

ARTICLES

Introduction: Climate Change and Consumption

by Douglas A. Kysar and Michael P. Vandenbergh

Will the response to climate change require environmental lawyers and policymakers to finally confront limits on material consumption by individuals and households? The Articles in this issue are the product of an April 2008 Climate Change and Consumption Conference that addressed this question.¹ In the last several years, numerous scholarly books, articles, and conferences in the natural and social sciences have focused on consumption and the environment.² Yet, only a handful of law review articles in the United States have directed sustained attention toward this issue, and none have focused on the nexus between climate change and consumption.³

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1. The Climate Change and Consumption Conference was held at Vanderbilt University Law School and was sponsored by the Vanderbilt Regulatory Program, the Climate Change Research Network, the Vanderbilt Center for the Study of Religion and Culture, the Vanderbilt Center for Environmental Management Studies, the Environmental Law Institute, and the American Council for an Energy Efficient Economy.
2. See, e.g., JAMES GUSTAVE SPETH, *THE BRIDGE AT THE EDGE OF THE WORLD* (2008); *CONFRONTING CONSUMPTION* (Thomas Princen et al. eds., 2002); *ETHICS OF CONSUMPTION: THE GOOD LIFE, JUSTICE, AND GLOBAL STEWARDSHIP* (David A. Crocker & Toby Linden eds., 1998); ALAN DURNING, *HOW MUCH IS ENOUGH? THE CONSUMER SOCIETY AND THE FUTURE OF THE EARTH* (1992); Edgar Hertwig, *Consumption and Industrial Ecology*, *J. INDUS. ECOLOGY*, Winter/Spring 2005, at 1. For an example of a recent conference, see Research Committee 24 on Environment and Society, International Sociological Association, and Department of Rural Sociology, University of Wisconsin-Madison, *Sustainable Consumption and Society: An International Working Conference for Social Scientists* (June 2-3, 2006), at <http://www.michaelmbell.net/suscon-program.htm>.
3. For example, as of 1997, James Salzman concluded that no law review article had been written on the environmental impacts of consumption. See James Salzman, *Sustainable Consumption and the Law*, 27 *ENVTL. L.* 1243, 1248 (1997). Subsequent contributions have included Albert C. Lin, *Virtual Consumption: A Second Life for Earth?*, 2008 *B.Y.U. L. REV.* 47 (2008); Bradley A. Harsch, *Consumerism and Environmental Policy: Moving Past Consumer Culture*, 26 *ECOLOGY L.Q.* 543 (1999); Michael P. Vandenbergh, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Law*, 57 *VAND. L. REV.* 515 (2004); Mona L. Hymel, *Consumerism, Advertising, and the Role of Tax Policy*, 20 *VA. TAX REV.* 347 (2000). It should come as no surprise that environmental lawyers and policymakers rarely wrestle with consumption: private, decentralized determination of aggregate amounts and patterns of consumption is a concept fundamental to the social, economic, and legal fabric. The emergence of climate change is the grandfather of all externality problems, however, and may provide theoretical justification for far-ranging regulatory intervention into

The Climate Change and Consumption Conference began the process of filling this gap by bringing legal scholars to the table with social scientists, philosophers, environmental engineers, and natural scientists. The Articles in this issue are the result. They do not provide a uniform answer to the question, but they present views from a remarkably broad set of disciplinary perspectives. They begin what we hope will be a vibrant debate by academicians and policymakers at the global, federal, state, and local levels regarding the role of consumption as a driver of climate change and as a potential site of regulatory response.

The Articles in this issue speak for themselves. In this introduction, we simply put the Articles in context by providing a brief overview of the (limited) role consumption has played in environmental law and policy thus far, examining the characteristics of greenhouse gas (GHG) emissions, and exploring various conceptions of consumption and the consumer. Although environmental problems are the product of the demand for and supply of energy and other goods and services, the dominant response to date has been to assume that demand will grow and to focus instead on reducing the amount of environmental harm per unit supplied.⁴ We suggest that the characteristics of GHG emissions will make this approach difficult, if not impossible, if the goal is to reduce the risk of catastrophic climate change. In fact, the response to climate change already may be generating an implicit focus on consumption. We hope that the explicit debate about consumption in the Articles in this issue ultimately will lead not only to a broader examination by academicians and policymakers, but also to more effective, lower cost legal measures to address climate change and other environmental problems.

I. The Role of Consumption in Environmental Law and Policy

Although academic critiques of consumption date at least to Thorstein Veblen's 1899 critique of "conspicuous consumption," scholar and policymaker interest in the environmental impacts of consumption has ebbed and flowed over the last

markets, even from within a narrow welfare economic understanding of appropriate government activity.

4. For example, an article about a recent G-8 meeting assumes development of additional electric-generating nuclear reactors may be necessary because of "growing demand for electricity" without asking whether growth in electricity demand is necessary or preferable to the alternative. *G8 Split on Nuclear Energy, Climate Change Issues*, CNN.com (July 16, 2006), <http://www.cnn.com/2006/WORLD/eurpoe/07/16/Russia/g8.energy.reut/index.html>.

40 years.⁵ In the period from the 1960s through the early 1970s, the first sustained academic discussion began. Vanderbilt University economics professor Nicholas Georgescu-Roegen, a physicist by training, wrote in the 1960s about the implications of the Second Law of Thermodynamics (entropy) for economics.⁶ Kenneth Boulding, a past president of the American Economic Association, asserted in 1966 that economists should account for the ability of humans to reach the carrying capacity of the earth.⁷ In the early 1970s, Herman Daly, a student of Georgescu-Roegen, advocated development of a steady-state economy.⁸ Among environmental scientists, the $I = PAT$ formula advanced by Barry Commoner, Paul Ehrlich, John Holdren, and others highlighted the importance of consumption.⁹ Although the work of the ecological economists was more ignored than debated by other economists,¹⁰ the work of the environmental scientists provoked fierce debates, including the infamous wager between Ehrlich and the economist Julian Simon, which purportedly “tested” their competing views on the likelihood of resource scarcities.¹¹

In the policy realm, environmental social movements during this period asserted that “small is beautiful” and linked environmentalism with rejection of materialism.¹² Early international pronouncements such as the Club of Rome’s 1972 report *Limits to Growth* noted the relationship between consumption and environmental degradation as part of an overall revival of concerns raised by English political economist Thomas Malthus regarding the viability of an

expanding human footprint on the planet.¹³ Statutory requirements for reductions in consumption are conspicuously absent from the principal environmental laws of the early 1970s, however, and with the important exception of energy efficiency measures adopted during the energy crisis in the late 1970s, few legal or policy initiatives targeted at consumption reduction were adopted in the following decade. Certainly, the drafters of environmental laws often steered clear of mandates that would have limited the amounts of production or consumption of goods, or of the wastes produced, even while they imposed strict waste treatment and emissions standards.¹⁴

Courts also have been reluctant to scrutinize too carefully the links between consumption and environmental problems. Although courts frequently engage in the second-guessing of consumer transactions based on claims of fraud, misrepresentation, failure to warn, or product defectiveness, they are far more reluctant, and have fewer available tools, to question the relationship between acts of consumption and upstream or downstream environmental effects. Similarly, during the last energy crisis the U.S. Supreme Court declined to require a federal agency to consider the option of reducing electricity demand rather than increasing supply through nuclear power. In rejecting a National Environmental Policy Act (NEPA) challenge based on the Atomic Energy Commission’s failure to consider energy conservation in an environmental impact statement (EIS), then-Justice William H. Rehnquist wrote in *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*¹⁵ that requesting an agency to evaluate electricity demand reduction through energy conservation in the late 1960s and early 1970s was “an exploration of uncharted territory” and was “peripheral” to a decision on the adequacy of an EIS for a nuclear power plant.¹⁶

Justice Rehnquist noted in *Vermont Yankee* that “[t]ime may prove wrong the decision to develop nuclear energy, but it is Congress or the States within their appropriate agencies which must eventually make that judgment.”¹⁷ Our point is not that nuclear power was a good or bad choice in the 1970s, but that it is unclear whether Congress, the states, or agencies ever seriously weighed reducing energy consumption as an alternative. Did a meaningful political debate ever take place at the national or state level during this period? Or did policymakers essentially assume increasing levels of energy demand and assume that their role was to minimize the environmental harms from supplying that demand?¹⁸

5. THORSTEIN VEBLEN, *THE THEORY OF THE LEISURE CLASS* (1899). For further work in this vein, see JAMES S. DUESENBERY, *INCOME, SAVING AND THE THEORY OF CONSUMER BEHAVIOR* (1949); FRED HIRSCH, *SOCIAL LIMITS TO GROWTH* (2d ed. 1999); H. Leibenstein, *Bandwagon, Snob, and Veblen Effects in the Theory of Consumers' Demand*, 64 Q. J. ECON. 183, 190-99 (1950); ROBERT H. FRANK, *LUXURY FEVER* (1999); Robert H. Frank, *The Demand for Unobservable and Other Nonpositional Goods*, 75 AM. ECON. REV. 101 (1985).

6. See generally Douglas Kysar, *Climate Change, Cultural Transformation, and Comprehensive Rationality*, 31 B.C. ENVTL. AFF. L. REV. 1, 9 (2004) (providing overview of the development of environmental economics). Georgescu-Roegen outlined his ideas in an essay that predates his 1971 book. See NICHOLAS GEORGESCU-ROEGEN, *THE ENTROPY LAW AND THE ECONOMIC PROCESS* (1971). Georgescu-Roegen’s essay formed part of the basis for Paul Samuelson’s 1965 *Analytical Economics* preface in which he referred to Georgescu-Roegen as a “scholar’s scholar, an economists’ economist.” See Herman Daly, *On Nicholas Georgescu-Roegen’s Contributions to Economics: An Obituary Essay*, 13 ECOLOGICAL ECON. 149, 150 (1995) (citing Paul Samuelson, *Preface* to NICHOLAS GEORGESCU-ROEGEN, *ANALYTICAL ECONOMICS* (1966)).

7. See Kysar, *supra* note 6, at 9 (citing Kenneth Boulding, *The Economics of the Coming Spaceship Earth*, reprinted in *VALUING THE EARTH: ECONOMICS, ECOLOGY, ETHICS* 297 (Herman E. Daly & Kenneth N. Townsend eds., 1993)).

8. See *TOWARD A STEADY-STATE ECONOMY* (Herman E. Daly ed., 1973).

9. For a discussion of the $I = PAT$ formula and its limitations, see MICHAEL BROWER, *THE MACARTHUR FOUNDATION INITIATIVE ON POPULATION, CONSUMPTION, AND THE ENVIRONMENT* 1-4 (1997).

10. See Daly, *supra* note 8.

11. See, e.g., *id.* at 4 (citing ESTER BOSERUP, *THE CONDITIONS OF AGRICULTURAL GROWTH: THE ECONOMICS OF AGRARIAN CHANGE UNDER POPULATION PRESSURE* (1965)). For discussion of the Ehrlich-Simon wager, see Douglas A. Kysar, *Some Realism About Environmental Skepticism*, 30 ECOLOGY L.Q. 223 (2003).

12. See, e.g., E.F. SCHUMACHER, *SMALL IS BEAUTIFUL: ECONOMICS AS IF PEOPLE MATTERED* (1973).

13. *THE CLUB OF ROME, LIMITS TO GROWTH* (1972); CHARLES REICH, *THE GREENING OF AMERICA* (1970).

14. See, e.g., Resource Conservation and Recovery Act, 42 U.S.C. §§6901-6992k, ELR STAT. RCRA §§1001-11011 (providing for comprehensive “cradle-to-grave” waste management standards and reporting requirements without imposing quantitative limits on waste generation). Emissions standards and waste treatment and disposal standards typically are hard, enforceable requirements. Waste reduction standards typically are soft, aspirational targets.

15. 435 U.S. 519, 8 ELR 20288 (1979).

16. *Id.* at 558.

17. *Id.*

18. To some extent this debate does appear to have occurred in California, and per capita electricity consumption in California is roughly the same today as in 1970, while national per capita electricity consumption has increased substantially. PACIFIC GAS & ELEC. CO., CALIFORNIA STATEWIDE RESIDENTIAL SECTOR ENERGY EFFI-

The late 1980s and early 1990s was a period of increased attention to the environmental impacts of consumption among international policymakers.¹⁹ The Brundtland Commission's adoption of sustainable development as a global goal in 1987 called attention to the issue as part of its effort to harmonize goals of economic development and environmental protection within a single conceptual framework.²⁰ Five years later, Agenda 21, which emerged from the Rio Conference, also addressed consumption through the lens of sustainable development, notwithstanding President George H.W. Bush's widely reported comment to the Rio Conference that "the American way of life is not up for negotiation."²¹ More recently, the Plan of Implementation of the 2002 World Summit on Sustainable Development in Johannesburg directly identified "changing unsustainable patterns of production and consumption" as an "overarching objective[] of, and essential requirement[] for, sustainable development."²² Although the sustainable development concept turns out to be far more complicated and contestable than its near-universal affirmation might suggest, at the core of the concept is a desire for economic development and environmental protection to be treated as equal and integrated goals, rather than as competitive concerns to be "traded off."²³ For many proponents of the concept, ample room for such harmonization would be opened by abandoning the idea that consumption is a category beyond questioning.

The international developments were accompanied by domestic consensus-building efforts²⁴ and renewed academic attention to issues of consumption and sustainable development.²⁵ Popular books directed at changing aggregate levels or patterns of consumption proliferated.²⁶ Organizations such as Redefining Progress and the Center for the New American Dream advocated "voluntary simplicity"

and alternatives to traditional economic measures of success.²⁷ More confrontational questioning of consumption was waged by organizations such as Adbusters, promoters of the annual "Buy Nothing Day" and celebrators of parody ads, "billboard liberation," and other "culture-jamming" techniques.²⁸ Once again, however, the international pronouncements, academic research, and social movements had little effect on domestic environmental law. Instead, at the federal level, the executive and legislative branches became locked in a fierce struggle over maintaining the existing statutory framework.²⁹ To the extent that policymakers did address the environmental impacts of consumption, they tended to do so in the international trade context, where salient consumer concerns such as the impact of tuna harvesting on dolphins had the convenient feature of being addressable through policy tools that protected domestic producers.

In the late 2000s, several trends appear to be driving renewed interest in the environmental impacts of consumption. World population has grown to more than six billion, and although the rate of growth has slowed, projections suggest that population levels will not level off until they reach nine billion or more.³⁰ Rapid economic growth in China and India has created a growing recognition that consumption levels currently observed in industrialized countries may soon extend to hundreds of millions of additional people, increasing pressure not only on atmospheric carbon levels, but on fisheries and forests, as well as fossil fuel supplies and other nonrenewable natural resources.³¹ For example, discussion of "peak oil" has evolved from predictions about future petroleum depletion to debate over whether we have already crossed the threshold into permanently declining production—while global demand continues to increase dramatically.³²

CIENCY STUDY 2-1 (2003), available at <http://docs.cpub.ca.gov/published/REPORT/30114.PDF>.

19. See, e.g., A domestic example of this attention is the Pollution Prevention Act of 1990, Pub. L. No. 101-508, 104 Stat. 1388.
20. WORLD COMM'N ON ENV'T & DEV., OUR COMMON FUTURE 24 (1987) (U.N. Doc. A/42/427) (defining sustainable development to mean "meet[ing] the needs of the present without compromising the ability of future generations to meet their own needs").
21. See U.N. Conf. on Env't & Dev., Rio de Janeiro, Braz., June 3-14, 1992, *Agenda 21*, U.N. Doc. A/CONF.151/26 (Aug. 12, 1992).
22. U.N. DEP'T OF ECON. & SOCIAL AFFAIRS, DIV. OF SUSTAINABLE DEV., PLAN OF IMPLEMENTATION OF THE WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT 2 (2002), available at http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf.
23. See Douglas A. Kysar, *Sustainable Development and Private Global Governance*, 83 TEX. L. REV. 2109 (2005).
24. See, e.g., PRESIDENT'S COUNCIL ON SUSTAINABLE DEVELOPMENT, SUSTAINABLE AMERICA: A NEW CONSENSUS FOR PROSPERITY, OPPORTUNITY, AND A HEALTHY ENVIRONMENT FOR THE FUTURE (1996). In addition, following the Rio Conference, the White House directed the federal U.S. Environmental Protection Agency (EPA) and other departments to develop a statement on mitigation strategies for the negative effects of consumption. See Presidential Decision Directive, Policy on Global Population Issues (draft, June 1, 1994), available at http://www.fas.org/irp/offdocs/pdd_pop.htm.
25. See, e.g., Salzman, *supra* note 3; Daly, *supra* note 8.
26. See, e.g., ALAN T. DURNING, HOW MUCH IS ENOUGH?: THE CONSUMER SOCIETY AND THE FUTURE OF THE EARTH (1992); JULIET B. SCHOR, THE OVERWORKED AMERICAN: THE UNEXPECTED DECLINE OF LEISURE (1993); JULIET B. SCHOR, THE OVERSPENT AMERICAN: UPSCALING, DOWNSHIFTING, AND THE NEW CONSUMER (1998).
27. Duane Elgin promoted the voluntary simplicity concept in a 1981 book, VOLUNTARY SIMPLICITY: TOWARD A WAY OF LIFE THAT IS OUTWARDLY SIMPLE, INWARDLY RICH (1981), and in the succeeding years a number of nongovernmental organizations formed to promote related concepts. See, e.g., The Simple Living Network, *Homepage*, <http://www.simpleliving.net/main/> (listing eleven "partner" organizations).
28. See Tamara R. Piety, *Against Freedom of Commercial Expression*, 29 CARDOZO L. REV. 2583, 2665 (2008).
29. RICHARD LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 149-61 (2004).
30. See U.N. DEP'T OF ECON. & SOC. AFFAIRS, THE WORLD AT SIX BILLION 3-8 (1999) (U.N. Doc. ESA/P/WP.154), available at <http://www.un.org/esa/population/publications/sixbillion/sixbilpart1.pdf>.
31. Other issues that present global-scale concerns include the global depletion of fisheries (at least 70% of all fisheries are thought to be at or beyond their carrying capacity) and tropical deforestation (although forests in industrialized countries are stable or growing, tropical deforestation is occurring at a rapid rate). See, e.g., Michael P. Vandenberg, *The New Wal-Mart Effect: The Role of Private Contracting in Global Governance*, 54 UCLA L. REV. 913, 964-65 (2007); Martin Hickman, *Earth's Ecological Debt Crisis: Mankind's "Borrowing": From Nature Hits New Record*, INDEPENDENT (Online Edition), Oct. 9, 2006, <http://news.independent.co.uk/environment/article1822171.ece> (noting that "[t]he biggest problem relating to the over-consumption of resources is climate change, but its other effects include deforestation, falling agricultural yields and overfishing").
32. *The General Depletion Picture*, ASPO NEWSL. (Ass'n for the Study of Peak Oil & Gas, Ballydehob, Ir.), May 2008, at 2 (presenting long-term estimates of global oil production indicating that the peak occurred in 2007), available at http://www.aspo-ireland.org/contentFiles/newsletterPDFs/newsletter89_200805.pdf.

The growing concern about climate change also may be driving policymakers to look for alternatives to traditional pollution control measures, and the characteristics of GHG emissions suggest that a focus on consumption may be necessary. An emerging consensus suggests that 60-80% reductions in carbon emissions are required by 2050 to reduce the risk of catastrophic climate change,³³ but carbon emissions are nearly synonymous with economic activity, and they are remarkably hard to eliminate or sequester.³⁴ Facility-specific regulation, the dominant pollution control measure in much of the developed world, is difficult in part because the facilities that manufacture goods account for only roughly one-quarter of the total carbon emissions from production.³⁵ The remaining emissions arise from the supply chain, vast portions of which may be located abroad.³⁶ In addition, the carbon emissions that arise from the use of goods often swamp the emissions from their production.³⁷

33. See Michael P. Vandenbergh & Anne C. Steinemann, *The Carbon-Neutral Individual*, 82 N.Y.U. L. REV. 1673, 1686-87 (2007). Despite this emerging consensus, it bears noting that many knowledgeable scientists and policymakers would prefer a societal climate goal that is more directly stated in terms of maximum temperature increase or atmospheric GHG concentration levels. See, e.g., James Hansen et al., *Target Atmospheric CO₂: Where Should Humanity Aim?*, http://www.columbia.edu/~jeh1/2008/TargetCO2_20080407.pdf (last visited Oct. 15, 2008) (arguing, in light of new evidence and advances in understanding, for a global aim of reducing current concentrations from 385 ppm to 350 ppm “[i]f humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted”). Still others believe that emissions reduction targets, temperature goals, or concentration ceilings *all* should be secondary to a more concerted focus on the development of clean energy technologies. To these commentators, only dramatic breakthroughs in energy, transportation, and other infrastructural elements will provide the needed elimination of climate-impacting activities; thus, those breakthroughs should be directly sought through research and development investments, innovation incentives, and other policies.

34. See Vandenbergh & Steinemann, *supra* note 33, at 1724, n.242.

35. See H. Scott Matthews et al., *The Importance of Carbon Footprint Estimation Boundaries*, 42 ENVTL. SCI. TECH. 5839, 5839 (2008).

36. Michael P. Vandenbergh, *Climate Change: The China Problem*, 85 S. CAL. L. REV. (forthcoming 2008).

37. For example, if the average U.S. vehicle is used for 10 years and generates roughly 7,000 pounds (lbs.) of carbon dioxide (CO₂) equivalents per year, and if manufacturing of vehicles releases 10,000 lbs. of CO₂ equivalents, the use of the vehicle will generate roughly seven times as much CO₂ as it manufactures. Incidentally, this also explains why purchasing a newly manufactured hybrid electric vehicle may not actually be as “green” as enthusiastic consumers believe. As compared with a high-miles-per-gallon (mpg) older model vehicle such as a decidedly unglamorous Chevy Prizm salvaged from a junkyard it may take several years of operation for the new hybrid to offset its manufacturing emissions. Regardless of which shade of green their vehicle, however, drivers most obviously impact the climate simply by driving: A single gallon of gas, which weighs only about 6.3 lbs., generates 19.4 lbs. of CO₂ when burned. See U.S. EPA, EMISSIONS FACTS: AVERAGE CARBON DIOXIDE EMISSIONS RESULTING FROM GASOLINE AND DIESEL FUEL (2005) (EPA 420-F-05-001), *available at* <http://www.epa.gov/oms/climate/420f05001.htm>. For additional literature on this topic, see, e.g., MICHAEL BROWER & DAVID LEON, THE CONSUMER’S GUIDE TO EFFECTIVE ENVIRONMENTAL CHOICES 84 (citing U.S. DEPARTMENT OF COMMERCE, STATISTICAL ABSTRACT OF THE UNITED STATES 729, tbl. 1214 (1999)) (noting that “[t]he average floor area of a newly constructed single-family home grew almost 40% from 1970 to 1994”). Michael Brower and David Leon present a number of other statistics about consumption and lifestyle patterns in the United States. For example, they state that suburbanites average roughly 50% more vehicle miles of travel than urban residents. *Id.* at 87. They note that the fraction of light-duty trucks on the road in the United States (light-duty trucks average 20.5 mpg as compared to 28.5 mpg for cars) grew from 16.5% in 1980 to 40% in 1996. *Id.* at 90. They also note that a typical 17-foot motorboat uses twice as

If policymakers focus principally on reducing emissions from domestic industrial facilities, rather than the emissions from consumption by all sectors and by all major emitting countries, they will miss a large share of the total emissions.³⁸ Alternative energy sources are on the horizon, but large sources of low carbon energy may not be available until well beyond the points of no return identified by climate scientists. As Lesley McAllister, Jedediah Purdy, and James Salzman note in this issue, alternative fuels that are readily available in the near-term may generate rude surprises. Similarly, geo-engineering may be able to slow global warming in the near term, but it raises difficult governance issues and in the absence of carbon emissions reductions it is unlikely to slow ocean acidification in the long term.³⁹

In fact, the responses to climate change to date suggest that an implicit focus on consumption is already beginning to emerge. Recent federal legislation includes a combination of upstream and downstream cap-and-trade provisions along with allowance requirements for imports on account of international competitiveness concerns.⁴⁰ In combination, these provisions will function as implicit limits on consumption across many sectors. In the absence of an explicit discussion of growth in demand for energy and other forms of consumption, however, laws and policies appear almost schizophrenic. Presidential candidates support legislation with tough carbon limits while promoting increases in offshore drilling.⁴¹ States adopt stringent future carbon emissions targets while approving large new coal-fired power plants.⁴² The tensions between these positions may well

much gas as an average car at 60. Some luxury yachts require 2+ gallons per mile, and 10 hours of yachting at 100 gallons per hour releases 20,000 lbs. of CO₂, as much as a year of driving an automobile. *Id.* at 110.

38. Bin Shui & Robert C. Harriss, *The Role of CO₂ Embodiment in U.S.-China Trade*, 34 ENERGY POL’Y 4063 (2006).

39. For an overview of the potential of geo-engineering, see Alan Carlin, *Global Climate Change Control: Is There a Better Strategy Than Reducing Greenhouse Gas Emissions?*, 155 U. PA. L. REV. 1401, 1447-50, 1458-64, 1480-85 (2007). *But see* Brooke Ackerly & Michael Vandenbergh, *Climate Change Justice: The Challenge for Global Governance*, 20 GEO. INT’L L. REV. 553, 557 (2008) (concluding that geoengineering solutions raise difficult governance issues).

40. Lieberman-Warner Climate Security Act of 2007, S. 2191, 110th Cong.

41. See McCain-Palin Campaign, *Climate Change*, <http://www.johnmccain.com/Informing/Issues/da151a1c-733a-4dc1-9cd3-f9ca5cab1de.htm> (last visited Sept. 18, 2008) (promising to reduce U.S. carbon emissions by 60% of 1990 levels by 2050); McCain-Palin Campaign, *The Lexington Project: An All-of-the-Above Energy Solution*, <http://www.johnmccain.com/Informing/Issues/17671aa4-2fe8-4008-859f-0ef1468e96f4.htm> (last visited Sept. 18, 2008) (promising expansion of offshore oil drilling); Obama-Biden Campaign, *Barack Obama and Joe Biden: New Energy for America* at 2, 5, http://www.barackobama.com/pdf/factsheet_energy_speech_080308.pdf (last visited Sept. 18, 2008) (promising both to reduce U.S. carbon emissions by 80% of 1990 levels by 2050 and an incentive to increase oil drilling on existing leases).

42. Virginia, for example, recently adopted an energy plan that proposes to reduce the state’s GHG emissions by 30% by 2025, Va. Dep’t of Env’tl. Quality, *Impact of Virginia Energy Plan*, http://www.dep.virginia.gov/export/sites/default/info/documents/climate/Impact_of_VEP_090908.pdf (last visited Sept. 18, 2008), then approved construction of a 585-megawatt coal-fired power plant, Eoin O’Carroll, *Virginia Coal-Fired Power Plant Approved*, CHRISTIAN SCI. MONITOR (Online Edition), June 27, 2008, <http://features.csmonitor.com/environment/2008/06/27/virginia-coal-fired-power-plant-approved/>. Similarly, Minnesota recently enacted legislation setting a long-range target of reducing GHG emissions by 15% by 2015 and

take years to emerge, and in the interim the intellectual framework and public awareness of the relationship between consumption and climate change are sorely lacking.

II. Conceptions of the Consumer and Consumption

Productive debate about the role of consumption within environmental law requires a better understanding of the diverse ways in which the consumer and consumption behavior have been conceptualized. We begin with three stylized depictions of the consumer and discuss briefly their influence within law and policy. We then turn to an examination of varying conceptions of consumption across a range of academic disciplines and note some of their implications for the environment.

A. The Consumer

Law's most influential model of the consumer takes the form of a rational economic actor whose choices are thought to reflect calculated efforts to maximize the satisfaction of personal preferences. By pursuing self-interest in this manner, the individual consumer helps to form the overall level of demand for goods and services that in turn, guides producer investment and decisionmaking. In theory, these interactions lead to a situation of allocative efficiency, in which resources are devoted to their highest valued uses: "In idealized market situations, the unconstrained choices of consumers, coupled with the provision of goods in the marketplace by competitive firms, lead to efficient outcomes as consumers select the bundle of goods they most prefer."⁴³ However, because textbook market conditions are not attained in the real world—because markets fail due to inadequate consumer information, lack of producer competition, negative externalities, incomplete futures markets, and other imperfections of the real world—welfare economic theory provides that government regulators should "intervene" in markets to help them function more closely to the textbook ideal. Often this corrective governmental role simply entails clarifying property rights, providing needed risk information, or otherwise reducing barriers to private ordering. When more substantial interventions are required on the welfare economic account, they should be designed to achieve the outcome that would have flowed from a decentralized market, if it were feasible.

For present purposes, a key aspect of the welfare economic approach is that individual preferences are treated as exogenously determined—that is, their content is taken as given, rather than made a direct focus of inquiry or regulation. Within welfare economics, this agnosticism regarding the grounds of preference is considered essential to mark the discipline off as a positive, rather than normative exercise. Within law, it similarly helps to update for the modern consumer marketplace classical liberal goals of individual autonomy and non-coercive governance. Both aspects were

captured well by the U.S. Court of Appeals for the Second Circuit in *Berkey Photo Inc. v. Eastman Kodak*⁴⁴:

Preference is a matter of individual taste. The only question that can be answered is whether there is sufficient demand for a particular product to make its production worthwhile, and the response, so long as the free choice of consumers is preserved, can only be inferred from the reaction of the market.⁴⁵

As it turns out, however, the goal of purely positivistic, non-coercive assessment and enablement of consumer preferences may be more complicated than this account suggests, particularly with regard to the environmental implications of consumer product manufacture, transport, use, and disposal. In theory, of course, consumer preferences could well extend to these environmental aspects of goods and services, at which point the critical task for law would be to ensure the availability of reliable and accurate information for those consumers who desire to express environmental concerns through their purchasing behavior.⁴⁶ Research suggests, however, that consumers may not have preexisting, stable preferences regarding environmental aspects of consumption and that instead, those preferences might be formed at least in part through the purchasing process itself. Thus, for law, the decision whether to mandate, permit, or prohibit the labeling of goods with respect their environmental attributes may not be capable of being made through the welfare economic technique of examining consumers' preferences; instead, those preferences may be inevitably shaped by the outcome of law's *prior* determination regarding whether to "downstream" information to consumers.

This view regarding the potential constructedness of consumer preferences can be taken to a much greater extreme. In fact, a recurring conception of the consumer, dating back to Veblen and popularized by writers such as John Kenneth Galbraith and Vance Packard, views the modern consumer largely as a product of manufacturer and advertiser design, rather than as a sovereign rational actor or an autonomous liberal agent. From this perspective, consumer preferences are seen as a contrivance of manufacturers and marketers who must unload ever-increasing amounts of frivolous stuff within advanced capitalist economies. As the Connecticut Supreme Court wrote in an early products liability case: "[T]he customer . . . is bewitched, bewildered and bedeviled by the glittering packaging in riotous color and the alluring enticement of the products' qualities as depicted on labels."⁴⁷ The role of law, then, is not simply to ensure that markets function with ever-increasing competitive efficiency. As Galbraith famously wrote: "One cannot defend production as satisfying wants if that production creates the wants."⁴⁸ Instead, the role of law is to redistribute power

80% by 2025, while during the same period its agencies supported efforts to build a large coal-fired power plant and a huge steel plant that collectively will raise state GHG emissions by 5% or eight million tons. Dennis Lien, *Legislature, Governor Move on Greenhouse Gasses*, ST. PAUL PIONEER PRESS, Aug. 28, 2008.

43. W. Kip Viscusi, *Using Warnings to Expand the Boundaries of Consumer Sovereignty*, 23 HARV. J.L. & PUB. POL'Y 211 (1999).

44. 603 F.2d 263 (2d Cir. 1979).

45. *Id.*

46. Cf. Robert Pitofsky, *Beyond Nader: Consumer Protection and the Regulation of Advertising*, 90 HARV. L. REV. 661 (1977) ("[P]rotection of consumers . . . should not be a broad, theoretical effort to achieve Truth, but rather a practical enterprise to ensure the existence of reliable data which in turn will facilitate an efficient and reliable competitive market process.").

47. Hamon v. Digliani, 174 A.2d 294, 297 (1961).

48. JOHN KENNETH GALBRAITH, *THE AFFLUENT SOCIETY* (1958). See also Douglas Kysar & Jon Hanson, *Taking Behavioralism Seriously: Some Evidence of Market Manipulation*, 112 HARV. L. REV. 1420 (1999) (providing an account of market manipulation in which firms in competitive markets evolve toward manufacturing and marketing

away from consumer product firms, aiming in the process to lower the incidence of harmful manipulative behavior and free individuals to pursue less materialistic, more autonomously selected projects.

In between the extremes of rational calculator and constructed victim lies a much more messy, but also much more realistic account of the consumer as socially situated subject.⁴⁹ On this account, consumer preferences should be seen as an ever-shifting aspect of a dialectical conversation between consumers and producers about the object and meaning of consumption. As the social theorist Jean Baudrillard wrote: “Choices . . . reflect the cultural model from which they are produced. We neither produce nor consume just any product: the product must have some meaning in relation to a system of values.”⁵⁰ From this perspective, consumers form both an input, and a product, of the systems of meaning production that occur via consumption. This is why one simultaneously can find spectacular product failures like the Edsel, which seem to belie the hapless consumer vision, and persistent product markets like tobacco, which seem to create an entire social world, with its own mythology, values, and language, and which somehow continues to lure consumers within, one pack at a time. Every product is simply a moment in an evolving dance of definition and redefinition in which no individual, no firm, no sector really leads. To say that consumers are either exclusively sovereign or manipulated is to miss the subtlety and complexity of individuals’ attempts to navigate the dense economy of signs and meanings that is interlaced within the market, right alongside its economy of goods and services.

A fascinating application of this more sociologically and culturally rich analysis of consumer behavior occurred during World War II, when the Office of Price Administration, led by former advertising executive Chester Bowles, conducted a far-ranging advertising campaign designed to persuade citizens on the home front that their private purchasing and product use decisions were intimately tied to the national war effort. One of the most famous elements of this campaign—a poster depicting a man driving by himself in an automobile—chillingly intoned: “When You Ride Alone You Ride With Hitler!”⁵¹ Another poster similarly cautioned: “Waste Helps the Enemy—Conserve Material.” What is remarkable about these government propaganda posters is not only that they actively preached a conservationist mentality, but that they did so with the unabashed aim of seeking to *persuade* consumers, not merely inform them. The campaign appealed to consumers’ nature as social creatures who viewed their purchases and use decisions as in some sense expressive of who they are, in addition to efforts to satisfy preferences. While today Vice President Dick

Cheney observes that “conservation may be a sign of personal virtue, but it is not a sufficient basis for a sound, comprehensive energy policy,” as if the two spheres must inexorably be kept apart, during World War II the government’s policy instead was precisely to promote the idea that conservation is a personal virtue tied to the long-term success of the nation. All of which raises the question: could the growing realization of climate change’s potential magnitude as a policy problem rekindle interest in using the government’s powers of persuasion on behalf of resource conservation and environmental awareness?



The culturally oriented approach provides well-textured descriptions of the consumer and consumption processes, but generally only in hindsight. Hence, legal scholars, officials, and practitioners face a familiar trade off between theoretical tractability and descriptive attractiveness. The rational actor model is highly incomplete and often demonstrably inaccurate as a description of how individuals behave; in that sense, it makes for terrible phenomenology. But it is unparalleled as a concise, scalable model for making broad-brush predictions. Conversely, the cultural account is probably the most compelling of the three as a description of how individuals actually live and experience their consumer selves. But it does not get one very far in terms of predicting behavior or prescribing policy responses. Accounts of consumer preferences as constructed and manipulated attempt to resolve this trade off by incorporating more psychological and social aspects of consumption—such as a more critical inquiry into the effect of advertising on consumer perception and decisionmaking—but without giving up on the goal of modeling the consumer, as opposed to simply interpreting her. Perhaps the most important point to take away from this brief discussion is that on all three accounts—consumer as rational calculator, as constructed vessel, and as social subject—a great deal more government intervention into consumer product markets on account of environmental impacts of consumption could be justified as a matter of theory.

strategies that capitalize on consumer cognitive biases); Mona L. Hymel, *Consumerism, Advertising, and the Role of Tax Policy*, 20 VA. TAX REV. 347 (2000) (examining the environmental consequences of consumer culture and arguing for changes in the favorable tax treatment of advertising expenses, whose primary objective is the promotion of consumption).

49. See Douglas A. Kysar, *Kids & Cul-de-Sacs: Census 2000 and the Reproduction of Consumer Culture*, 87 CORNELL L. REV. 853 (2002) (book review).

50. Jean Baudrillard, *Consumer Society*, in JEAN BAUDRILLARD: SELECTED WRITINGS (2001).

51. See National Archives, *Powers of Persuasion: Poster Art From World War II*, http://www.archives.gov/exhibits/powers_of_persuasion/use_it_up/use_it_up.html (last visited Oct. 7, 2008).

B. Consumption

In addition to efforts to model and understand product purchasing and use behavior from the mindset of the consumer, academics also have focused more specifically on the act of consumption itself. In a paper prepared for a 1995 National Research Council workshop on the environmental impacts of consumption, Paul Stern noted that treating consumption in a rigorous way requires a precise definition of consumption, yet the term has widely varying meanings in economics, physics, ecology, and sociology.⁵² According to Stern, these fields define consumption as follows:

Physics	Consumption is impossible (First Law of Thermodynamics) but transformation of matter/energy occurs. These transformations increase entropy (Second Law of Thermodynamics), in some cases in the form of pollution or decreased usefulness of resources.
Economics	Consumption is total spending on consumer goods and services. Although economists distinguish production and distribution from consumption, environmental impacts result from all three processes. Economists thus prefer to examine the environmental impacts of economic activity, and suggest that economic statistics on consumption should not be relied upon to analyze the environmental effects of consumption.
Ecology	Green plants are producers, and animals such as humans are consumers. [H]uman consumption corresponds to what humanity does with the estimated 40 percent of global terrestrial [Net Primary Productivity (NPP) or net energy from photosynthesis] that we "appropriate." Humans also affect NPP with agriculture.
Sociology	Although often not defined, consumption typically connotes what individuals and households do when they use incomes to increase social status through certain kinds of purchases. Sociological definitions typically do not distinguish environmentally benign from environmentally destructive consumption.

Stern also noted that consumption in the popular literature often is associated with consumerism and materialism, in many cases as a part of a normative critique of modern consumer culture.⁵⁴ Stern suggested that this literature implicitly defines consumption as follows: "Consumption consists of the purchase decisions of households and what they do with their purchases. Its environmental impacts are the transformations of materials and energy that ultimately result from these activities."⁵⁵ He concluded that this approach has some value but that it includes a number of contestable assumptions, such as that individuals and house-

holds are the most important sources of environmental impacts from consumption, that affluence is the root of the environmental impacts of consumption, that economic growth, population growth, and public preferences are the driving forces behind anthropogenic environmental impacts, and that the environmental impacts of consumption are roughly equal for all types of consumption. Although Stern noted the importance of these activities, he suggested that this approach risks overlooking the effects of institutions and technology and of assuming that difficult individual behavior changes are the only means of reducing the environmental impacts of consumption.⁵⁶ The obverse point is also important: that focusing on institutions and technology may lead academics and policymakers to overlook opportunities to reduce the environmental impacts of consumption through individual behavior change.⁵⁷

Stern concluded by proposing a working definition that attempts to overcome the weaknesses in the existing academic and popular definitions: "Consumption consists of human and human-induced transformations of materials and energy. Consumption is environmentally important to the extent that it makes materials or energy less available for future use, moves a biophysical system toward a different state or, through its effects on those systems, threatens human health, welfare, or other things people value."⁵⁸

A 1997 exchange in *Science* suggests the importance of definitional differences in the academy. Norman Myers, an ecologist, defined consumption in a Policy Forum essay as "human transformations of materials and energy," leading him to conclude that the environmental significance of consumption is self-evident.⁵⁹ Myers emphasized the importance of limits to economic growth based on carrying capacity and resource depletion.⁶⁰ For example, Myers noted that many natural resources are being exploited at levels that exceed their carrying capacity and expressed doubt about whether technology can ameliorate the environmental pressures.⁶¹ In addition to carrying capacity, ecologists often emphasize the importance of the laws of thermodynamics, which suggest that although matter can neither be created nor destroyed, anytime energy or matter is converted from one form to another, some energy is transformed to entropy and becomes unavailable to do further work.⁶² We elide this

56. *Id.* at 19.

57. See Michael P. Vandenberg, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Law*, 57 *VAND. L. REV.* 513, 539-40 (2004). Stern does not disagree with the proposition that individual behavior change offers substantial prospects for environmental protection gains. See Paul C. Stern, *Understanding Individuals' Environmentally Significant Behavior*, 35 *ELR* 10785 (Nov. 2005).

58. Stern, *supra* note 52, at 20.

59. Norman Myers, *Policy Forum: Consumption: Challenge to Sustainable Development*, *SCIENCE*, Apr. 4, 1997, at 53, 53.

60. As to the role of the natural and social sciences in reducing the environmental impacts of consumption, Norman Myers suggests: (1) identification of the effects of consumption on the carrying capacity of the environment; (2) determination of the roles of consumption, population growth and technology; (3) determination of why people overconsume and misconsume; and (4) determination of the "driving forces behind consumption" such as societal infrastructure and other economic, institutional, political and policy barriers to sustainable consumption. *Id.* at 54.

61. *Id.* at 53.

62. As Jonathan Gilligan noted in commenting on an earlier version of this introduction, creation of entropy often takes the form of heat, and Albert Bartlett has pointed out that even with infinite energy re-

52. Paul C. Stern, *Toward a Working Definition of Consumption for Environmental Research and Policy*, in *NAT'L RESEARCH COUNCIL, ENVIRONMENTALLY SIGNIFICANT CONSUMPTION: RESEARCH DIRECTIONS* 13-15 (Paul Stern et al. eds, 1997).

53. *Id.*

54. *Id.* at 16.

55. *Id.*

seeming Malthusian constraint only by importing available energy from other systems, most notably the sun, that are subject to their own iron law of dissipation.

In contrast, two economists, Jeffrey Vincent and Theodore Panayotou, responded to Myers by defining consumption in terms of market exchanges of goods and services, leading them to conclude that consumption is not a distinct problem.⁶³ Economists suggest that markets can overcome the ecological and natural resource constraints that concern ecologists through technological responses and resource substitution. The price mechanism is the means by which markets create incentives for new technologies and resource substitution. This mainstream economics approach embodies a vision of limitless frontiers, inexhaustible resources and the unbounded regenerative and absorptive capacities of the earth, and the logical implication of this vision, a primary societal goal of increasing the volume of economic activity as measured by gross domestic product.⁶⁴ For example, Vincent and Panayotou not only concluded that consumption was not a problem, they criticized Myers for “his worries about the depletion of nonrenewable resources,” which they concluded are “contradicted by data on economic availability.”⁶⁵ They also were critical of “his concerns about the planet’s carrying capacity,” which they found to be “of questionable policy relevance given that it is not fixed and that environmental degradation is not strictly proportional to economic activity.”⁶⁶

Ecologists and economists thus disagree not only about the definition of consumption but about many other fundamental attributes of the relationship between consumption

sources, growth would be limited because eventually the amount of heat produced by human machinery—even machinery operating at the maximum theoretical efficiency allowed by the laws of nature—would make the surface of the earth too hot for life. See Albert A. Bartlett, *Forgotten Fundamentals of the Energy Crisis*, 46 AM. J. PHYS. 876 (1978). Gilligan’s informal calculations suggest that 200 years of growth of energy consumption at 5% compounded annually would be sufficient to raise the average surface temperature of the earth to about 145 degrees Fahrenheit, the temperature of a steak cooked to “medium.” This temperature is due solely to the heat produced directly by human energy consumption, not to any greenhouse effect. He assumes that heat is radiated to space with the maximum efficiency allowed by the laws of physics (Stefan Boltzmann law applied to a perfect black body) and that none of the heat is trapped by a greenhouse effect.

63. Jeffrey R. Vincent & Theodore Panayotou, *Policy Forum: . . . or Distraction?*, SCIENCE, Apr. 4, 1997 at 53, 53; Jeffrey R. Vincent & Theodore Panayotou, *Policy Forum: Response to Myers*, SCIENCE, Apr. 4, 1997, at 55, 55. See also Kenneth Arrow et al., *Are We Consuming Too Much?*, 18 J. ECON. PERSP. 147 (2004); Frank Ackerman, *Consumed in Theory: Alternative Perspectives on the Economics of Consumption*, 31 J. ECON. ISSUES 651 (1997).

64. For recent discussions of economic perspectives on consumption and the environment, see Douglas A. Kysar, *Law, Environment and Vision*, 97 NW. U. L. REV. 675 (2003); Kysar, *supra* note 6.

65. Vincent & Panayotou, *Response to Myers*, *supra* note 63.

66. *Id.* at 55. Ecological economists would likely differ because they recognize natural constraints on human activity, constraints which include both the scarcity of nonrenewable resources and the limited capacity of the environment to absorb the pollution produced by the exploitation of those resources. Under this conception, the earth is seen as a closed system requiring a focus on the environmental impact of human activity. See, e.g., Kenneth Boulding, *The Economics of the Coming Spaceship Earth*, reprinted in VALUING THE EARTH: ECONOMICS, ECOLOGY, ETHICS 297 (Herman E. Daly & Kenneth N. Townsend eds., 1993) (contrasting the “cowboy economy” with the “spaceman economy”). The approach advocated by ecological economists has not received widespread acceptance by other economists, however. See Daly, *supra* note 8.

and the environment. In addition, debates among ecologists and economists may ignore important institutional, cultural, religious, legal, and other issues. In a letter to *Science* commenting on the Myers, Vincent and Panayotou debate, Stern, a social psychologist, and sociologist Thomas Dietz noted that the environmental implications of consumption depend on “the type of economic consumption, its social, political, and geographical context, and the level of analysis.”⁶⁷ They advocated moving from general debates about the definition of consumption to focus on “the socioeconomic and institutional conditions affecting particular kinds of environmentally significant biophysical consumption.”⁶⁸ According to Stern and Dietz: “Understanding cannot be deduced from theory in either economics or ecology; careful and fine-grained empirical investigation is the route to progress. Context is everything in this debate.”⁶⁹

III. Consumption and Climate Change

The Articles in this issue follow the Stern and Dietz advice by examining consumption in the context of GHG emissions. Many commentators have noted that adverse environmental impacts arise not from consumption per se but from consumption in excess of some level. At the same time, identifying a level of excess consumption or overconsumption can be problematic.

For climate change, overconsumption might be expressed as the level of consumption that yields atmospheric GHG concentrations in excess of thresholds that substantially increase the risk of catastrophic climate change. The emerging consensus is that atmospheric concentrations should not exceed roughly 450 to 550 parts per million (ppm) and that reductions in the 60-80% range from recent levels will be required by 2050 to achieve atmospheric concentrations of 450 to 550 ppm.⁷⁰ This definition admittedly puts the rabbit in the hat by assuming a consensus that substantial increases in the risk of catastrophic climate change should be avoided. At the same time, the large number of nations, states, local governments, private firms and nonprofit organizations that have adopted emissions reduction targets in the 60-80% range suggests that this is at least a widespread aspiration, and it is thus a reasonable starting point for examining overconsumption associated with climate change (even if ultimately more radical changes away from the status quo emissions situation are required).

The Articles that follow reflect the spirited debate that occurred at the Climate Change and Consumption Conference. The first set of Articles emerged from a panel of legal and economic academicians. W. Kip Viscusi concludes that household consumption decisions are important, and he uses household energy utilization as a case study to examine the determinants of individual consumption decisions and to identify how the decisions could better account for environmental impacts. Mark Cohen and Michael Vandenbergh examine the growing economic literature on the limited extent to which economic indicators of social success, such as per capita income, are associated with self-reports of happi-

67. Paul C. Stern & Thomas Dietz, Letter: Consumption and Sustainable Development, 276 SCIENCE 1631, 1631 (1997).

68. *Id.* at 1632.

69. *Id.*

70. See Vandenbergh & Steinemann, *supra* note 33, at 1686-87 (discussing emerging consensus).

ness or well-being. Cohen and Vandenberg suggest that adding regular reports of aggregate well-being to the traditional economic indicators of social success may induce policymakers to pursue policies that will generate equal or greater levels of well-being with less material consumption and carbon emissions. David Skeel examines the relationships among religious beliefs, material consumption, and climate change through the lens of evangelicals' views about the environment. Skeel observes that environmental concern among evangelicals has had several high water marks over the past 40 years, and he suggests that the history provides insights into whether evangelicals' recent surge in climate change interest will endure.

Two Articles by legal academicians, one by Purdy and Salzman and one by McAllister, examine the complex relationships between food production, alternative fuels, and climate change. Purdy and Salzman demonstrate the remarkable importance of corn throughout the economy and use the consumption of corn products to examine the relationship between consumer behavior and civic or political behavior regarding climate change. McAllister examines the role that soybean and beef consumption in the developed world plays in driving deforestation in Brazil, the fourth-largest emitter of GHGs in the world despite having only the 82d highest GDP per capita according to World Bank statistics. She is optimistic about the prospects for new sustainable consumption governance regimes to reduce deforestation arising from soybean production but less so about the prospects for new cattle ranch certification schemes.

The second set of Articles is the product of presentations made by sociologists, political scientists, and environmental scientists. Jack Barkenbus demonstrates that large increases in consumption are evident from housing, major appliance, and motor vehicle purchasing trends in the United States over the last 30 years. He suggests that a fundamental reframing of purchasing decisions will be required to reverse the trends. Charlie Wilson draws on survey data to demonstrate that large reductions can be achieved in household energy use, but he notes that the most effective policy measures often require policymakers to depart from existing theoretical models and to use innovative tools. Carrie Armel suggests that reliable and valid tools for measuring the frequency, duration, and intensity of individual carbon-emitting behaviors may generate data that help reduce carbon

emissions. She surveys a number of tools for measuring individual carbon footprints and the frequency, duration and intensity of the underlying behaviors. Dana Fisher's article shifts the focus from direct energy and environmental behavior to civic or political behavior. She examines the role of climate change activists by presenting data collected during the 2007 Step It Up National Day of Climate Action. She compares the activists to the general American population and concludes that the participants are more civically engaged and liberal than the American public. Mark McCaffrey and Susan Buhr note the widespread public misconceptions about climate and GHG initiatives, and they describe a new effort to identify the Essential Principles of Climate Literacy for use by formal and informal educators.

Many of the Articles in this issue suggest that changing the consumption patterns of individuals and households will yield substantial reductions in GHG emissions. Perhaps the most important issue to emerge from the Conference on Climate Change and Consumption, however, is that empirical evidence is remarkably lacking on how changes in consumption behavior might affect behavior in other realms, most notably in terms of civic and political engagement. We know that large changes in individual behavior can yield meaningful reductions in carbon emissions. We also know that achieving 60-80% reductions will require infrastructure changes as well as individual behavior change. Finally, we know that the promotion of such infrastructure changes will require great political will and popular support. What we do not know is whether changes in individual behavior that reduce energy consumption and carbon emissions will undermine or stimulate public support for systemic social changes. Put more sharply, does green consumption serve as a gateway to more direct political activity or as a commodified palliative to ensure the continuation of business as usual? For example, if I buy a carbon offset for my car or truck, am I less or more likely to support vehicle fuel economy standards and mass transportation funding? If the former, a focus on changing individual behavior to reduce carbon emissions ultimately could be counterproductive. If the latter, efforts that change individual behavior may buy much-needed time for systemic changes and stimulate public support for adopting those changes. This is just one of the kinds of questions that a focus on consumption can and should bring to the climate change debate.