

## INTERNATIONAL CLIMATE TECHNOLOGY STRATEGIES

BY RICHARD G. NEWELL



## OVERVIEW

Policies facilitating innovation and large-scale adoption of low-carbon technologies will need to play a central role in global efforts to address climate change, alongside policies targeted directly at reducing emissions. This paper considers opportunities for improved and expanded international technology development and transfer strategies within the broader context of international agreements and institutions for climate, energy, trade, development, and intellectual property.

## DISCUSSION

Achieving the deep reductions in greenhouse gas (GHG) emissions necessary to stabilize atmospheric GHG concentrations will require substituting energy technologies with low to zero net GHG emissions throughout the global energy system. The scale of the task is immense. According to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), an additional \$200 billion in global investment and financial flows will be required annually by 2030 just to return GHG emissions to current levels. This is in addition to the roughly \$900 billion per year in global energy infrastructure investments the International Energy Agency (IEA) estimates will be needed over the 2006–2030 timeframe simply to keep up with expected demand growth.

In this context, innovations that significantly reduce the cost disadvantage of climate-friendly technologies relative to the competition could provide enormous economic and environmental benefits, substantially reducing the costs of mitigation and potentially making it feasible to undertake more significant reductions. The associated policy debate is therefore not so much over the importance of technology per se, but rather over what policies and institutions would most effectively and efficiently spur the technology advances needed to address the problem.

## KEY FINDINGS &amp; RECOMMENDATIONS

Recognizing that any successful effort to accelerate and then sustain the rate of development and transfer of GHG mitigation technologies must harness a diverse set of markets and institutions, this paper recommends several specific issues and actions for consideration in international climate policy discussions:

- *Long-term national commitments and policies for emission mitigation are crucial to providing the necessary private sector incentives for technology development and transfer.* Absent the market pull of a financial incentive for reducing GHG emissions, R&D efforts by themselves will have little impact. Private sector trade, investment, and innovation—motivated by widespread global demand for low-GHG technologies—will be essential to moving the energy system in the desired direction.
- *Financial assistance to developing countries for technology transfer and capacity building is also necessary.* At the same time, GHG-related guidelines for financing by Export Credit Agencies (ECAs) and multilateral development banks can help ensure that trade and development assistance investments are consistent with climate mitigation goals.
- *In addition to increased incentives, barriers to climate-friendly technology transfer could be reduced through a World Trade Organization (WTO) agreement to reduce tariff and non-tariff barriers to trade in environmental goods and services.* Development and harmonization of technical standards—by international standards organizations in consultation with the IEA and WTO—could further reduce impediments to technology transfer and accelerate the development and adoption of climate-friendly innovations.

➤ *To support the upstream supply and transfer of new climate technology innovations internationally, strategies are needed to increase and more effectively coordinate public funding of R&D.* Specifically, a framework for coordinating and augmenting climate technology R&D could be organized through a UNFCCC Expert Group on Technology Development, supported by the IEA. Broadening IEA participation to include large non-OECD energy consumers and producers could also facilitate such coordination. An agreement could include a process for reviewing country submissions on technology development and for identifying redundancies, gaps, and opportunities for closer collaboration. A fund for cost-shared R&D tasks and international technology prizes could be established to provide financing for science and innovation objectives that are best pursued in a joint fashion. The agreement could also include explicit targets for increased domestic R&D spending on GHG mitigation.

➤ *Strategies are also needed to resolve impediments to knowledge transfer in the context of policies for the protection of intellectual property.* To that end, an Expert Group on Technology Development, the World Intellectual Property Organization (WIPO), and the WTO could work jointly to develop recommendations for addressing technology development and transfer opportunities and addressing intellectual property issues. A fund could be established in WIPO or another appropriate body for related technical assistance, capacity building, and possibly to purchase intellectual property or cover related costs.

## CONCLUSION

The range of opportunities for improved and expanded international climate technology development and transfer extends well beyond the usual boundaries of environmental decision-makers to the broader context of international agreements and institutions for energy, trade, development, and intellectual property. The technology challenge implicit in successfully addressing climate change along with our other energy problems is enormous. It requires a portfolio of strategies for reducing barriers and increasing incentives for innovation across international agreements and institutions in a way that maximizes the impact of scarce public resources and effectively engages the capacities of the private sector.

## AUTHOR AFFILIATION

**Richard G. Newell**, *Gendell Associate Professor of Energy and Environmental Economics*, Nicholas School of the Environment, Duke University

## ABOUT THE HARVARD PROJECT ON INTERNATIONAL CLIMATE AGREEMENTS

The goal of the Harvard Project on International Climate Agreements is to help identify key design elements of a scientifically sound, economically rational, and politically pragmatic post-2012 international policy architecture for global climate change. It draws upon leading thinkers from academia, private industry, government, and non-governmental organizations from around the world to construct a small set of promising policy frameworks and then disseminate and discuss the design elements and frameworks with decision-makers. The Project is co-directed by Robert N. Stavins, Albert Pratt Professor of Business and Government, John F. Kennedy School of Government, Harvard University, and Joseph E. Aldy, Fellow, Resources for the Future.

Major funding for the Harvard Project on International Climate Agreements has been provided by a grant from the Climate Change Initiative of the Doris Duke Charitable Foundation. Additional support has been provided by Christopher P. Kaneb (Harvard AB 1990); the James M. and Cathleen D. Stone Foundation; Paul Josefowitz (Harvard AB 1974, MBA 1977) and Nicholas Josefowitz (Harvard AB 2005); the Enel Endowment for Environmental Economics at Harvard University; the Belfer Center for Science and International Affairs at the Harvard Kennedy School; and the Mossavar-Rahmani Center for Business and Government at the Harvard Kennedy School.

**Project Email:** [climate@harvard.edu](mailto:climate@harvard.edu)

**Full paper available at:** <http://belfercenter.ksg.harvard.edu/publication/18641>