economist at the Pacific Northwest National Laboratory’s Joint Global Change Research Institute. Dr. Clarke’s research focuses on technology planning for climate change, climate mitigation scenarios, international climate policy, and integrated assessment of climate change.
Richard N. Cooper is Maurits C. Boas Professor of International Economics at Harvard University. He is Vice-Chairman of the Global Development Network and a member of the Trilateral Commission, the Council on Foreign Relations, the Executive Panel of the US Chief of Naval Operations, and the Brookings Panel on Economic Activity. He has served on several occasions in the US Government, most recently as chairman of the National Intelligence Council (1995–1997).

Jae Edmonds is Chief Scientist and Laboratory Fellow at the Pacific Northwest National Laboratory’s Joint Global Change Research Institute, Adjunct Professor of Public Policy at the University of Maryland-College Park, and has actively participated in the IPCC. His research in the areas of long-term, global energy, technology, economy, and climate change spans three decades, producing several books and numerous scientific papers and presentations.

A. Denny Ellerman is Senior Lecturer at MIT’s Sloan School of Management and an internationally recognized expert on energy and environmental economics with a particular focus on emissions trading. He is a co-author of the leading book on the US SO₂ Trading Program, *Markets for Clean Air*, and co-editor of *Allocation in the European Emissions Trading Scheme*. He earned a PhD in political economy and government from Harvard University.

Carolyn Fischer is Senior Fellow at Resources for the Future in Washington, DC. Her research addresses a variety of environmental policy issues, including climate change mitigation, technological change, international trade and environmental policies, and resource economics. She holds a PhD in Economics from the University of Michigan and a BA in International Relations from the University of Pennsylvania, and she previously served at the White House Council of Economic Advisors.

Jeffrey Frankel is Harpel Professor at Harvard’s Kennedy School. He directs the program in International Finance and Macroeconomics at the National Bureau of Economic Research, where he is also on the Business Cycle Dating Committee. He served on President Clinton’s Council of Economic Advisers (1996–1999), with responsibility for environmental, international, and macroeconomics. Earlier he was professor of economics at the University of California, Berkeley. His Economics PhD is from MIT.

Daniel S. Hall is Research Associate at Resources for the Future, where his work focuses on climate change policy, including mechanisms for cost containment, the design of offset programs, and legislative analysis. Hall holds a Master of Environmental Science and Management from the Donald Bren School at the University of California, Santa Barbara.
List of contributors

Bård Harstad is Associate Professor at the Kellogg School of Management, Northwestern University. In recent years he has developed theories for international political economy, with a particular focus on international bargaining and the design elements of environmental agreements. His research has been published in *American Economic Review, Quarterly Journal of Economics*, and *Scandinavian Journal of Economics*.

Jiankun He is the Director of the Low Carbon Energy Laboratory at Tsinghua University, China. Professor He’s research interests include energy systems engineering and energy modeling, strategic responses to climate change, resource management, and sustainable development. He has been the principal investigator of a number of national key research projects and international collaborative research projects.

Henry D. Jacoby is Professor of Management in the MIT Sloan School of Management and Co-Director of the MIT Joint Program on the Science and Policy of Global Change. He holds a PhD in Economics from Harvard, where he served in the Department of Economics and the Kennedy School of Government. He serves on the Scientific Committee of the International Geosphere-Biosphere Program and on the Climate Research Committee of the National Research Council.

Judson Jaffe is a Vice President at Analysis Group, Inc. He previously spent two years on the staff of the Council of Economic Advisers at the White House, where he provided economic analysis of environmental and energy policy. He received an MPhil in Economics from Cambridge University, and an AB *summa cum laude* in Environmental Science, Public Policy, and Economics from Harvard University.

Larry Karp is Professor of Agricultural and Resource Economics and the Department Chair at the University of California, Berkeley. His research and teaching interests include environmental economics, trade policy, dynamic methods, and industrial organization. He is Associate Editor of the *Journal of Economic Dynamics and Control* and has served as Co-editor of the *Journal of Environmental Economics and Management*. He is a Fellow of the Agricultural and Applied Economics Association.

Andrew Keeler teaches at the John Glenn School of Public Affairs at the Ohio State University and writes on state, national, and international climate change policy. He served as the Senior Staff Economist for Environment at the President’s Council of Economic Advisers (2000–2001) where he was a member of the US negotiating team for climate change and a diplomatic representative to OECD meetings on coordinating national sustainability policies.
List of contributors

Robert O. Keohane is Professor of International Affairs, Princeton University. He is the author of After Hegemony (1984) and Power and Governance in a Partially Globalized World (2002). He is co-author (with Joseph S. Nye, Jr.) of Power and Interdependence (third edition 2001) and (with Gary King and Sidney Verba) of Designing Social Inquiry (1994). He is a member of the American Academy of Arts and Sciences, the American Philosophical Society, and the National Academy of Sciences.

Page Kyle is a research analyst with the Pacific Northwest National Laboratory's Joint Global Change Research Institute. His research focuses on modeling of greenhouse gas emissions from end-use energy consumption and secondary fuel production, with particular attention to technological development and climate change mitigation.

Michael A. Levi is the David M. Rubenstein Senior Fellow for Energy and the Environment at the Council on Foreign Relations (CFR) and Director of its Program on Energy Security and Climate Change. He was project director for a recent CFR-sponsored independent task force on climate change, and is the author of On Nuclear Terrorism (Harvard University Press, 2007) and The Future of Arms Control (Brookings Institution Press, 2005).

Warwick J. McKibbin is Professor and Director of the Centre for Applied Macroeconomic Analysis in the College of Business and Economics at the Australian National University. He also holds positions at the Lowy Institute for International Policy and the Brookings Institution. He is a member of the policy Board of the Reserve Bank of Australia. Professor McKibbin received a PhD in Economics from Harvard University in 1986.

Richard D. Morgenstern is Senior Fellow at Resources for the Future and has written widely on climate change mitigation policy. His involvement in the issue reaches back two decades and includes his work at the US EPA, where he directed the Agency's climate change activities and, subsequently, as a member of the State Department's negotiating team for the Kyoto Protocol.

Adele Morris is a fellow and Deputy Director for Climate and Energy Economics at the Brookings Institution. Her economic and natural resource policy experience includes work at the Joint Economic Committee of Congress, the US Treasury, the President’s Council of Economic Advisers, and OMB. She was a lead climate negotiator with the US State Department in 2000. She holds a PhD in Economics from Princeton University.
Richard G. Newell is Gendell Professor of Energy and Environmental Economics, Nicholas School of the Environment, Duke University; a Research Associate, National Bureau of Economic Research; and a University Fellow, Resources for the Future. He has served as Senior Economist for energy and environment on the President’s Council of Economic Advisers and on several National Academy of Sciences committees related to energy, environment, and climate. His PhD is from Harvard University.

Sergey V. Paltsev is Principal Research Scientist at the Joint Program on the Science and Policy of Global Change at the Massachusetts Institute of Technology, where he has been working since 2002 as the lead modeler in charge of the MIT Emissions Prediction and Policy Analysis (EPPA) model, a multi-regional computable general equilibrium model of the world economy that has been widely used to study climate change policy.

William A. Pizer is the Deputy Assistant Secretary for Environment and Energy at the US Department of the Treasury. Prior to coming to Treasury, and throughout his involvement with the Harvard Project, Pizer was a Senior Fellow at Resources for the Future where his research looked at how the design of environmental policy affects costs and environmental effectiveness, often related to global climate change. He holds a PhD in Economics from Harvard University.

Andrew J. Plantinga is Professor of Agricultural and Resource Economics at Oregon State University. He received a PhD in Agricultural and Resource Economics from the University of California, Berkeley and an MS in Forestry from the University of Wisconsin-Madison. His research on the economics of land use is supported by the National Science Foundation, the US Forest Service, and the US Department of Energy.


Kal Raustiala is a professor at UCLA Law School and the UCLA International Institute, where he is also Director of the Ronald W. Burkle Center for International Relations. His previous publications include The Implementation and Effectiveness of International Environmental Commitments (MIT, 1998), co-edited with David G. Victor and Eugene Skolnikoff.
List of contributors

John M. Reilly is the Associate Director for Research in the Joint Program on the Science and Policy of Global Change and a Senior Lecturer in the Sloan School at MIT. Prior appointments were with the USDA’s Economic Research Service and the US DOE National Laboratories. He holds a PhD in economics from the University of Pennsylvania. His research has focused on the economics of energy, agriculture, and climate change.

Kenneth R. Richards is an associate professor at the School of Public and Environmental Affairs and an adjunct professor at the Maurer School of Law, Indiana University. He holds a PhD in Public Policy and a JD from the University of Pennsylvania. He is associate director of the Richard G. Lugar Center for Renewable Energy in Indianapolis and the Center for Research in Energy and the Environment in Bloomington, Indiana.

Richard G. Richels is Senior Technical Executive for global climate change research at the Electric Power Research Institute and is Adjunct Professor at the Johns Hopkins School of Advanced International Studies. He has served on a number of national and international advisory panels, including committees of the Department of Energy, the Environmental Protection Agency, the National Research Council, and the Intergovernmental Panel on Climate Change.

Thomas F. Rutherford has been Professor of Energy Economics at ETH Zürich since January, 2008. He earned a PhD in Operations Research from Stanford University under the supervision of Alan S. Manne. He subsequently had academic appointments in economics at the University of Western Ontario and the University of Colorado. Professor Rutherford’s main research areas concern the formulation and analysis of computational economic equilibrium models.

Akihiro Sawa is Senior Executive Fellow at the 21st Century Public Policy Research Institute, Keidanren, Tokyo, Japan. He was previously Director of Environmental Policy (2001–2003) and Director of Resources and Fuel Policy (2003–2004) for the Ministry of Economy, Trade and Industry of the Government of Japan and a Professor at the Research Center for Advanced Science and Technology, University of Tokyo (2004–2008).

Richard Schmalensee is the Howard W. Johnson Professor of Economics and Management at MIT and Director of the MIT Center for Energy and Environmental Policy Research. He has served as the John C. Head III Dean of the MIT Sloan School of Management (1998–2007) and as the Member of the President’s Council of Economic Advisers with responsibility for environmental policy (1989–1991).
Alessandra Sgobbi holds a PhD in Analysis and Governance of Sustainable Development at the School for Advanced Studies in the Venice Foundation. She collaborates with the Fondazione Eni Enrico Mattei, in Italy, on various projects in the field of natural resources management and climate change. Currently, she works at the European Commission, EuropeAid Cooperation Office, focusing on development interventions in the fields of sustainable consumption and production, energy efficiency, and the “grey” environment.

E. Somanathan received a PhD in economics from Harvard in 1995 and taught at Emory University and the University of Michigan at Ann Arbor before joining the Indian Statistical Institute, Delhi, where he is Professor in the Planning Unit. His main research interest is in development economics, particularly environmental problems and political economy. He is writing a book on environmental issues in India.

Robert N. Stavins is Albert Pratt Professor of Business and Government, Harvard Kennedy School; Director, Harvard Environmental Economics Program; Director, Harvard Project on International Climate Agreements; University Fellow, Resources for the Future; Research Associate, National Bureau of Economic Research; and Editor, Review of Environmental Economics and Policy. He was Chairman, US EPA Environmental Economics Advisory Committee, and Lead Author, Intergovernmental Panel on Climate Change. He holds a PhD in economics from Harvard.

Cass R. Sunstein is the Felix Frankfurter Professor of Law at Harvard Law School. A former attorney-adviser in the Office of Legal Counsel in the Department of Justice, he is author or co-author of more than fifteen books and hundreds of scholarly articles. Sunstein joined the law faculty of the University of Chicago in 1981 and later became the Karl N. Llewellyn Distinguished Service Professor of Jurisprudence at the University.

Massimo Tavoni is a Senior Researcher at the Fondazione Eni Enrico Mattei, in Italy, and is now a post-doctoral research fellow at the Princeton Environmental Institute. His research interests include international climate mitigation policies, technological evolution and uncertainty, and the role of tropical deforestation. He holds an MSc in Mathematical Economics from the London School of Economics and a PhD in Political Economics from the Catholic University of Milan.

Fei Teng is Associate Professor at the Institute of Energy, Environment, and Economy, Tsinghua University, Beijing. His research interests include climate policy analysis, energy policy analysis, and technology transfer mechanisms in climate regimes. He is a review expert for the CDM DNA in China and also a member of the Chinese delegation to the UNFCCC and its Kyoto Protocol.
List of contributors

Alexander Thompson is Associate Professor of Political Science at the Ohio State University. He has research interests in the areas of international organizations and US foreign policy. He is the author of *Channels of Power: The UN Security Council and U.S. Statecraft in Iraq* (Cornell University Press, 2009) and articles in various journals, including *International Organization*, the *Journal of Conflict Resolution*, and the *Journal of Legal Studies*.

Takahiro Ueno is a researcher at the Socio-economic Research Center of the Central Research Institute of Electric Power Industry, Japan. He was a Visiting Scholar at Resources for the Future in 2006 and 2007. He has researched international negotiations on climate change, energy and environmental technology policy, international cooperation on energy efficiency, and technology transfer to developing countries.

David G. Victor is Professor at Stanford Law School and Director of the Program on Energy and Sustainable Development; he also serves as Senior Fellow at the Council on Foreign Relations. His current research focuses on the performance of state-controlled oil companies, on global climate protection, and on the emerging global market for coal. His PhD is from the Massachusetts Institute of Technology and his BA is from Harvard University.

Peter J. Wilcoxen is Associate Professor of Economics and Public Administration at the Maxwell School of Syracuse University and a Nonresident Senior Fellow at the Brookings Institution. He has published extensively on energy and environmental policy and is currently a member of the US EPA’s Environmental Economics Advisory Committee. He holds a BA in physics from the University of Colorado and a PhD in economics from Harvard University.

Timothy E. Wirth has been President of the United Nations Foundation since its founding in 1998. He represented Colorado in the US House of Representatives from 1975 to 1987 and the US Senate from 1987 to 1993. From 1993 to 1997, he served as the first US Under Secretary of State for Global Affairs, leading the US team preparing for the Kyoto climate negotiations. He received a PhD from Stanford University.

Marshall Wise is Senior Research Scientist at Battelle’s Joint Global Change Research Institute at the University of Maryland. Wise is a long-time member of the MiniCAM integrated assessment model development team with expertise in economic modeling and analysis of energy systems, with experience in both broad-scale energy policy analysis and in detailed analysis of the electric power generation sector.
List of contributors

Jinhua Zhao is an associate professor in the Department of Economics and the Department of Agricultural, Food and Resource Economics at Michigan State University. His research interests include applied microeconomic theory, environmental and resource economics, energy economics, and dynamic decision making under uncertainty, among others. He was a co-editor of the *Journal of Environmental Economics and Management* (JEEM) and is on the editorial council of JEEM and the *Review of Development Economics*. 

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Foreword

Timothy E. Wirth

Washington, DC
February 5, 2009

When Charles Keeling began measuring carbon dioxide at Mauna Loa in 1958, the atmospheric concentration was 315 parts per million (ppm). That number represented an increase of 12.5 percent from the pre-industrial level of 280 ppm. Fifty years later, it has reached 385 ppm, and the rate of increase has doubled.

As the Swedish chemist Svante Arrhenius predicted in 1896, those increased levels of carbon dioxide or CO2 are warming the surface temperature of the Earth. The results are evident all around us. The world’s tropical belt has expanded toward the poles by two degrees of latitude – as much as had been predicted for the entire twenty-first century. The Greenland ice sheet, which holds enough water to raise global sea levels by 20 feet, is melting at an accelerated rate. The Arctic Ocean – engine of the Northern Hemisphere’s weather – could be ice-free during the summer within five years.

Civilization was built around the climate we have – along coastlines that may be washed away by storms and rising sea levels; around farmland and forests that will become less productive as water supplies diminish; at elevations cool enough to escape insect-borne disease. Changing the climate puts the very organization of modern societies at risk.

We cannot avoid climate change altogether. The effects of our actions are already clear. For all practical purposes, they are irreversible. We can, however, limit the damage, and toward that end, the world must act – urgently, dramatically, and decisively.

This summary of an important new volume – the product of the Harvard Project on International Climate Agreements – recognizes the gravity and complexity of the climate challenge. It attempts to show the way forward, building on a rich variety of contributions from more than two dozen experts.
Joseph Aldy and Robert Stavins have underscored design elements for a new international climate regime that meet three well-chosen criteria: They must be scientifically sound, economically rational, and politically pragmatic.

Publication could not be more timely. The world is poised at a hinge of history. Civilization’s future rests with decisions yet unmade. Hope and fear collide.

Scientists agree that time is running out for concerted action to avert the worst consequences of climate change. The process that was initiated in Rio de Janeiro in 1992, when agreement was reached on the United Nations Framework Convention on Climate Change, must now achieve a new level of commitment. For the essential objective of the Rio treaty – ratified by the United States and nearly every country of the world – was to prevent “dangerous anthropogenic interference with the climate system.” Now, physical evidence of climate change suggests that point has already been passed. Some climate scientists say the world must limit atmospheric CO₂ not to 550 ppm (a doubling of pre-industrial levels), or to 450 ppm (the number often associated with a global warming of 2° C), but to 350 ppm – the level passed 20 years ago – to avoid irreversible melting of the Greenland ice sheet and disastrous sea-level rise.

In December 2007, representatives of 187 countries agreed in Bali on a road map to replace the Kyoto Protocol when it runs out in 2012 and more effectively confront climate change over the long term. Ban Ki-moon, the Secretary-General of the United Nations and a new voice of global leadership, has made climate change one of his top priorities at the UN. “Today we are at a crossroads,” he said at Bali, “one path towards a comprehensive new climate agreement, and the other towards a betrayal of our planet and our children. The choice is clear.”

Ban left the talks, but when they threatened to founder, he returned to urge the negotiators on. They listened, and adopted a two-year plan for reaching a new agreement. With the inauguration of Barack Obama as US President in January 2009, the world’s largest economy is prepared to participate constructively again. Many countries are hoping that the United States will be the cavalry riding to the rescue; it remains to be seen whether that hope is too audacious.

What are the key elements of an agreement? The Bali road map identifies four: mitigation, adaptation, technology, and finance. In the parlance of climate negotiations, “mitigation” means reducing greenhouse gas emissions, and “adaptation” means preparing for climate impacts that cannot be avoided. “Technology” refers to the need, not just to develop cleaner ways
of producing and using energy, but also to deploy those technologies on an appropriate scale in rich and poor countries alike. “Finance” encompasses both the mechanisms and investment flows that will enable poor countries to adapt and acquire clean energy technologies.

The UN Framework Convention of 1992 established the principle that countries should engage the climate challenge “on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.” Developed countries, especially the United States, were expected to lead because over many years they have contributed the most to the buildup of greenhouse gases in the atmosphere. Meaningful engagement of developing countries, especially of rapidly industrializing economies like China and India, is needed also. All countries must be part of the solution, not just the industrialized countries that caused the problem, but the poorest countries that will feel its effects most acutely.

The question of who has what responsibility, and when obligations will kick in, is the central issue in international climate negotiations, and one that will also be critical to the future ratification of any new climate protocol in the United States and around the world. We must be flexible enough to recognize and accept the value of diverse approaches to the climate challenge.

This Summary for Policy Makers – and the edited volume it distills – reflects that imperative, drawing on scholars from China, India, Japan, and Australia, as well as Europe and the United States. There are many good ideas here – too many to summarize briefly. Aldy and Stavins, in their valuable synthesis, point to four potential architectures for agreement. In many ways the four can coexist and support each other:

- Binding emissions caps are needed to bring about reductions from major greenhouse gas sources, although some rapidly industrializing countries may have to step up to that responsibility gradually. Using formulas to allocate reductions is a promising approach for avoiding decisions based simply on politics and power.
- Harmonized domestic policies would facilitate effective implementation of emissions cuts and reduce both the cost of compliance and the political resistance to carbon limits.
- A system of harmonized carbon taxes would generate revenues equitably to support a comprehensive climate response.
- Linked national cap-and-trade systems, based on permit auctions implemented “upstream,” would do the same.

The relationship between these approaches can be seen by considering how best to encourage technology deployment and economic development.
Solving the climate crisis will require nothing less than a fundamental transformation of global energy systems. In the United States, transportation and electricity generation are the two largest sources of emissions. In rapidly industrializing nations like China and India, power generation, manufacturing, and transportation are the fastest-growing sources. A new generation of climate-friendly technologies will be needed to reduce emissions quickly and at low cost.

The global recession that began in 2008 as a result of turbulence in world financial markets creates new barriers, as well as new opportunities for major new investments in clean energy technologies. Falling commodity prices, especially for oil, have reduced political pressure for immediate action on energy policy even as capital for new projects has become much more difficult to obtain. The need for substantial government spending to revive the economy, on the other hand, provides a potential stimulus to jump-start the transition to new energy technologies.

In the US presidential election of 2008, both major party candidates made investment in renewable energy a centerpiece of their campaigns, reflecting the breadth of bipartisan support for a change in direction. Research and development are not enough, though – new market signals are essential for this technological revolution to succeed. The most important step is to put a price on carbon, either through a cap-and-trade system or a carbon tax. The purpose is not to penalize consumers with higher energy costs. Rather it is to set the rules of the game so that clean technologies can compete with dirty ones – and indeed, out-compete them over time. This will lead to a great wave of innovation, investment, economic development, and job creation.

Serious action by the United States to significantly reduce its emissions is not only the right thing to do; it is also a precondition for US credibility and global leadership on climate. Without it, other countries will have a convenient excuse for inaction.

Key steps to reduce emissions will include increased efficiency, the transformation of the transportation sector through advanced biofuels and plug-in hybrids, and the phase-out of conventional coal-fired power generation. Such steps could become the basis for harmonized national policies – setting, for example, targets for improvement in energy efficiency and deployment of renewable energy – that could be endorsed globally as confidence-building steps toward a new climate agreement.

The US-China relationship is critical to such progress. These countries are the world’s two largest emitters of greenhouse gases, and neither accepted any restrictions under the Kyoto protocol. China continues to resist the idea
of binding targets, but on its own has set a target of improving the energy efficiency of its economy by an extraordinary 4 percent per year. China has also imposed vehicle fuel economy standards stricter than those of the United States and plans to double its renewable energy capacity (to 15 percent of its overall energy supply mix) by the year 2020. These steps could be a model for other countries and the basis for voluntary targets, globally agreed.

Developing countries, especially China and India, will account for the lion’s share of global emissions growth over the coming years. In China alone, as many as 500 million people will join the middle class, gaining access to electricity and motorized transportation, in the next 20 years. In recent years, China has been expanding its coal base at the rate of one large new coal-fired power plant, on average, every week, and India aspires to similar economic growth. Getting these countries to grow cleanly, therefore, is absolutely essential to climate stabilization. The idea of giving handouts to increasingly formidable competitors overseas is politically toxic in many developed countries, but more robust cooperation in areas of mutual interest – such as advancing carbon capture technology for coal plants – would accelerate technology development and deployment to the benefit of all.

Development and clean energy should go hand in hand – the limitations of the dirty energy path are more manifest by the day – but the phrase “technology transfer” has an unfortunate ring. It suggests hand-me-downs from rich countries to poor. Instead, nations that are technology leaders should collaborate on a new international initiative to facilitate cooperation with developing countries on low-cost clean-energy technologies. Working together through regional innovation centers, researchers would adapt these technologies to their countries and help them “leapfrog” over climate-damaging business-as-usual patterns of development, much as the advent of cell phones averted a massive buildout of telecommunications infrastructure.

Managing the climate crisis requires new forms of international cooperation to reduce global emissions and help vulnerable societies adapt. The UN is the appropriate venue for global negotiation, and in many cases the right institution to coordinate and deliver international response measures. The United States can lead this global effort by reducing its own emissions, encouraging other nations to implement bold mitigation policies, spurring technological innovation at home and abroad, speeding adoption of clean energy technologies by rapidly developing nations, and providing adaptation assistance to poor nations.

International climate negotiations are complex – to be successful, they will require political resolve, creative negotiating, innovative policy mechanisms,
stronger global institutions, and additional financial resources. None of this will be easy, but a flexible and positive approach can yield results if it focuses – as the Harvard Project does – on solutions that are scientifically sound, economically rational, and politically pragmatic. The world can afford no less. If this volume moves negotiators closer to that goal, the Harvard Project on International Climate Agreements will have provided value indeed.