

Efficient Global Warming: Contradictions in Liberal Democratic Responses to Global Environmental Problems

John Byrne
Sun-Jin Yun

Center for Energy and Environmental Policy, University of Delaware

As liberal democracies, what can the United States, Europe, and Japan be expected to embrace as “democratic” solutions to global environmental problems such as climate change? It is our argument that contradictions in liberal democratic politics lead these states to advocate solutions that are nature-as-commodity oriented and that idealize the notion of “managed nature.” In the case of climate change, we specifically argue that liberal democracies can be expected to pursue a policy regime of “efficient global warming.”

Key words: *Environmental politics, climate change, sustainable development, democratic theory*

Can current liberal democracy address global environmental problems democratically? Although definitions of democracy vary, general agreement exists that liberal democratic societies embrace principles of civil accountability, political and social equality, and rationality (among others) in the formation of their polities and in their exercise of state power (cf. Dryzek, 1998; Wolin, 1960). Focusing on these accepted liberal democratic principles, we examine current climate change policy negotiations and identify three basic contradictions in liberal democratic politics: (a) the contradiction between liberalist discourses of state power and civil society, which, in the case of climate change negotiations, has resulted in democratic states marginalizing the role of civil expression in the development of national policy positions; (b) the contradictory interest of liberalism in efficiency and equality, which has led liberal democracies to advocate policies that jeopardize aims of sustainability; and (c) liberalist commitments to managerial ideology, which encour-

aged democratic states to support the capitalization of nature (Escobar, 1996). The anatomy of these contradictions in liberal democratic politics and their expression in and impact on climate change negotiations are examined below.

The Contradiction Between Liberalist Discourses of State Power and Civil Society

Recent public opinion surveys conducted in several developed countries document a widening gap between state and civil society on the issue of climate change. For example, according to a public opinion survey reported by *The New York Times* (November 28, 1997) on the eve of the Third Conference of Parties (COP-3) in Kyoto organized to set binding targets on so-called greenhouse gas (GHG) emissions of developed countries, most Americans were willing to act immediately, even at the cost of slowing the national economy, to prevent global warming. By contrast, the U.S. official position was that possible negative impacts on the national economy justified a “go slow” strategy. The Clinton administration proposed a modest goal of reducing GHG emissions to 1990 levels by the 2008-2012 period in the Kyoto negotiations.

Even before the administration’s proposal was announced, the U.S. Senate had passed a resolution opposing any treaty that did not include a commitment by developing nations to cap their emissions (U.S. Senate, 1997). However, the 1997 *New York Times* poll indicated that 65% of Americans recognized that the United States was the largest GHG emitter and, therefore, should take significant action first to cut its own emissions regardless of what other countries



would agree to do. Americans strongly favored environmental protection in the poll despite possible adverse impacts on the economy. Thus, it would appear that by the 1997 Kyoto negotiations the American public had rejected administration arguments against a climate change treaty, as well as those frequently voiced by the industry lobby and the U.S. Congress. Indeed, the survey suggested that most Americans agreed with the position taken by major environmental groups who urged an “act now” policy. Nevertheless, the United States officially opposed quick action at Kyoto, demanding that the Fourth Conference of Parties (COP-4) address the issue of developing country targets.

A 1998 poll released during the COP-4 in Buenos Aires reaffirmed American civil society’s commitment to an act now policy. The poll found that a majority of the American public supported U.S. acceptance of the requirements of the Kyoto Protocol even if developing countries did not agree to cut their emissions in the fight against global warming (International Press Service, 1998). The finding was at odds with the prevailing views among the Republican majority in the U.S. Senate (1997). The poll also found that a majority (63%) of the U.S. families were willing to accept an increase in energy costs of \$25 per month per household to comply with the Kyoto Protocol (which is roughly the amount at least one government study has estimated would be the actual costs with adoption of an emissions trading system—see the report, “The Kyoto Protocol and the President’s Policies to Address Climate Change” [U.S. Environmental Protection Agency, 1998]). In short, Americans again appeared to believe that global warming is a serious and imminent threat that should be addressed immediately even without “meaningful participation” of developing countries.

Similarly, although the Japanese government has taken a “go slow” approach to demands for GHG emissions reductions, surveys of the Japanese public indicate strong support for an activist climate change policy agenda. A 1997 public opinion survey by *Asahi Shimbun* (June 21, 1997) showed that 86% of the Japanese public were “very concerned” about global warming. Furthermore, most Japanese agreed that the society should reduce CO₂ emissions quickly despite possible adverse effects on the economy. Most of those polled (82%) agreed with the statement that the Japanese government is too conservative in its approach to global environmental problems, including global warming.

These survey results can be cited as indicative of a widening gap between civil society and liberal democracy. Opinion polls register expressions of support for political action. Although such expressions are not the same thing as taking political action, the results nevertheless raise a question: If citizens of both societies believe, as the results indicate, that the United States and Japan should act immediately on the problem of global warming, why hasn’t state power been marshaled in 2 years of negotiations to support immediate action? A contradiction is evident not only in the exercise of state power but also in that of civil society. If the polls correctly depict the values of these societies, how can their members justify the apparent contradiction that the typical U.S. lifestyle depends on per capita emissions of CO₂ that are the largest in the world and Japan’s lifestyle is founded on an emissions stream that is the fourth largest (World Resources Institute, 1996)? In essence, why haven’t citizens exercised their civil responsibility and power to change the fact that their economic structures and lifestyles depend upon massive CO₂ dumping into the atmosphere?

One explanation for the disjuncture between political expression and political action in liberal democracies can be traced to a larger problem of discursive conflicts (Figure 1). Specifically, it is increasingly evident that the *discourse of power* controlled by the state and industry in liberalist societies has preempted the *discourse of political expression* exercised by civil society. The discourse of power in liberal societies embraces a corporatist ideology in which society and state are expected to operate in service to capital and technology. In this ideology, it is believed that the welfare of society depends on the “welfare” of capital and technology. Contemporarily, nature has been brought into this equation as alarming losses of species, vanishing habitats, and overconsumption of resources have led to a fear of “the end of nature” (McKibben, 1989). In response to these environmental alarms, the need for a “capitalization” of nature itself is being propounded in which the state and its corporate allies assume responsibility for the “protection of the natural environment” (Escobar, 1996; M. O’Connor, 1994).

With the loss of social agency to “autonomous” capital and technology (Winner, 1992), and with a growing realization of the loss of our place in nature, again as an outgrowth of autonomous capital and technology, civil society in liberal democracies has fractionated. The alienation of modernity has reduced daily life for many in countries like the United States and Japan to a mostly passive existence involving end-

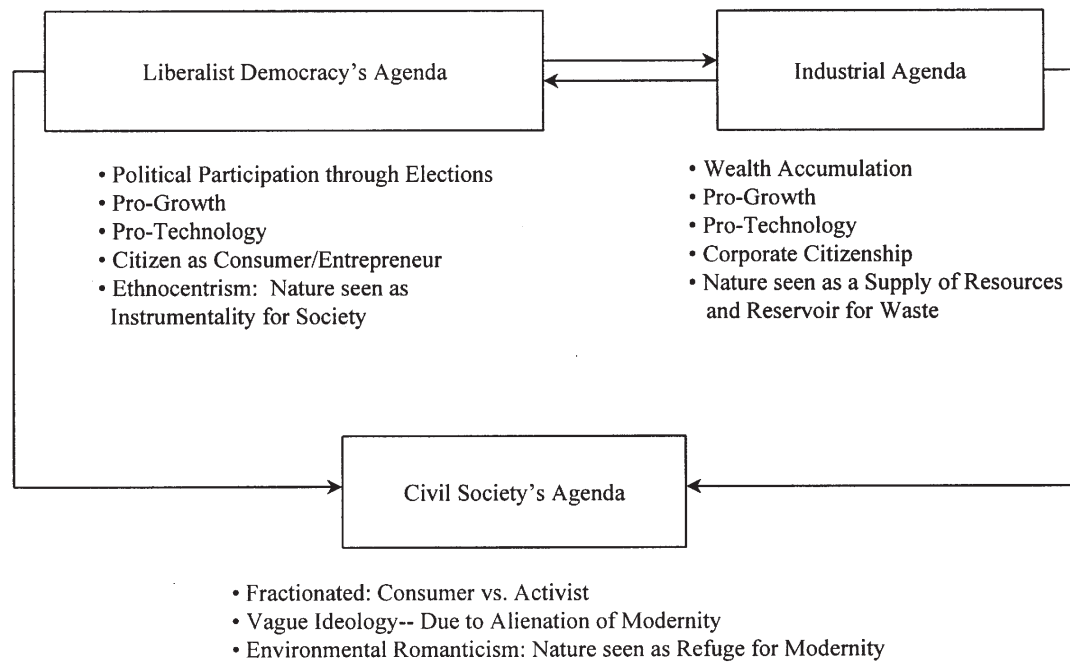


Figure 1. The Disjuncture of Liberalist Discourses on the Environment

less episodes of expression (from the political to the fashionable, often with little to distinguish them—see Gare, 1995) that are typically resolved, or at least completed, with consumption. Civil society has been marginalized by what Mumford described in 1964 as the discourse of “democratic authoritarianism.”

Under the democratic-authoritarian social contract, each member of the community may claim every material advantage, every intellectual and emotional stimulus he may desire, in quantities hardly available hitherto even for a restricted minority: food, housing, swift transportation, instantaneous communication, medical care, entertainment, education. But on one condition: that one must not merely ask for nothing that the system does not provide, but likewise agree to take everything offered, duly processed and fabricated, homogenized and equalized, in the precise quantities that the system, rather than the person, requires. (p. 6)

Alongside this fractured civil identity of liberalist democracy has emerged a more hopeful response to the alienation of modernity—that of grassroots activ-

ism to challenge the bargain of democratic authoritarianism. This discourse, however, has yet to realize forms of communication and collective action that address the problems of often conflicting class, cultural, racial, and gender standpoints. Environmentalism as a movement has been frequently discombobulated by such conflicts. Thus, the geography of hazardous facilities in the United States is race- and class-based (Bullard, 1980, 1998; Byrne, Hoffman, & Martinez, 1992; Foster, 1998; Novotny, 1998). Nuclear power plants that cannot be sold in developed countries because of effective environmental protest are marketed to developing countries with the active assistance of the democratic states. Toxic waste moves from developed countries, where regulatory standards are high, to developing countries, as states and corporate interests on both sides of the development divide align in support of patterns of uneven and “combined” development (J. O’Connor, 1989). Globally, this has led to the frequent result of “environmental success” in the United States, Japan, or Europe, corresponding to environmental colonization of Southern cultures, people, and lands (Agarwal & Narain, 1993).

With civil society in disarray just as their liberalist state and corporate institutions are connecting to the

new information and transactional platforms of global technology, political discourse in the liberal democratic orbit seems destined to become even more riddled with contradictions. Citizens have little to do with the direction of their societies: Civil discourse and action are confined largely to realms of expression and consumption. The almost entirely artificial character of liberalist democratic life has brought its citizens to the gradual recognition that the *state of nature* is passing away, to be replaced by the *state of commerce* as the context of virtual life.

This has become disturbing to some members of these societies (perhaps a majority, if the earlier cited polls are accurate). Nature has been widely romanticized in the United States, Japan, and Europe in the 20th century as the antidote to the alienation of modernity. "At one with nature" is a shared utopian vision of many in liberal societies. The debate over whether and what to do about climate change exhibits the socio-political contradictions created by the triumph of the state of commerce in these societies and the coincident demise of a civil society able to check corporate power.

The Contradiction of Liberalist Ideas of Efficiency and Equality

The 1997 Kyoto negotiations on global warming exposed the absence of a commitment among wealthy nations to act on this threat in a manner that recognized ecological limits. Interestingly, the United Nations had sponsored an international science panel—the Intergovernmental Panel on Climate Change (IPCC)—to identify the limit on GHG emissions needed to avert global warming. This body set the global emissions limit at a level 60% below 1990 world emissions (Intergovernmental Panel on Climate Change, 1992, 1996) and indicated that a 20% reduction from 1990 levels would be needed by 2005 if climate stability is to be realized by the mid-21st century. Yet only the Alliance of Small Island States (AOSIS) and international environmental nongovernmental groups (NGOs) championed the IPCC target at Kyoto. The signed protocol calls for a much lower reduction and delays the timing for action—a 5% reduction compared to 1990 levels was agreed to, and it is to be realized between 2008 and 2012 (see Article 3 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1997).

How can the failure among liberal democracies to embrace a sustainability criterion be explained? Obvi-

ously, there are entrenched economic interests in the United States, Japan, and Europe whose wealth and power are threatened by the exercise of such a criterion. But at least since the Club of Rome, there has been evidence of a significant corporate interest in the management of environmental resources (see, e.g., Escobar, 1996; Golub & Townsend, 1977), and certainly some versions of a sustainability criterion can be concluded to be consonant with capitalist development aims (Redclift, 1984). Thus, it would be oversimplifying to argue that the neglect of a sustainability criterion is entirely due to corporate interest.

Beyond the expected opposition from at least some sectors of industry, there is a deep-rooted problem in the type of democracy celebrated by liberal societies, especially with regard to relations with the natural world. The foundational principles of contemporary liberal democracy were born in an era when emancipation meant freedom from not only political tyranny but also natural constraint. Indeed, the salient question to 17th- through 19th-century architects of the new democratic society in thinking about nature was its conquest—the transformation of a stingy nature to a productive contributor to the majestic aims of an egalitarian society able to feed, clothe, and house all people. As Sheldon Wolin (1960) observes in his brilliant critique of the new democracy, liberalism in the West sought to harness what it believed to be the liberating forces of science, technology, markets, and democracy to defeat the old dynastic-feudal regimes and conquer the natural order. Releasing humanity from the chains of the old political, economic, intellectual, and cultural hierarchies was seen as the enterprise of science, technology, and market economy. But these forces were also to be directed to the transformation of nature into a tool for use in building a future of not only liberty but also material happiness for all. The liberating function of politics was to be situated, under liberalism, in the act of sweeping away all resistance—human and natural—to the new ideas, values, and purposes of science, technology, and market economy. From Locke (1698/1976) and Smith (1776/1915), to Condorcet (1793/1994), Saint-Simon (1802-1813/1975), and Franklin (1725/1930), hope was sought in a political order that would free the new productive forces that would actually make it possible to realize the long-promised egalitarian dream of democracy (in addition to Wolin, 1960, see also Kumar, 1978, 1995).

This view led liberalism to conceive the productivity of science, technology, and economics as the alter ego of equality: One could only be gained with the

other. Environmental negotiations—like those of trade (General Agreement on Tariffs and Trade)—have consistently been viewed by liberal democracies as the art of guiding the productive forces of science, technology, and economics to achieve equitable (or, at least, reasonable) results. For an ideology that understood the natural world as unreasonable and unproductive (see, especially, Merchant's discussion in her 1980 volume of the mechanistic turn in Western thinking about nature), the conquest of nature meant the application of rational, productive thinking to the inspiring goal of material plenty for everyone.

Thus, it cannot be surprising that liberalism would be blind to the idea of sustainability when it means that the natural order should somehow be consulted to set limits on social futures. Simply put, such thinking for liberalism would be irrational. And ultimately, liberalism would anticipate that such a policy would halt progress toward equality.

The Kyoto negotiations, and subsequent developments at Buenos Aires, followed the liberal script on this score. Negotiators from the United States, Europe, and Japan have focused on so-called flexibility mechanisms of emissions trading, joint implementation, and a clean development mechanism as essential tools for organizing a global response to the prospect of climate change. Ultimately, these mechanisms conceive climate change as a productivity problem: In essence, existing technology and market arrangements are believed to inefficiently use the atmosphere to dump GHG emissions; with proper market signals and with a concerted scientific effort, an efficient regime of atmospheric use will be found that allows the productive forces of modernity to resume the quest for an egalitarian future.

Although some members of the European Community have insisted that limits should be placed on the use of such mechanisms to meet emission targets, the setting of emission targets themselves has ignored sustainability questions so far. Even limiting the use of flexibility mechanisms, so that the treaty avoids becoming little more than a pact to redistribute the sources of emissions, has failed to occur.

Thus, the preoccupation with efficiency mechanisms, at the risk of unsustainability is expectable. The policies championed by the liberal democracies at Kyoto and Buenos Aires are a continuation of liberalism's formula—to exploit the *state of nature* to improve the *state of commerce* to achieve an egalitarian order. This formula is traceable to liberalism's effort to effect a peculiar alliance of efficiency and

equality. Such an alliance, by definition, ignores the underlying ecological contradiction of its formula for progress. It also yields a construct of equality largely shorn of common ethical expectations of what the term should mean. Although historically and currently the developed countries have overused the atmosphere as a CO₂ dump (see Byrne et al., 1994), the Kyoto flexibility mechanisms permit the wealthy countries to avoid domestic reductions in their emissions by paying the Third World to reduce theirs. An ethically novel equality will ensue in which those who have benefited from centuries of ecologically reckless behavior will be relieved of responsibility by paying the Third World to imitate the Western progress formula, but more efficiently.

In the name of efficiency, developed nations are licensed under the Kyoto Protocol to acquire cheap opportunities to reduce global emissions today, leaving it to the developing world to undertake the more costly conversions later in the new century (Lynch, 1998, p. 17). Indeed, when the developing world seeks to reduce emissions in 20 years, the low-cost opportunities within their domestic economic structures will already have been purchased by the wealthy countries—locking the South in a new dependency for its development under Northern management (Agarwal & Narain, 1997). In sum, the Kyoto flexibility mechanisms, founded on liberalism's associations of progress with productivity and equality with cornucopia, create climate markets controlled by polluters, a result that will accentuate, rather than reverse, the unsustainable and unequal state of nature of modernity.

“Democratic” Capitalization of Nature: Elite-Centered Global Management

The current international discourse on climate change is leading the way in rendering natural processes—not simply resources found in nature—as phenomena subject to global management. The capture of core processes of the natural order, such as the carbon cycle, in the languages of scientific and economic laws clears the way for policy regimes that intend to choose the state of nature wanted by society, or at least its elites. The environment becomes an object for scientific and economic design.

This approach to the environment, as argued above, is enshrined in the ideology of liberal democracy. The political ethos to “manage environmental resources to ensure sustainable human progress and human survival” (World Commission on Environment and

Development, 1987, p. 1) derives from the belief that science, technology, and economics lift society from the constraint of nature, providing it with powers and rights over nature's design. Environmentalism is a form of managerialism in the era of liberal democracy. Technical and organizational intelligence is concentrated on increasing the productivity of nature. As Sachs (1993) argues, modernity is based on the exploitation of nature (human and physical) through the collaboration of dominant actors in government, the economy, and the sciences. Indeed, as Mumford (1964) noted years ago, the agreement of these three institutional elements on the direction and purposes of society has provided the very definition of what constitutes a democratic consensus in the West since industrialization.

Management of nature requires global economic, bureaucratic, and technological organization. Elites who control capital, technologies, and information are the only interests, practically speaking, who could aspire to the role of global manager. As theorists of liberal democracy have consistently argued, elite power is not in itself inimical to democracy (see Bentley, 1949; Dahl, 1961; Walker, 1966). The issue is whether such power is accountable to a democratic consensus. When, in turn, democratic consensus for political action is to be sought in a system of checks and balances among government, industry, and science interests, the era of "managed nature" is surely upon us.

Under an emergent regime of managed nature, the global atmosphere is fast becoming, alternatively, an ecological laboratory and bank, cared for by scientific experts and financial managers. The sustainability interest of liberal democracy in this era is to protect environmental capital for future generations, not the regenerative capacities of the natural environment. This new form of capital is to be managed in the public and scientific interest for future exploitation. In this specific sense, liberal democracy's interest is in the capitalization of nature, rather than its protection *per se*.

Conclusion

Global negotiations on climate change expose three contradictions of liberal democracy. First, although civil society is acclaimed in liberalism as the root of democratic life, state and corporate power are in reality overwhelmingly greater in liberal democracies. The power of civil society is largely confined to expressions of protest and refusals to consume "in the precise quantities that the system requires" (Mumford,

1964, p. 6). Such exercises of power are eclipsed by those of corporate and state interests. Thus, civil society shouts from the sidelines as the actual representatives of liberal democracy play by their own rules.

The 17th- through 19th-century architects of liberal democracy placed their political hopes in an alliance with science and economics to produce an egalitarian society. The cornucopian potential of the new science and economics was seen as paving the way for a democracy of liberty and material happiness. Nature in the liberal democratic era has been transformed from an irreducible source of life to a factor of production to be harnessed on behalf of this cornucopian vision of material plenty for all. This has left liberal democracy with little more than a utilitarian interest in nature. The appearance of global environmental threats such as climate change, which directly challenge that utilitarian interest, reveal the underlying ecological contradiction of cornucopian egalitarianism. The pursuit of Kyoto flexibility mechanisms to respond to climate change represents efforts of liberal democracy to resituate the discourse in terms that are acceptable to its ideology. Liberal democracy cannot be expected to champion a policy regime of explicit ecological limits or explicit economic limits on its accumulation of wealth. Both are anathema to one of its foundational principles—the exploitation of the state of nature to improve the state of commerce to achieve an egalitarian society.

Finally, the challenge of global environmental crises like climate change has caused the emergence of a new interest of liberal democracy—the capitalization of nature. To be distinguished from simply profiting by the extraction and use of nature's "free" resources, the capitalization of nature represents the effort to turn nature in the systemic sense to the design purposes of modern society. Liberal democracy is seeking to resolve global environmental dilemmas that spring from the contradictions of its own development by reconstructing them as problems of inefficiency and poor management. Urged on by liberal democracies, climate change negotiations are in search of an ideal of managed nature to be delivered by the languages of science and economics. Proposals for emissions trading, joint implementation, and a clean development mechanism are representative of this search. When realized, the semiotic conquest of nature by science and economics will make possible a policy regime that can confidently promise an ecological oxymoron—efficient global warming.

References

- Agarwal, A., & Narain, S. (1993). *Global warming in an unequal world: A case of environmental colonialism*. New Delhi, India: Center for Science and the Environment.
- Agarwal, A., & Narain, S. (1997). Joint implementation needs to consider needs of developing countries. Weathervane (Web site of Resources for the Future). Available: <http://www.weather-vane.rff.org/pop/pop2/II-india.html>.
- Bentley, A. F. (1949). *The process of government*. Evanston, IL: Principia.
- Bullard, R. D. (1980). *Dumping in Dixie: Race, class and environmental quality*. Boulder, CO: Westview.
- Bullard, R. D. (1998). Anatomy of environmental racism and the environmental justice movements. In J. S. Dryzek & D. Schlosberg (Eds.), *Debating the earth: The environmental politics reader* (pp. 471-492). Oxford, UK: Oxford University Press.
- Byrne, J., Hadjilambrinos, C., & Wagle, S. (1994). Distributing costs of global climate change. *IEEE Technology and Society*, 13 (Spring), 17-26, 32.
- Byrne, J., Hoffman, S. M., & Martinez, C. R. (1992). *Environmental commodification and the industrialization of Native American lands*. Paper presented at the Proceedings of the 7th Annual Technological Literacy Conference, National Association of Science, Technology and Society, Alexandria, VA, 170-181.
- Condorcet, J.-A.-N. de C. (1994). *A general survey of science—Concerning the application of calculus to the political and moral science*. In I. McLean & F. Hewitt (Trans. and Eds.), *Condorcet: Foundations of social choice and political theory* (pp. 93-110). Brookfield, VT: Edward Elgar. (Original work published 1793)
- Dahl, R. A. (1961). *Who governs? Democracy and power in American society*. New Haven, CT: Yale University Press.
- Dryzek, J. (1998). Political and ecological communication. In J. S. Dryzek & D. Schlosberg (Eds.), *Debating the earth: The environmental politics reader* (pp. 584-598). Oxford, UK: Oxford University Press.
- Escobar, A. (1996). Constructing nature: Elements for a poststructural political ecology. In R. Peet & M. Watts (Eds.), *Liberation ecologies: Environment, development, social movement* (pp. 46-68). New York: Routledge.
- Foster, J. B. (1998). The limits of environmentalism without class: Lessons from the ancient forest struggle in the Pacific Northwest. In D. J. Gaber (Ed.), *The struggle for ecological democracy: Environmental justice movements in the United States* (pp. 93-110). New York: Guilford.
- Franklin, B. (1930). A dissertation on liberty and necessity, pleasure and pain (L. C. Worth, Ed.). New York: Facsimile Text Society Edition. (Original work published 1725)
- Gare, A. E. (1995). *Postmodernism and the environmental crisis*. New York: Routledge: 4-35, 164-169.
- Golub, R., & Townsend, J. (1977). Malthus, multinationals and the Club of Rome. *Social Studies of Science*, 7, 201-222.
- Intergovernmental Panel on Climate Change. (1992). *Climate change 1992: The supplementary report to the IPCC scientific assessment*, J. T. Houghton, B. A. Callander, & S. K. Varney (Eds.). New York: Cambridge University Press.
- Intergovernmental Panel on Climate Change. (1996). *Climate change 1995: Economic and social dimensions of climate change*, J. P. Bruce, H. Lee, & E. F. Haites (Eds.). New York: Cambridge University Press.
- International Press Service. (1998). Environment-U.S.: Poll finds support for Kyoto treaty. Available: http://www.one-world.org/ips2/nov98/04.32_008.html.
- Kumar, K. (1978). *Prophecy and progress: The sociology of industrial and post-industrial society*. New York: Penguin.
- Kumar, K. (1995). *Post-industrial and post-modernism society: New theories of the contemporary world*. Oxford, UK: Blackwell.
- Locke, J. (1976). *The spirit of John Locke on civil government*. New Haven, CT: Research Institute Publications. (Original work published 1698)
- Lynch, C. (1998). Stormy weather. *Amicus Journal*, 19(4), 15-19.
- McKibben, W. (1989). *The end of nature*. New York: Random House.
- Merchant, C. (1980). *The death of nature: Women, ecology, and the scientific revolution*. San Francisco: Harper & Row.
- Mumford, L. (1964). Authoritarian and democratic technics. *Technology and Culture*, 5, 1-8.
- Novotny, P. (1998). Popular epidemiology and the struggle for community health in the environmental justice movements. In D. J. Gaber (Ed.), *The struggle for ecological democracy: Environmental justice movements in the United States* (pp. 137-158). New York: Guilford.
- O'Connor, J. (1989). Is sustainable capitalism possible? In M. O'Connor (Ed.), *Is capitalism sustainable? Political economy and the politics of ecology* (pp. 152-175). New York: Guilford.
- O'Connor, M. (1994). Codependency and interdeterminacy. In M. O'Connor (Ed.), *Is capitalism sustainable? Political economy and the politics of ecology* (pp. 53-75). New York: Guilford.
- Public backs tough steps for a treaty on warming. (1997, November 28). *The New York Times*.
- Public opinion survey in Japan. (1997, June 21). *Asahi Shimbun*.
- Redclift, M. (1984). *Development and the environmental crisis: Red or green alternatives?* New York: Methuen.
- Sachs, W. (1993). Global ecology and the shadow of development. In W. Sachs (Ed.), *Global ecology: A new arena of political conflict* (pp. 3-21). Atlantic Highlands, NJ: Zed Books.
- Saint-Simon, H. (1975). Selected writings on science, industry and social organization. In K. Taylor (Trans. and Ed.), *Henri Saint-Simon (1760-1825): Selected writings on science, industry and social organization*. London: Penguin. (Original works published 1802-1813)
- Smith, A. (1915). *The wealth of nations*. London: Dent & Sons. (Original work published 1776)
- United Nations Framework Convention on Climate Change. (1997). *Kyoto protocol to the United Nations Framework Convention on Climate Change*. Available: <http://www.unfccc.de/resource/docs/cop3/107a01>.
- U.S. Environmental Protection Agency. (1998). The Kyoto Protocol and the president's policies to address climate change. Available: http://www.epa.gov/globalwarming/reports/pubs/wh_econ/index.html.
- U.S. Senate. (1997). Senate resolution 98 (Calendar No. 120, Report No. 105-54). Washington, DC: U.S. Congressional Record. Available: <http://thomas.loc.gov/cgi-bin/query/D?c105:23:/temp/~c105ObtLS1::>
- Walker, J. L. (1966). A critique of the elitist theory of democracy. *American Political Science Review*, 60, 285-295.

- Winner, L. (1992). Introduction. In L. Winner (Ed.), *Democracy in a technological society* (pp. 1-11). Boston: Kulwer Academic.
- Wolin, S. S. (1960). *Politics and vision: Continuity and innovation in Western political thought*. Boston: Little, Brown.
- World Commission on Environment and Development. (1987). *Our common future*. New York: Oxford University Press.
- World Resources Institute. (1996). *World resources 1996-97*. Oxford, UK: Oxford University Press.

John Byrne is director and professor of the Center for Energy and Environmental Policy, University of Delaware. He is a contributing author to the Second Assessment Report (1996) of the Intergovernmental Panel on Climate Change.

He serves as coexecutive director of the Joint Institute for Sustainable Energy and Environmental Future, headquartered in Seoul, Korea. He has published 10 books and more than 100 articles on energy and environmental policy.

Sun-Jin Yun is a Ph.D. candidate and research associate at the Center for Energy and Environmental Policy, University of Delaware. She is also a research associate for the Joint Institute for Sustainable Energy and Environmental Future.