APPENDIX E: FURTHER READING

The literature on the causes, consequences, and policy responses concerning climate change is vast. The following is a brief introduction, with emphasis on sources that are available on the web and sources that focus on issues relevant for U.S. policy. To offer a manageable drink from the fountain rather than a firehose of completeness, much excellent material has been omitted.

ON THE CAUSES AND CONSEQUENCES OF CLIMATE CHANGE:

For the most comprehensive international reports on the causes and possible consequences of climate change, see the results of the Intergovernmental Panel on Climate Change at http://www.ipcc.ch

These reports have framed much of the debate; however, the U.S. government has also periodically asked the National Academy of Sciences to investigate particular issues. For several of their most important reports, see:

- "Reconciling Observations of Global Temperature Change" (2000): http://books.nap.edu/books/0309068916/html/
- "Climate Change Science: An Analysis of Some Key Questions" (2001): http://books.nap.edu/books/0309075742/html/
- "Abrupt Climate Change: Inevitable Surprises" (2002): http://books.nap.edu/openbook/0309074347/html/
- "Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards" (2002): http://books.nap.edu/books/0309076013/html/
- "The Hydrogen Economy: Opportunities, Costs, Barriers, and R&D Needs" (2004): http://books.nap.edu/books/0309091632/html/

For more on the impacts of climate change in the United States, see the National Assessment; the main findings are reprinted in Appendix B; complete text at http://www.usgcrp.gov/usgcrp/nacc/default.htm

For one of several research groups engaged in the integrated study of the scientific, economic, and policy aspects of climate change, see:

- http://web.mit.edu/globalchange/www

For more eclectic and highly opinionated accounts, here are two particularly active and irreverent sources:

- Stephen H. Schneider, "Climate Change": http://stephenschneider.stanford.edu/
- Science and Environmental Policy Project: http://www.sepp.org/

For an excellent history of the science, see:

- Spencer Weart, *The Discovery of Global Warming* (Cambridge: Harvard University Press, 2003)

ON THE ECONOMIC COSTS OF CONTROLLING EMISSIONS:

When Kyoto was taking shape there were many efforts to model the economic consequences. "The Costs of the Kyoto Protocol: A Multi-Model Evaluation," a far-ranging and systematic intercomparison of model results in Stanford University's Energy Modeling Forum (EMF), provides a good introduction to the results: http://www.iaee.org/en/publications/kyoto.aspx

The EMF also contributed heavily to the IPCC reports (cited above), and chapters in the report from IPCC Working Group #3 provide overviews of the issues and introduce in detail some of the controversies in economic modeling.

A key issue in assessing possible costs of control is the future structure of the world and regional energy systems. Here are two reports on that:

- On the world's energy systems generally, with assessments of key regions, see the International Energy Agency *World Energy Outlook* (2002) and *World Energy Investment Outlook* (2003): http://www.worldenergyoutlook.org/pubs/index.asp
- On emissions of greenhouse gases by the United States, see the EPA U.S. Emissions Inventory: http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsGHGEmissionsUSEmissionsInventory2004.html

- On future emissions, see the IPCC Special Report on Emission Scenarios (SRES): http://www.grida.no/climate/ipcc/emission/

Expectations about the prices and acceptability of major fuels will have a large impact on the cost of controlling carbon. For more, see the following:

- On natural gas and the current price spikes in the United States, see the National Petroleum Council report: http://www.npc.org/
- On nuclear power, which offers zero-carbon electricity but raises many questions about public acceptability, see: http://web.mit.edu/nuclearpower/
- On the role of LNG in natural gas markets, see James T. Jensen, "The LNG Revolution": http://www.energyseer.com/iaeepapr.pdf
- On the geopolitical consequences of a shift to a global gas market, see the Baker-Stanford study "The Geopolitics of Natural Gas": http://pesd.stanford.edu/gas
- On coal, which accounts for 51 percent of U.S. electric power production but is high in carbon, see the Energy Information Administration Annual Coal Report (2002): http://www.eia.doe.gov/cneaf/coal/page/acr/acr_sum.html
- On the quantities of energy scenarios for stabilizing the atmosphere, see Hoffert et al., "Energy Implications of Future Stabilization of Atmospheric CO_2 Content," Nature 395 (1998): 881-884: http://eed.llnl.gov/cccm/pdf/Hoffert_et_al_Nature.pdf
- On the costs of stabilizing CO_2 emissions, see T. Wigley, R. Richels, and J. Edmonds: "Economics and Environmental Choices in the Stabilization of Atmospheric CO_2 Concentrations," Nature, 379 (1996): 240-243

For more information on emerging emissions trading systems, see:

- The European Union's emissions trading scheme: http://europa.eu.int/comm/environment/climat/emission.htm
- The Chicago Climate Exchange: http://chicagoclimateexchange.com

ON INNOVATION AND THE DESIGN OF TECHNOLOGY POLICIES:

Most of the relevant literature on technology policy is not written with the climate change problem in mind, as the question of whether and how the government can successfully intervene in the process of innovation is a generic one. For some windows into that literature, see:

- Richard R. Nelson, *National Innovation Systems: A Comparative Analysis* (Oxford: Oxford University Press, 1991)
- Linda R. Cohen and Roger G. Noll, *The Technology Pork Barrel* (Washington, DC: Brookings Institution Press, 1991)
- UNESCO *World Science Report* (1998): http://www.unesco.org/science/publication/eng_pub/wsren.htm
- Benn Steil, David G. Victor, and Richard R. Nelson, eds., *Technology Innovation and Economic Performance* (Princeton: Princeton University Press, 2002)

For such work focused specifically on energy, see:

- President's Committee of Advisors on Science and Technology (PCAST), Panel on Energy Research and Development (1997): http://neri.ne.doe.gov/docs/pcast/cover.pdf
- James J. Dooley (Pacific Northwest National Laboratory), "Energy Research and Development: Global Trends in Policy and Investment" (1999): http://energytrends.pnl.gov/
- Electric Power Research Institute, "About Strategic Science and Technology" (2004): http://www.epri.com/programDesc.asp?program=255855

ON INTERNATIONAL COOPERATION:

Key international agreements (the United Nations Framework Convention on Climate Change and the Kyoto Protocol), information on activities under those agreements, such as the Clean Development Mechanism (CDM), and links to government-reported data on emissions and policies can be found at http://unfccc.int

On the Prototype Carbon Fund, which aims to jump-start the CDM, see: http://www.prototypecarbonfund.org

ON THE DESIGN OF INTERNATIONAL ARCHITECTURES:

There is a large and growing literature on international "architectures" or "regimes" to address climate change. Much of it is based on analogies with other areas of international cooperation on environmental and economic problems as well as analogies with policy instruments that have been used to address national environmental problems, such as the sulfur dioxide emission trading program used in the United States. For some windows into that huge literature, see:

- Thomas C. Schelling, "Costs and Benefits of Greenhouse Gas Reduction," American Enterprise Institute Studies on Global Environmental Policy (Washington, DC: AEI Press, 1998)
- M. Granger Morgan, "Climate Change: Managing Carbon from the Bottom Up," *Science* 289 (2000): 2285
- David G. Victor, *The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming* (Princeton: Princeton University Press, 2001)
- Scott Barrett, *Environment and Statecraft: The Strategy of Environmental Treaty-Making* (Oxford: Oxford University Press, 2003)
- Joseph E. Aldy, Scott Barrett, and Robert N. Stavins, "Thirteen Plus One: A Comparison of Global Climate Policy Architectures," Faculty Research Working Paper Series, John F. Kennedy School of Government, Harvard University (2003): http://www.ksg.harvard.edu/cbg/eephu/Thirteen_plus_one.pdf
- Richard B. Stewart and Jonathan B. Wiener, *Reconstructing Climate Policy: Beyond Kyoto* (Washington, DC: AEI Press, 2003)
- Pew Center on Global Climate Change, "Beyond Kyoto: Advancing the International Effort Against Climate Change" (2003): http://www.pewclimate.org/global-warming-in-depth/all_reports/beyond_kyoto/index.cfm

ON PUBLIC ATTITUDES:

There have been many polls on climate change policy, and poll data require careful interpretation. The best introduction to the

results and sensitivity to issues such as the framing of questions is the Program on International Policy Attitudes: http://www.pipa.org/

In addition, researchers have struggled with the question of how to frame information about complex and uncertain scientific issues so that it is comprehensible and conveyed accurately. For the fullest project in this spirit, see the Center for Integrated Study of the Human Dimensions of Global Change: http://hdgc.epp.cmu.edu/

ON POLITICAL ACTIVISM:

There are many organizations large and small with a view on what is happening with the climate and how policymakers in the United States (and other countries) should respond. Here is a sampling of the field:

- BP on climate: http://www.bp.com/genericsection.do?categoryId=931&contentId=2016995
- California Climate Action Registry: http://www.climateregistry.org
- Center for Environmental Leadership in Business: http://www.celb.org
- Climate Action Network: http://www.climatenetwork.org/
- Competitive Enterprise Institute: http://www.cei.org
- Conservation International: http://conservation.org
- Environmental Defense: http://www.edf.org/system/templates/page/focus.cfm?focus=3
- ExxonMobil on climate: www2.exxonmobil.com/corporate/citizenship/corp_citizenship_enviro_overview.asp
- Heritage Foundation: http://www.heritage.org/research/energyandenvironment/issues2004.cfm
- National Environmental Trust: http://www.net.org/
- National Resources Defense Council: http://www.nrdc.org
- Pew Center on Global Climate Change, which offers the most elaborate of all these websites and includes extensive issue briefs: http://www.pewclimate.org
- Union of Concerned Scientists: http://www.ucsusa.org/
- World Wildlife Fund: http://www.worldwildlife.org/climate/climate.cfm

ON U.S. GOVERNMENT POLICIES AND APPROACHES AND ENVIRONMENTAL ISSUES IN THE 2004 PRESIDENTIAL CAMPAIGN:

President Bush has spoken about climate change issues several times: http://www.whitehouse.gov/infocus/environment/

In the Bush administration, the Council on Environmental Quality has played a central role in formulating policy on climate change: http://www.whitehouse.gov/ceq/

For the foreign policy aspects, see the Department of State Global Issues office: http://usinfo.state.gov/gi/global_issues/climate_change.html

For the 2003 Climate Stewardship Act (Senate Resolution 139) sponsored by Senators John McCain and Joseph Lieberman, see http://www.theorator.com/bills108/s139.html and for an analysis of the resolution, see http://www.eia.doe.gov/oiaf/servicerpt/ml/pdf/summary.pdf

For more on the organization of U.S. investment in climate science, see:

- The United States Global Change Research Program (http://www.usgcrp.gov/) and the United States Climate Change Science Program (http://www.climatescience.gov/USGCRP)
- The National Academy of Sciences review of the USCCSP (2004): http://www4.nationalacademies.org/news.nsf/isbn/0309088658?OpenDocument
- The National Oceanic and Atmospheric Administration: http://www.noaa.gov/climate.html
- Lawrence Berkeley National Laboratory: http://www esd.lbl.gov/CLIMATE/index.html
- The Environmental Protection Agency: http://yosemite.epa.gov/oar/globalwarming.nsf/content/index.html

For more on the U.S. investment in technology, see:

- United States Climate Change Technology Program: http://www.climatetechnology.gov/about/
- FreedomCAR and Vehicle Technologies Program: http://avt.inel.gov/
- FutureGen Initiative: http://www.fossil.energy.gov/programs/powersystems/futuregen/