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978-0-521-13800-0 — Post-Kyoto International Climate Policy
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Post-Kyoto International Climate Policy

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.

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Post-Kyoto International Climate Policy

Summary for Policymakers

Joseph E. Aldy and Robert N. Stavins

Research from the Harvard Project on International Climate Agreements

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To my inspiration, Sarah
J. E. A.

To my loving wife, Joanna
R. N. S.

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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 CO_2 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.

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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 CO_2 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

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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.

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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

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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,

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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.

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