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The Liberal Limits of Environmental Law: A Green Legal Critique

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ARTICLE

The Liberal Limits of Environmental Law: A Green Legal Critique

MICHAEL M'GONIGLE*

LOUISE TAKEDA**

I. ABSTRACT

The field of environmental law embodies a deep contradiction—it is a product of the state, yet the state is the primary agent of development. This contradiction infuses state-supported resource regimes (energy, forestry, agriculture, water use) that have long been agents of environmental erosion while they have remained resistant to progressive reform. It also underpins the theoretical framework for proposed reforms today, ecological modernization. The result is that environmental law extends, rather than resolves, society's underlying environmental “problematic.” This can now be seen in institutional responses to climate change and the “green economy.” To address this situation, the authors apply a critical new approach—green legal theory (GLT)—to analyze these historical resource regimes and today's emerging issues. GLT does so by expanding the conception of law to address the “constitutive” or “regulatory”

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effects of those “system dynamics” that set the larger economic, political, and cultural conditions for social/environmental relations. In this task, GLT aims to help move “legal” analysis into the pursuit of the systemic re-formations that exist beyond the liberal limits of environmental law.

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III. INTRODUCTION

Barack Obama had been in office barely one year when the British petroleum-owned Macondo well exploded in the Gulf of Mexico on April 20, 2010. Eventually unleashing more than 200 million gallons of oil, much of which washed ashore in Louisiana, this was to become the worst environmental disaster in American

history and the world's largest accidental oil spill. An assault on a fragile environment and an affront to big business, the spill was also an impeachment of the regulatory credibility of government. This article addresses the historical and contemporary nature of the dynamics of the state and its economic partners, and what these portend for a new approach to "regulation" that looks beyond the limits of environmental law.

Speaking at a White House press conference, President Obama acknowledged the problem: "For years there's been a scandalously close relationship between oil companies and the agency that regulates them. . . . [T]he oil and gas industry has leveraged such power that they have effectively been allowed to regulate themselves."¹ The President pointed to the industry-tailored law that allows only thirty days for the Interior Department to review an exploration plan, far too little time to conduct an environmental review. Instead, environmental reviews are routinely waived. In contrast to the common criticisms of "over-regulation," Obama pointed to "the oil industry's cozy and sometimes corrupt relationship with government regulators [that] meant little or no regulation at all."² When questioned whether this situation could be attributed to the Bush Administration when his own administration had continued to give drilling permits under questionable circumstances, Obama admitted that the culture "in which oil companies were able to get what they wanted, without sufficient oversight and regulation" had not yet "fully" changed.³

1. Presidential News Conference on the Gulf Oil Spill, 2010 DAILY COMP. PRES. DOC. 2 (May 27, 2010) [hereinafter The President's News Conference], available at <http://www.gpo.gov/fdsys/pkg/DCPD-201000422/pdf/DCPD-201000422.pdf> (referencing a recent Inspector General's report detailing widespread corruption within the Minerals and Management Service, the agency in charge of approving permits and enforcing laws, during the Bush years); see Donald C. Hubbard, U.S. DEP'T OF INTERIOR, INVESTIGATIVE REPORT – ISLAND OPERATING COMPANY ET AL. CASE NO. PI-GA-09-0102-I (Feb. 29, 2009), available at http://www.eenews.net/public/25/15844/features/documents/2010/05/25/document_gw_02.pdf (last visited Feb. 14, 2013) (this investigative report was initially created in response to routine Freedom of Information Act requests; however, it was made public by the Department of Interior shortly after the Deepwater Horizon disaster).

2. The President's News Conference, *supra* note 1, at 2.

3. *Id.* at 9.

Even more pointed was the question as to whether he regretted his decision, announced only three weeks prior to the disaster, to open up offshore drilling in previously protected areas.⁴ Obama's answer revealed a telling conundrum: "[T]o the extent that we're using oil, it makes sense for us to develop our oil and natural gas resources here in the United States and not simply rely on imports. That's important for our economy; that's important for economic growth."⁵ At the same time, he acknowledged the increasing expense and risk involved with extracting ever-dwindling oil reserves:

The fact that oil companies now have to go a mile underwater and then drill another three miles below that in order to hit oil tells us something about the direction of the oil industry. . . . And we as a society are going to have to make some very serious determinations in terms of what risks are we willing to accept.⁶

Like the recent financial crisis, this latest environmental crisis would, in his opinion, force Americans "to do some soul searching."⁷

At the time, the BP spill had all the makings of a game-changer.⁸ As Hoffman and Jennings point out, public awareness of the negative environmental effects of human activities was higher than ever in the age of climate change—the public was skeptical of high-profile players like BP, an oil company that had been aggressively rebranding itself as "green" ("Beyond Petroleum"), and its partner in the Gulf, Halliburton Co., a name

4. These included parts of Alaska, the eastern Gulf of Mexico, and parts of the Atlantic coast. This was the biggest expansion of offshore oil drilling in the U.S. in fifty years.

5. *Id.* at 11.

6. *Id.* at 13.

7. *Id.* at 15.

8. Andrew J. Hoffman & P. Devereaux Jennings, *The BP Oil Spill as a Cultural Anomaly? Institutional Context, Conflict, and Change*, 20 J. MGMT. INQUIRY 100, 101 (2011) ("When an event or issue poses a potential challenge to a dominant technological or economic institutional order, conflict ensues over the nature, meaning and response to the event. If this challenge is significant enough to generate substantial conflict, the event can become a 'cultural anomaly' for the current order.").

almost synonymous with Dick Cheney.⁹ As the spill ravaged Gulf Coast communities, it rekindled old feelings of shame for the bureaucratic incompetence and compassion for the political indifference that followed the devastation wrought on New Orleans by Hurricane Katrina. Once again, unethical behavior and corruption were alleged against a federal agency, the Minerals Management Service. All the while, an underwater geyser of oil gushed uncontrollably, threatening an ecological Armageddon and eroding the faith in engineering and technology upon which future energy development depended.

But there was still a source of hope. Barack Obama, the “most environmentally-friendly president ever,”¹⁰ assured everyone that his administration would do whatever was necessary to protect and restore the Gulf Coast. Quickly, the President announced a six-month moratorium on drilling new offshore oil wells and a halt to the controversial environmental waivers.¹¹ He also committed to putting in place “aggressive new operating standards and requirements for offshore energy companies.”¹² In addition, his administration would suspend planned exploration off the coast of Alaska, cancel proposed lease sales in the Gulf of Mexico and off the coast of Virginia, and suspend action on thirty-three deepwater wells currently being

9. *Id.* at 103-04; see also HENRY A. WAXMAN, HOUSE COMM. ON GOV. REFORM, FACT SHEET: HALLIBURTON'S IRAQ CONTRACTS NOW WORTH OVER \$10 BILLION (Dec. 9, 2004), available at <http://web.archive.org/web/20070426011102/http://oversight.house.gov/documents/20050916123931-74182.pdf> (Dick Cheney was the CEO of Halliburton from 1995 until 2000 when he retired to run for U.S. Vice President. However, ties between Cheney and Halliburton were shown to remain, leading to controversy when Halliburton was awarded several major contracts worth more than \$10 billion in connection with the 2003 Iraq War).

10. Sandip Roy, *Sierra Club's Carl Pope: BP Has Gulf in a 'Hostage Situation'*, NEW AMERICA MEDIA, July 13, 2010, <http://newamericamedia.org/2010/07/carl-pope-on-bp-oil-spill.php>.

11. See Tim Dickinson, *The Spill, The Scandal and the President*, ROLLING STONE, June 8, 2010, <http://www.rollingstone.com/politics/news/the-spill-the-scandal-and-the-president-20100608> (the moratorium would purportedly affect only thirty-three deepwater wells or less than one percent of drilling operations in the Gulf. In addition, records indicated that both waivers and permits continued to be granted with at least six waivers granted in the first four weeks after the moratorium was announced); see also Ian Urbina, *Despite Moratorium, Drilling Projects Move Ahead*, N.Y. TIMES, May 24, 2010, at A1.

12. The President's News Conference, *supra* note 1, at 2.

drilled. Moreover, he would provide a new safeguard by separating those issuing permits to the oil industry from those regulating it.¹³

As news coverage stretched from days to weeks, the media expanded its focus beyond the impacts of the spill on the marine ecology to its effect on the economy and, by extension, the political survival of Barack Obama. A report by the International Energy Agency noted that regulatory changes to offshore drilling could jeopardize nearly one million barrels of new crude production daily.¹⁴ A spokesperson for the American Petroleum Institute remarked, "It would be unfortunate if this accident were to cause implementation of laws, rules or regulations that reduce US production, cost American jobs or reduce energy security."¹⁵ Meanwhile, analysts at JP Morgan Chase saw a silver economic lining in the disaster, noting that the massive cleanup effort from the spill might even offset the negative economic impacts of a two-month drilling moratorium and actually boost U.S. economic growth.¹⁶ And, as weeks turned to months, the prospect of cultural soul-searching gave way to a Popular Mechanics-style fascination with the sci-fi wizardry of the "junk shot" or "top kill" that might cap the spill.¹⁷

After eighty-seven days of continuous gushing, on July 14, 2010, BP succeeded in temporarily capping the well. Three weeks later, the government released findings from a report that

13. *Id.*

14. Nathan Vander Klippe, *Spill Could be "Game Changer" for Oil*, GLOBE & MAIL (June 10, 2010, 7:27 PM), <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/spill-could-be-game-changer-for-oil/article1599917/>.

15. Shawn McCarthy, *Fate of US Drilling Hinges on Spill Resolution*, GLOBE & MAIL (May 26, 2010, 7:13 PM), <http://www.ctv.ca/generic/generated/static/business/article1582170.html>.

16. Luca Di Leo, *Oil Spill May End Up Lifting GDP Slightly*, WSJ BLOGS - REAL TIME ECONOMICS (June 15, 2010, 9:35 AM), <http://blogs.wsj.com/economics/2010/06/15/oil-spill-may-end-up-lifting-gdp-slightly/> (citing a JP Morgan report, the article notes that 4,000 unemployed people hired for cleanup efforts could be worth between \$3-6 billion. "If realized, this would likely mean a near-to-medium-term boost to activity that might offset the drags.").

17. See Gillian Grace, *Top kill? Junk shot? A Primer on BP's Wacky Oil Spill Terminology*, NAT'L POST, May 31, 2010, <http://news.nationalpost.com/2010/05/31/top-kill-junk-shot-a-primer-on-bps-wacky-oil-spill-terminology/>.

claimed that 74% of the oil had either evaporated or been burned, skimmed, recovered from the wellhead or dispersed much of which is in the process of being degraded.¹⁸ Broadcast across the national morning news, it suggested that all might soon be well, despite imperfect technology, engineering, and politics. One commentator remarked that this was “a public relations coup for a White House eager to get the oil spill story off the front pages, reassert control over a narrative that had gotten away from them, and calm fears.”¹⁹ Two weeks later, there was much less fanfare when the study’s lead author, Bill Lehr, retracted these assurances and admitted in congressional testimony that “most of [the oil] is still in the environment.”²⁰

When the well was permanently capped in September 2010, so too were any lingering challenges to oil exploration and extraction. By mid-October the government announced new rules for offshore drilling and lifted the drilling moratorium. With the Obama Administration proclaiming a new, safer, and more cautious era of drilling, the oil industry proceeded apace with production. Even with the moratorium and stricter regulations, the national rig count for November 2010 totaled 1,683, an

18. See JANE LUBCHENCO ET AL., NOAA, BP DEEPWATER HORIZON OIL BUDGET: WHAT HAPPENED TO THE OIL? (2010), *available at* http://www.noaanews.noaa.gov/stories2010/PDFs/OilBudget_description_%2083final.pdf (unmentioned were the unprecedented 1.84 million gallons of the oil dispersants, Corexit 9580 and 9500A, applied during the cleanup effort and the many concerns over the adverse health effects of the dispersants); see Krishnan Sriram et al., *Neurotoxicity Following Acute Inhalation Exposure to the Oil Dispersant COREXIT EC9500A*, 74 J. TOXICOLOGY & ENVTL. HEALTH 1405 (2011); Stacey E. Anderson et al., *Potential Immunotoxicological Health Effects Following Exposure to COREXIT 9500A During Cleanup of the Deepwater Horizon Oil Spill*, 74 J. TOXICOLOGY & ENVTL. HEALTH 1419 (2011).

19. Dan Froomkin, *Questions Mount About White House’s Overly Rosy Report on Oil Spill*, HUFFINGTON POST, May 25, 2011, http://www.huffingtonpost.com/2010/08/20/overly-rosy-report-on-oil_n_688142.html.

20. Suzanne Goldenberg, *BP Scientist Retracts Assurances Over Success of Cleanup*, THE GUARDIAN, Aug. 19, 2010, 4:34 PM, <http://www.guardian.co.uk/environment/2010/aug/19/bp-oil-spill-scientist-retracts-assurances>; see also COMM. ON OVERSIGHT & GOV’T REFORM, NOAA SCIENTIST: RELEASE OF OIL SPILL REPORT DONE BY WHITE HOUSE, NOT NOAA (2010), *available at* <http://oversight.house.gov/noaa-scientist-release-of-oil-spill-report-done-by-white-house-not-noaa/> (Dr. Lehr informed congressional investigators that the report “was released by White House officials and not scientists at the NOAA.”).

increase of 576 or 52% over the same time the previous year.²¹ By February 2011, BP reported fourth quarter profits of \$5.6 billion, a 30% increase from a year earlier, and resumed its first dividend payouts to shareholders since the disaster.²²

The BP disaster could have kicked off a critical examination of the dominant economic and political order. But its containment and astute political management meant that a serious challenge to America's oil addiction never appeared on the public radar. After all, to challenge oil is to challenge what oil fuels—a growing economy that demands cheap and reliable primary resource inputs. Centuries of economic achievement have produced the cultural expectation of an ever-expanding economy flowing seamlessly from its past. Economic growth, coupled with productivity-enhancing technology, has answered the demands of labor not by redistributing the economic pie, but by increasing its overall size. And stable economic management lies at the core of modernist state politics with its attendant need for ever more energy, ever more consumption, and ever more extractions from nature, all at the least possible cost. Thus does a seemingly irresolvable conundrum between economic production and environmental protection pervade the modern state—in the oil fields and the world's great forests, in mountainous rivers and coastal estuaries? This is not just an economic or political problem, but a cultural one as well, with centuries of material progress providing the foundation for an age of high consumption that has defied critical evaluation.

Environmental law was born not to resolve this conundrum but to bolster one side of it by providing a bulwark against ecological erosion. Such a rebalancing, it was believed, could overcome specific challenges through governmental intervention and legal adjustment, as Obama so dexterously achieved in the wake of a potential environmental catastrophe. But what if something more fundamental *is* at stake? In what could have been a description of the background to the BP oil spill (except

21. See *Baker Hughes Announces November Rig Counts*, BAKER HUGHES (Dec. 7, 2010), <http://investor.shareholder.com/bhi/releasedetail.cfm?ReleaseID=535481>.

22. *BP Profit Rises to \$5.6 billion US*, CBC NEWS, Feb. 1, 2011, 11:58 AM, <http://www.cbc.ca/news/business/story/2011/02/01/bp-quarterly-profit.html>.

that it was written years before), Mary Wood writes that the bureaucratic scale of the modern “administrative state is geared almost entirely to the legalization of natural resource damage . . . , the majority of agencies spend[ing] nearly all of their resources to permit, rather than prohibit, environmental destruction.”²³ Understanding this conundrum, and how it has shaped the whole character of environmental law, requires a critical debate about the legal field, its relation to larger structural dynamics, and broader discourses that draw on contemporary theoretical knowledge and critiques. It requires discussions of the nature of well-worn legal strategies, not only whether they are efficacious for the immediate challenges at hand, but also how they might affect more fundamental changes to the contexts that give rise to these challenges.

This is the starting task of what we call “green legal” analysis and critique. The present paper begins (Part II) by reviewing briefly diverse legal regimes that regulate a range of resource sectors, looking at the interaction between state interests, economic objectives, and regulatory designs, and what this interaction has meant for environmental law. In each case, state agencies are faced with the contradictory mandate of protecting the very resources that the state relies on for royalties, export revenues, industrial development, and economic growth. And the state has not merely been an incidental participant or disinterested manager in the process of the construction of these diverse industrial structures—it has been central to their design and construction. A survey of legal literature reveals that critical thought about these relations is slight in both directions, environmental law paying scant attention to critical legal theory while such critical legal theory pays little heed to the role of nature in economic and political life. In Part III, we interrogate the field’s inherited liberal foundations and many of its prized strategies, particularly its embrace of the economistic theory of “ecological modernization.” In doing so, we bring to light ideological and institutional assumptions underpinning the field,

23. Mary Christina Wood, *Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part I): Ecological Realism and the Need for a Paradigm Shift*, 39 ENVTL. L. 43, 55 (2009).

and consider whether these are consistent with, or counterproductive to, the ambitions of the field. Continuing with this inquiry, Part IV examines what we call the “contradictions” in environmental law, and looks at how these play out today in strategies to overcome climate change and promote “green” alternatives. We conclude in Part V with a preliminary explication of a larger, theoretically-grounded, critical vision of law and social change that can take us beyond environmental law, what we call “green legal theory” (GLT).²⁴ GLT attempts to address the structural character of the environmental “problematic” which, unlike environmental law, it treats as “constitutional” in nature but not only in the limited meaning of that word. Instead, GLT seeks to open up the broader and more powerful “constitutive” processes of institutional and cultural “regulation” some of which are made apparent throughout this article. These processes are of a *de facto* “legal” (i.e. socially regulative) character but are captured neither by environmental law nor, any form of “legal” law. It is our hope to initiate a conversation toward this broader approach that will provide both a counterpoint for, and critical reach beyond, environmental law.

IV. HISTORY AND CHARACTER OF ENVIRONMENTAL LAW

A. Legacy of Reform

Environmentalists have put a great deal of struggle and hard work into establishing the vast array of environmental laws that we know today. These laws have had an enormous practical impact, from removing lead additives in gasoline to protect brain development in children, to making many previously polluted streams and rivers drinkable, and protecting large swaths of

24. We define “green legal theory” as an approach to “social regulation” that moves nature from the periphery to the center of political, economic, and cultural life. See generally R. Michael M’Gonigle & Paula Ramsay, *Greening Environmental Law: From Sectoral Reform to Systemic Reformation*, 14 J. ENVTL. L. & PRAC. 342 (2004); R. Michael M’Gonigle, *Green Legal Theory: A New Approach to the Concept of Environmental Law*, 4 ÖKOLOGISCHES WIRTSCHAFTEN 34 (2008); R. MICHAEL M’GONIGLE, EARTH RULES: ON THE LAWS, BEHIND THE LAWS, THAT HOLDS US TO ACCOUNT (forthcoming 2014).

wilderness to facilitate biodiversity conservation. Though the field may be “ramshackle, replete with inconsistencies and paradoxical gaps, and surrounded by critics urging its fundamental redesign,” nevertheless, notes Richard Lazarus, it has internalized “discernible evolutionary convergences in regulatory approaches based on decades of actual experiences with what works well and what does not [so that] the basic architectural features of U.S. environmental law seem essentially in place.”²⁵ Its scope is certainly huge, and this section will necessarily be limited in the detail of its analysis of environmental laws. Its goal is rather to make clear the conundrum posed by the interaction of the liberal economic/political context with its environmental regulatory constraints. As we discuss below, this leads to what might be called environmental law’s “problematic.”

Although some important environmental laws in the United States reach back sixty years,²⁶ environmental law in its modern guise is commonly seen to have taken shape in the late 1960s and early 1970s. This was marked by the passage of the National Environmental Policy Act (NEPA) in 1969, the creation of the Environmental Protection Agency (EPA) in 1970, and the avalanche of legislation that followed, including the Clean Air Act (CAA), Clean Water Act (CWA), Endangered Species Act (ESA), Safe Drinking Water Act (SDWA), Resource Conservation and Recovery Act (RCRA), and the Toxic Substances Control Act (TSCA). Early successes in resource conservation include the Wilderness Act of 1964, the Land and Water Conservation Fund Act of 1964, and the National Wild and Scenic Rivers Systems of 1968.²⁷ Between 1960 and early 2000, the National Park System more than tripled in size from 25 million acres to over 83 million acres. Since 1964, Congress has set aside 106 million acres of land and designated over 10,800 protected miles of rivers. The Endangered Species Act of 1973 has been characterized as “one of

25. RICHARD J. LAZARUS, *THE MAKING OF ENVIRONMENTAL LAW* 206-07 (2004).

26. See KARL BOYD BROOKS, *BEFORE EARTH DAY: THE ORIGINS OF AMERICAN ENVIRONMENTAL LAW, 1945-1970* 38ff (2009) (tracing the earliest environmental laws to shortly after World War II).

27. MICHAEL E. KRAFT, *ENVIRONMENTAL POLICY AND POLITICS* 177-82 (4th ed. 2006).

the strongest federal environmental laws” that “symbolizes the nation’s commitment to resource conservation goals.”²⁸ Its most celebrated successes include recovery of the American bald eagle, the peregrine falcon, and the California grey whale. By 2006, the Fish and Wildlife Service had designated 470 critical habits, and it had developed over 500 habitat conservation plans and around 1,000 approved recovery plans.²⁹

Natural resource management has become a burgeoning field that has changed the nature of raw material extraction, whether of renewable resources like forests and fisheries or non-renewables such as minerals and oil and gas.³⁰ Legislation designed to conserve natural resources and reduce ecological damage include the Coastal Zone Management Act of 1972, the Forest Rangeland Renewable Resources Planning Act of 1974 and 1978, the Federal Land Policy and Management Act of 1976, the National Forest Management Act of 1976, the Surface Mining Control and Reclamation Act of 1977, and the Outer Continental Shelf Lands Act of 1978. Each imposes both procedural obligations shaping planning and development, as well as substantive standards that such development must adhere to.

Environmental regulations have had a direct effect on human health, for example, by decreasing urban smog and improving water quality. The EPA’s 2008 *Report on the Environment* reported a 96% drop in lead levels between 1980 and 2006; a decline of 75% in the anthropogenic carbon monoxide emissions between 1980 and 2002; a decrease of 41% of ambient concentrations of nitrous oxides between 1980 and 2006; and a decline of 37% in sulphur dioxide emissions between 1990 and 2002.³¹ The decline of nitrous oxides and sulphur dioxide has resulted in a decrease in acid rain across most of the U.S., which in turn has lowered the acidity of many rivers and lakes. In addition, between 1970 and 1985, the Clean Water Act led to a

28. *Id.* at 192.

29. *Id.* at 47.

30. Note that the term “natural resource” derives from a utilitarian understanding of the earth that shapes and limits related analysis and discussion.

31. U.S. ENVTL. PROT. AGENCY, 2008 REPORT ON THE ENVIRONMENT 2-14, available at http://www.epa.gov/roe/docs/roe_final/EPAROE_FINAL_2008.pdf.

32% increase in the number of people served by wastewater treatment plants, resulting in a 46% drop in the annual release of organic wastes in the U.S.³² The Safe Drinking Water Act, moreover, has led to improvements in drinking water quality, particularly in cities, with the worst point-source water pollution mostly eliminated.³³

Many more laws have indirectly improved human health, for example, by changing the nature of the materials allowed in consumer products. The Toxic Substances Control Act of 1976 led to the review of more than 50,000 existing chemicals by the EPA. In addition, EPA reviews approximately one thousand new chemicals each year and regulates their manufacture, sale, use, and disposal to prevent “unreasonable risk of injury to health or the environment.”³⁴ The 1986 Emergency Planning and Community Right to Know Act requires manufacturers to report annually to the EPA the quantity of more than 650 toxic chemicals that have been released by them into the air, water, and land.³⁵ Some of these regulations have been aimed specifically at changing industrial and market processes to improve their resource efficiencies, to mandate resource recovery and recycling, or to shape patterns of consumption. The National Energy Act of 1978, for example, led to an array of tax credits to improve energy efficiency in homes and increased taxes on gas guzzling cars. As a result, appliances became 75% more efficient from the late 1970s to early 1990s, while passenger automobiles increased their gas mileage from fourteen to twenty-two miles per gallon between 1973 and 1991.³⁶ The Pollution Prevention Act of 1990 helped usher in comprehensive state-level recycling laws and innovative municipal programs leading to an increase in

32. KRAFT, *supra* note 27, at 32.

33. RICHARD N. L. ANDREWS, *MANAGING THE ENVIRONMENT, MANAGING OURSELVES: A HISTORY OF AMERICAN ENVIRONMENTAL POLICY* 281 (1999).

34. LAZARUS, *supra* note 25, at 73.

35. *Emergency Planning and Community Right-to-Know Act (EPCRA)*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/agriculture/lcra.html> (last visited Mar. 23, 2013); see KRAFT, *supra* note 27, at 36; R. Michael M’Gonigle et al., *Community Right to Know: Improving Public Information about Toxic Chemicals*, 5 J. ENVTL. L. & PRAC. 95 (1995).

36. KRAFT, *supra* note 27, at 164-65.

recycling of municipal waste from 6% in 1960 to 33% in 2005.³⁷ Similarly, generation of hazardous waste decreased by nearly 20% between 1999 and 2005.³⁸

The breadth, depth, and diversity of what the environmental law hath wrought is impressive. Yet, amidst these successes, many serious environmental problems have persisted or gotten worse. For example, despite achievements in wilderness conservation, ecologically critical wetlands continue to be lost to development,³⁹ with the amount of developed land in the U.S. increasing by 47% between 1982 and 2002.⁴⁰ The Endangered Species Act may be the hallmark of environmental commitment in America, yet relatively few species have made it off the endangered list since the passage of the Act in 1973. And while a wide array of resource management statutes impose planning requirements and environmental standards, the implementing agencies are given “great discretion to interpret and implement the statutes” as they attempt to juggle economic exploitation of public resources with environmental protection.⁴¹

In terms of air and water quality, atmospheric concentration of greenhouse gases went up by 16% between 1990 and 2005.⁴² While reduction of nitrous oxides and sulphur dioxide led to a drop in acid rain, high nitrogen and phosphorous concentrations affect 30% of shallow streams.⁴³ Incidentally, the Clean Water Act fails to target non-point sources of nitrogen and phosphorous, deriving primarily from agricultural runoff. Likewise, the EPA reported in 2008 that around 60% of shallow wells tested in agricultural areas contained pesticides.⁴⁴ And despite thousands of chemicals now being regularly reviewed and regulated,

37. U.S. ENVTL. PROT. AGENCY, REPORT ON THE ENVIRONMENT: HIGHLIGHTS OF NATIONAL TRENDS 21 (2008) [hereinafter REPORT ON THE ENVIRONMENT], available at http://www.epa.gov/roehd/pdf/roe_hd_layout_508.pdf.

38. *Id.* at 23.

39. KRAFT, *supra* note 27, at 212.

40. REPORT ON THE ENVIRONMENT, *supra* note 37, at 20.

41. KRAFT, *supra* note 27, at 179, 181.

42. REPORT ON THE ENVIRONMENT, *supra* note 37, at 8.

43. *Id.* at 11.

44. *Id.* at 12.

extensive chemical use continues in ways that put public health and the environment at risk.⁴⁵

Some inroads were definitely made with fuel efficiency. At the same time, the Gas Guzzler Tax excluded small trucks, leading to an explosion in the market for inefficient minivans and SUV's. By 2004, this loophole allowed for an average level of fuel efficiency that was less than what had been achieved almost two decades earlier.⁴⁶ Likewise, the size, expanded functions, and sheer abundance of appliances have cancelled out many of the gains made by efficiency standards for home appliances. Although pollution prevention laws help to increase recycling, the amount of waste generated in the U.S. regularly increases in pace with consumer spending.⁴⁷ As a result, the amount of solid waste generated per person has remained the same at about four and a half pounds per day.⁴⁸ Richard Andrews notes:

[W]ith few exceptions – leaded gasoline, PCBs, and a very few pesticides – none of these policies were designed to systematically reduce the actual production and use of serious pollutants. Nor were they designed to manage more pervasive causal factors in human behavior patterns and economic activity, such as the continuing urbanization of the landscape and its ecosystems and the increasing use of energy and materials per capita.⁴⁹

A systematic analysis of how diverse underlying economic and political forces have created the environmental problem is critical to understand what might be called the “problematic” of environmental law. This term generally refers to the “configuration of theoretical concepts presupposed in a text of discourse” thus defining “the ‘field’ of questions which can be posed and the forms the answers must take.”⁵⁰ The occasional

45. KRAFT, *supra* note 27, at 35.

46. TERRY TAMMINEN, LIVES PER GALLON: THE TRUE COST OF OUR OIL ADDICTION 71 (2006).

47. KRAFT, *supra* note 27, at 40.

48. REPORT ON THE ENVIRONMENT, *supra* note 37, at 21.

49. ANDREWS, *supra* note 33, at 253.

50. BLACKWELL DICTIONARY OF TWENTIETH-CENTURY SOCIAL THOUGHT 513 (William Outhwaite & Tom Bottomore eds., 1994) (our usage adapts this meaning to refer to the underlying configuration of power relations and intellectual frameworks that create a “problem,” and that then sets the

acknowledgement of the need to address root causes, or carping about the development of the “consumer society” points to an implicit recognition of the existence of an underlying environmental problematic. *But environmental law itself does not address this problematic; it operates within it.* In the next section, we will therefore consider the economic and political context of these environmental problems, highlighting the structure of production and consumption, and the role of law within that structure.

B. Structures from History

In contrast to the limited focus of most environmental law, it is important to cast back to reveal the structural dynamics that create the environmental “problem.” This entails a broader understanding of law in its economic and political context, that is, seeing law through a lens that can make visible those larger constitutive processes of which the regulatory regimes are just one part. This is the lens of *political economy*. When political economy gives prominence to the place of nature, it is known as *political ecology*. What follows might then be characterized as a political ecology perspective, one that is designed to illuminate the problematic that shapes environmental law rather than the problems that environmental law addresses. To do this, the following section will briefly review the history of law and policy in five primary resource sectors: oil and gas, biofuels, forestry, agriculture, and water.

a. Oil and Gas

When President Obama announced his “Comprehensive Plan for Energy Security” in the spring of 2010, many of his environmental supporters were shocked to hear that large areas of U.S. coastal waters in the Atlantic Ocean, Gulf of Mexico, and

boundaries that limit the discourse about the nature of those relations and their resolution).

the Arctic would be opened to oil and natural gas drilling.⁵¹ Obama told his audience:

This is not a decision that I've made lightly. . . . But the bottom line is this: Given our energy needs, in order to sustain economic growth and produce jobs and keep our businesses competitive, we're going to need to harness traditional sources of fuel even as we ramp up production of new sources of renewable, home grown energy.⁵²

George Bush put it more bluntly in his 2006 State of the Union Address stating: "We have a serious problem: America is addicted to oil. . . ."⁵³ Addiction is a well-chosen word because it recognizes something that is fundamental to character, long established, self-destructive—and difficult to change. The U.S. is the world leader in per capita oil consumption, which with only 4.6% of the world's population, produces 21% of the global GDP, and consumes 26% of its oil.⁵⁴ But the addiction is worldwide with every national government committed to the economic growth and increased productivity that oil enables. Such goals are only achievable with an ever-swelling use of energy and growing consumption of resources. As the oil and gas industry has warned U.S. administrations since the 1930s, "unless the federal and state governments worked with the oil and gas industry to increase production . . . [the] U.S. oil and gas industry would decline and the nation would become more dependent on foreign oil."⁵⁵

In the United States, domestic energy policy from the late nineteenth century to the present has been based on a fundamental link between the level of energy production and

51. *Remarks by the President on Energy Security at Andrews Air Force Base*, THE WHITE HOUSE (Mar. 31, 2010), available at <http://www.whitehouse.gov/the-press-office/remarks-president-energy-security-andrews-air-force-base-3312010>.

52. *Id.*

53. *State of the Union Address by the President*, THE WHITE HOUSE (Jan. 31, 2006) <http://georgewbush-whitehouse.archives.gov/stateoftheunion/2006/>.

54. DAVID HOWELL & CAROLE NAKHLE, *OUT OF THE ENERGY LABYRINTH: UNITING ENERGY AND THE ENVIRONMENT TO AVERT CATASTROPHE* 68 (2007).

55. See Alex Mills, *Obama Energy Policies Bring Rationale Questions*, GO SAN ANGELO, Oct. 17, 2009, <http://www.gosanangelo.com/news/2009/oct/17/obama-energy-policies-bring-rationale-questions/?print=1>.

gross domestic product. In general, as more energy is produced, prices remain stable or relatively low and the GDP grows to increase general welfare.⁵⁶ As a result, low oil prices amount to the best prescription for an inflation-free economic boom. This is reflected by business cycles, the rises and falls of which have since 1973 echoed the patterns of oil prices. Until 1998, oil prices played a stronger and statistically more significant role than interest rates in American unemployment levels.⁵⁷ Profit margins widen dramatically as the price of energy falls.⁵⁸ Demand gains strength fuelling rising stock markets and higher wages. And, of course, voters reward politicians for all of these things—low inflation, high employment, and booming economic growth.

Energy law and policy, and the environmental law and policy related to it, are thus framed by the overriding commitment to economic development and growth based on access to cheap energy resources. Important degrees of difference exist (for example, between more collectivist European and more individualist American approaches), but access to stable and as-cheap-as-possible energy animates the energy and environmental policies of all major players on the world stage. While conservation measures and environmental regulations can mitigate some of the negative impacts of growth, they do not challenge the broad goal of expanding production to allow increased consumption.⁵⁹

This productionist orientation of energy industries, markets, and regulation in the U.S. assumed the shape it has today nearly a century ago. For example, the common law developed the “rule of capture,” which allocated ownership of oil to the person who

56. JOSEPH P. TOMAIN & RICHARD D. CUDAHY, *ENERGY LAW IN A NUTSHELL* 383 (2004).

57. JOHN BACHER, *PETROTYRANNY* 259 (2000).

58. *Id.* (the economic boom from 1993 to 1999 has sometimes been attributed to the “tech” revolution, but others now argue that it was the product of an oil glut and breakdown of OPEC discipline).

59. MATTHEW ALAN CAHN, *ENVIRONMENTAL DECEPTIONS: THE TENSION BETWEEN LIBERALISM AND ENVIRONMENTAL POLICYMAKING IN THE UNITED STATES* 105 (1995).

found and took control of it.⁶⁰ This spurred landowners to “drill as many holes as possible so as to extract . . . oil and gas before his neighbor.”⁶¹ Two provisions in the Tax Act were later introduced in an effort to increase domestic oil and gas production. The expensing of intangible costs of drilling and dry holes was introduced in 1916, allowing oil and gas producers to write off a significant portion of the costs incurred in “bringing a well to production.”⁶² The percentage depletion allowance came into effect in 1926 enabling producers to deduct 27.5% of revenue from their gross income annually, even allowing deductions in excess of the cost of their investment.⁶³ These and many other tax breaks reduced effective tax rates and ultimately the costs of production, thereby increasing exploitation.⁶⁴ Royalties may also be reduced or waived to encourage oil exploration and development in difficult physical conditions.⁶⁵ In addition, the

60. *Acton v. Blundell*, 152 Eng. Rep. 1223, 1235 (1840) (“That the person who owns the surface may dig the rein, and apply all that is there found to his own purposes at his free will and pleasure.”); Bruce M. Kramer & Owen L. Anderson, *The Rule of Capture - An Oil and Gas Perspective*, 35 ENVTL. L. 899, 899 (2005) (the rule of capture was also applied to groundwater, game animals, and minerals).

61. Kramer & Anderson, *supra* note 60, at 899.

62. SALVATORE LAZARI, CONG. RESEARCH SERV., RL33578, ENERGY TAX POLICY: HISTORICAL AND CURRENT ISSUES 5-6 (2008) (intangible drilling costs include such things as labor and material costs, equipment repairs, hauling and drilling site preparation. Dry holes make up about 80% of all wells drilled. Expensing of these costs, provided through the Tax Act, allows them to be deducted against other types of income).

63. *Id.* at 6.

64. See Joseph Mandarino, *A Survey of Federal Energy Tax Incentives*, 14 DIALOGUE 6 (2006); GILBERT METCALF, MIT JOINT PROG. ON SCI. & POL’Y OF GLOBAL CHANGE NO. 142, FEDERAL TAX POLICY TOWARDS ENERGY (2007); TAMMINEN, *supra* note 46, at 60 (estimating the annual value of credits or subsidies for 2006 as follows: 2005 Energy Policy Act, \$6 billion; depletion allowance, \$784 million to \$1 billion; fuel production tax credit, \$769-900 million; enhanced oil recovery tax credit, \$26-100 million; foreign tax credit, \$1-3 billion; foreign income “deferral,” \$183-318 million; and accelerated depreciation allowance, \$1-4.5 billion).

65. See, e.g. JOHN DUFFIELD, OVER A BARREL: THE COSTS OF U.S. FOREIGN OIL DEPENDENCE 75-76 (2007) (the Outer Continental Shelf Deep Water Royalty Relief Act of Nov. 1995 reduced or eliminated royalties in existing leases of oil and gas resources in deep-water areas, and suspended royalties on new leases in specified water depths in the Gulf of Mexico for five years. Likewise, the government issued new regulations in 1996 that lowered royalties on federal lands that produced heavy oil).

U.S. federal government spent more than \$100 billion on energy research and development between 1974-2000.⁶⁶

In fact, the energy sector is one of the world's most subsidized industries, receiving total government handouts of between \$240-\$310 billion per year.⁶⁷ According to a report by the Environmental Law Institute, federal fossil fuel subsidies in the U.S. totaled \$72.5 billion between 2002-2008.⁶⁸ The majority of subsidies were made up of just a handful of tax breaks, the two most significant for that period being the Foreign Tax Credit at \$15.3 billion and the Credit for Production of Nonconventional Fuels at \$14.1 billion.⁶⁹ These were followed by exploration and development expensing at \$7.1 billion, percentage over cost depletion at \$5.441 billion, and the credit for enhanced oil recovery at \$1.575 billion.⁷⁰ Although earning record profits, oil companies are nevertheless expected to receive more than \$32.9 billion in handouts between 2008-2013.⁷¹

66. *Id.* at 76 (at its peak spending between 1978-1981, nearly 75% of this budget went to research on synthetic fuels from coal and oil shale despite their low net energy potential and highly toxic byproducts. By contrast, 14% of R&D spending went to traditional oil and gas research leaving only around 10% for alternative energy).

67. "Global Green New Deal" *Environmentally-Focused Investment Historic Opportunity for 21st Century Prosperity and Job Creation*, UNITED NATIONS ENV'T PROGRAMME (Oct. 22, 2008), <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=548&ArticleID=5957&l=en>.

68. ADEYEYE, ADENIKE ET AL., ENVTL. L. INST., ESTIMATING U.S. GOVERNMENT SUBSIDIES TO ENERGY SOURCES: 2002-2008, 6 (2009), available at http://www.elistore.org/Data/products/d19_07.pdf.

69. *Id.* at 3-18.

70. *Id.*

71. FRIENDS OF THE EARTH, BIG OIL, BIGGER GIVEAWAYS (2009), available at http://libcloud.s3.amazonaws.com/93/72/4/447/FoE_Oil_Giveaway_Analysis_2008.pdf. The \$32.9 billion subsidy includes tax benefits, royalty relief, research and development subsidies as well as accounting gimmicks such as the "last in, first out" method which reduced income taxes in times of inflation by recording the most recently produced items as sold first. There is a chance that these subsidies could be tempered in the future in light of the recent congressional fights over the defeated Ending Big Oil Tax Subsidy Act, H.R. 601, 112th Cong. (2011), and President Obama's announcement in September 2011 of a deficit reduction plan that includes eliminating \$41 billion in subsidies (tax loopholes) to the oil and gas industry. See Daniel Weiss & Valeri Vasques, *Big Oil's Mountain of Cash*, CENTER FOR AMERICAN PROGRESS (Sept. 27, 2011), http://www.americanprogress.org/issues/2011/09/big_oil_cash.html.

Thus the true costs of fossil fuel dependence are buried in the law beneath a myriad of formal (direct and indirect) public subsidies. On top of these, however, are a variety of informal or implicit subsidies including countless so-called environmental “externalities,” such as air pollution, acid rain, oil spills, health impacts, and premature deaths, which have long been treated as manageable economic costs.⁷² Almost as significant, but in different ways, is the massive subsidy provided through the maintenance of active military support, a subsidy that skews the whole orientation of federal budgets, expenditures, foreign relations, and “military-industrial” politics.⁷³ In addition, Oil Change International reports that the U.S. Congress provided more than \$15.6 billion in international “oil aid” financing between 2002-2007.⁷⁴ While often presented as “development assistance,” such aid commonly amounts to a subsidy for some of the wealthiest oil corporations.⁷⁵ The details of energy law and policy may vary with the political persuasion of governments, but the general orientation does not.⁷⁶

72. These externalities are not fully manageable and, in monetary terms, are not fully measurable. This is clearly the case with, for example, climate change, the costs of which some have conservatively estimated to be \$1 trillion per year or more. See NORMAN MYERS & JENNIFER KENT, *PERVERSE SUBSIDIES: HOW TAX DOLLARS CAN UNDERCUT THE ENVIRONMENT AND THE ECONOMY* 80-81 (2001). According to the 2006 U.K. governmental report *The Economics of Climate Change*, “solving” climate change (by holding the increase in CO₂ in the atmosphere to 500 ppm, even though the consensus level that is needed to stabilize the climate is the much lower figure of 350 ppm) would take an estimated 1% of global GDP. See NICHOLAS STERN, *THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW* xiv (2007).

73. The largest financial subsidy that is unaccounted for in American energy policy is military intervention that helps provide security for oil operations in countries such as Iraq, Colombia, and oil-rich regions of Central Asia and West Africa. U.S. military interventions, particularly under the umbrella of the war on terror, have worked to establish favorable conditions for implementing the U.S.-directed projects in Iraq and Colombia that have opened up oil reserves for exploitation by multinational oil corporations. See GARRY LEECH, *CRUDE INTERVENTIONS: THE UNITED STATES, OIL AND THE NEW WORLD (DIS) ORDER* 4 (2006).

74. Steve Kretzmann, *Aiding Oil, Harming the Climate*, OIL CHANGE INT’L (Dec. 6, 2007), <http://priceofoil.org/2007/12/06/aiding-oil-harming-the-climate/>. The \$15.6 billion in “oil aid” is in addition to domestic subsidies

75. *Id.*

76. See TOMAIN & CUDAHY, *supra* note 56, at 70-72. The authors note the similarities in energy policies from Reagan and Clinton through to Bush

On the other side of the production equation, the modern state that facilitates production profits directly from it. According to the Tax Foundation, between 1981 and 2008, oil producers paid an average of \$14.37 billion per year to federal and state governments in corporate income taxes and almost double the amount to foreign governments.⁷⁷ Over the same 27-year period, the industry paid a total of \$1.1 trillion in excise and sales taxes.⁷⁸ In the never-ending circle that is the modern capitalist economy, these excise taxes go directly to support highway maintenance that, in turn, subsidize automobile purchases and use.⁷⁹ For governments, the promise of incoming investments, taxes, and/or export dollars drives all governments to support the outgoing costs of developing the energy industry with incentives and subsidies. In Canada, for example, energy exports reached \$133 billion in 2008, the highest value ever, and a record of 28% of all merchandise trade.⁸⁰ Canada surpassed Saudi Arabia as the largest single exporter of oil to the U.S. in 2001. The vast “tar sands” in northern Alberta receive strong government support for growth in production despite their low net energy returns and high environmental costs.⁸¹ As the

illustrating that despite differences in rhetoric, all adhere to the basic fossil fuel production model. *Id.* at 30.

77. Scott Hodge, *IEA Study Ranks Nations' Subsidies to Fossil Fuel Consumption*, TAX FOUND. (Nov. 20, 2010), <http://taxfoundation.org/article/iea-study-ranks-nations-subsidies-fossil-fuel-consumption>.

78. *Id.*

79. More recently, approximately 15% goes to fund mass transit. See METCALF, *supra* note 64, at 5; PAMELA JACKSON, CONG. RESEARCH SERV., RL30304, THE FEDERAL EXCISE TAX ON GASOLINE AND THE HIGHWAY TRUST FUND—A SHORT HISTORY (2006).

80. See STATISTICS CANADA, CANADA YEAR BOOK 2009 137 (2009). This includes exports of crude petroleum, natural gas, coal, petroleum and natural gas products, and electricity (hydro and nuclear). However, crude oil alone accounted for \$41.8 billion. As parts of Canada also import energy, the net energy exports for 2008 were \$73 billion. Note that energy exports decreased to \$79.9 billion in 2009 due to the recession and the fall in prices, with a corresponding decline in net exports to \$46 billion. See STATISTICS CANADA, CANADA YEAR BOOK 2010 143 (2010).

81. One barrel of bitumen oil from the tar sands emits three times as much greenhouse gas as one barrel of conventional oil. To extract each barrel of tar sand oil also requires three barrels of water, 90% of which ends up in toxic tailing ponds. This has led to groundwater contamination and high rates of a rare cancer in a downstream community. Each day, the industry also uses the

world's largest energy project, investments in the tar sands now total approximately \$200 billion, attracting nearly 60% of all global oil investments.⁸² Yet no comprehensive assessment has been conducted of the environmental, economic, or social impacts.⁸³ This kind of pattern applies in spades in developing nations that receive critical foreign investment and trade dollars from their oil and gas sales. In Nigeria, for example, petroleum revenues constitute 90-95% of the state's total budget revenues.⁸⁴ For that reason, the Nigerian government has been willing to take extreme measures to protect the interests of the oil industry in their country.⁸⁵

From a GLT perspective, one can assess the environmental problematic and its attendant processes in new ways. For one thing, of concern here are not specific "legal" laws but complex regimes of power and law. In this light, specific regulatory initiatives that might restrain production confront an established and successful economic (and political) "dynamic" that limits what can be done. This dynamic and the underlying logic that gives effect to it constitutes a "deeper" level of "regulation" that must be understood in new ways, with new tools, and with very different approaches not to "legal reform" but to "systemic reformation." Here we can see how production is controlled by large, capital-intensive, integrated and centralized private firms,

equivalent amount of natural gas required to heat four million homes. If development proceeds as projected, it will "destroy or industrialize a forest the size of Florida." See ANDREW NIKIFORUK, *TAR SANDS: DIRTY OIL AND THE FUTURE OF A CONTINENT* 1-4 (2d ed., 2010). A report by the International Institute for Sustainable Development estimated that the tar sands receive \$1.59 billion annually in subsidies from the federal (Canada) and provincial (Alberta) governments. Production in 2008 was 442 million barrels, or about 42% of all oil production in Canada, with an export value of \$37 billion. This production is expected to double by 2018. See DAVE SAWYER & SETON STIEBERT, *ENVIROECONOMICS, INC., FOSSIL FUELS – AT WHAT COST?* 22 (2010), available at http://www.iisd.org/gsi/sites/default/files/ffs_awc_3canprovinces.pdf.

82. NIKIFORUK, *supra* note 81, at 2.

83. *Id.*

84. Abiola Morgan-Anyakwo & Craig Withers, *B2B Opportunities in Nigeria's Oil and Gas Industry*, *AFRICA J.*, Winter 2006, at 14.

85. One tragic case is that of Ken Saro-Wiwa and eight other Ogoni activists who led a non-violent campaign against the extreme environmental damage in the Niger Delta caused by the multinational petroleum industry, especially Shell. All were hanged in 1995 by the military government.

all of which are publicly regulated by large government agencies such as the Department of Energy in the United States, with the activities of both fuelling the macro-economy. This model dates from a time when constraints to production could be overcome with technology and capital, and the goal of government was to ensure that these were available. Environmental concerns arrived later on the government agenda, emanating from separate legislation situated in specialized (and different) agencies, and provoking limited bureaucratic movement. The dominant goal of policy was, and continues to be, overcoming constraints to production in order to support on-going economic growth. Despite recent developments like global warming, regulatory authorities do not take seriously those who call for a “new economy” designed to work within energy and environmental constraints rather than overcome them. For a green legal theorist, this conundrum points beyond the formal law the true sources of social regulation (and ‘re-form’).

In contrast, the task of environmental law has and remains that of mitigating the impacts of production. And mitigation is a big and complex job—from setting standards for exploitation and development, to protecting sensitive areas from development, to limiting the impacts of production on air and water quality.⁸⁶

86. For example, the Safe Drinking Water Act addresses the injection of fluids for oil and gas extraction under its Underground Injected Control Program while the Clean Water Act addresses discharges of surface water by exploration and production activities. The Clean Air Act sets concentration limits for specific airborne pollutants as well as seven hazardous pollutants. Interestingly, however, none of the National Emissions Standards for Hazardous Airborne Pollutants apply to oil and gas exploration and production. See U.S. ENVTL. PROT. AGENCY, EXEMPTION OF OIL AND GAS EXPLORATION AND PRODUCTION WASTES FROM FEDERAL HAZARDOUS WASTE REGULATIONS (2002), available at <http://epa.gov/osw/nonhaz/industrial/special/oil/oil-gas.pdf>. In addition, a wide range of laws are administered by the U.S. Environmental Protection Agency that address energy production including the Energy Policy Act of 2005, the Marine Protection Research and Sanctuaries Act of 1972, and the Oil Pollution Act of 1990. Prior to 2008, there was a congressional moratorium on drilling on much of the outer continental shelf of the U.S., though this ban was allowed to expire in 2008. Contrary to his position during the 2008 presidential campaign, Obama began to open these waters to drilling in April 2010 before largely reversing his decision following the oil spill in the Gulf of Mexico. The Arctic National Refuge has also been protected from oil and gas extraction, though this status is an ongoing political controversy. Its continuing protection from development is far from assured particularly under a

The regulatory goal is not to change social patterns in order that we might leave oil and coal in the ground, and rivers undammed, but to make their development less harmful to an implicit, and unchallengeable, social trajectory. This is why policy is usually justified in terms of greater ‘efficiency’ in use rather than re-structured reductions in ‘demand’. Cars were not banned from the city, and massive conversions not made to public transit and bicycles. Energy users were not penalized with fines for above average consumption. Consumer culture was not challenged with the purchase of larger appliances and profligate energy use penalized. Quite the opposite. The 1980s and 90s (when conservation was a public priority) saw the greatest boom in consumerism and energy use in planetary history. Of course, many environmentalists and environmental lawyers would like nothing better than to see the pace of energy development slowed or even stopped. But that is not possible within the structure in which environmental law is embedded—and there is nothing in the lexicon of this field of regulation to help one think outside, let alone get outside, that structure that puts production as the priority, with environmental regulation pulling up the rear.

Thus, beyond greater efficiency, the orientation of energy and environmental law and policy is toward making new, and risky, forms of supply workable. For example, exploiting remote and hard-to-access oil deposits in sensitive ecosystems like the Arctic or under the deep ocean, manufacturing dirty oil from the tar sands, creating hydrogen fuels and expanding existing sources of electricity to produce them (including nuclear energy), developing problematic new technologies to create “clean coal” and sequester their greenhouse gases underground and—despite its claims of being something new—bringing on stream so-called “alternative” or “green” renewable energy.

Republican majority in the House of Representatives. In terms of international standards, the American Petroleum Industry maintains about 400 voluntary standards which are widely used in the U.S. and globally, and were historically seen as the industry standard.

b. Biofuels

This GLT approach directs attention to the problematic (in both senses of the word) promise of “alternative” energy, such as biofuels. Facing rising scarcity and higher costs for hydrocarbons, the use of biofuels has increased dramatically over the past two decades. In 2009, the U.S. alone produced 10.75 billion gallons of ethanol, more than double the 5.6 billion gallons it produced in 2006.⁸⁷ The U.S. Energy Security and Independence Act of 2007 created federal renewable fuel mandates of 36 billion gallons by 2022.⁸⁸ To meet this, the government estimates that 527 new biorefineries requiring \$168 billion in investment will be needed.⁸⁹ The EU’s Renewable Energy Directive sets binding targets for 20% of all energy and 10% of transport fuels to come from renewable sources by 2020.⁹⁰ The same kind of trend can be seen worldwide.⁹¹ Yet, to replace 10% of the gasoline in the U.S. with ethanol and biodiesel would require 43% of current U.S. cropland to be allocated to biofuel production.⁹² To meet a substitution rate of 10% liquid biofuels

87. U.S. DEP’T OF AGRIC., USDA REGIONAL BIOFUELS ROADMAP TO MEETING THE BIOFUELS GOALS OF THE RENEWABLE FUEL STANDARD BY 2022 AS SET OUT IN THE ENERGY INDEPENDENCE AND SECURITY ACT OF 2007 2 (2010), *available at* http://www.usda.gov/documents/USDA_Biofuels_Report_6232010.pdf; ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2008, WITH PROJECTIONS TO 2030 8 (2008), *available at* [http://www.eia.doe.gov/oiaf/aeo/pdf/0383\(2008\).pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2008).pdf).

88. ENERGY INFO. ADMIN., *supra* note 87, at 18.

89. U.S. DEP’T OF AGRIC., *supra* note 87, at 7.

90. Directive 2009/28/EC, of the European Parliament and of the Council of 23 April 2009 on the Promotion of the Use of Energy From Renewable Sources and Amending and Subsequently Repealing Directives 2001/77/EC and 2003/30/EC.

91. Canada requires all gasoline to have a 5% average renewable fuel content and, since July 1, 2010, has mandated a 2% biofuel content for diesel fuel and heating oil. India aims for 20% of its fuels to derive from ethanol by 2017, Brazil has a minimum ethanol mandate of 18-20% (reduced from 25% in 2010), and China is aiming for a 10% biofuel mandate for 2020. For a listing of biofuel mandates in fifty-two countries, see Jim Lane, *Biofuels Mandates Around the World*, BIOFUELS DIGEST (July 21, 2011), <http://biofuelsdigest.com/bdigest/2011/07/21/biofuels-mandates-around-the-world/>; *see also Ethanol from Around the World*, BIOFUELS ASS’N OF AUSTL., http://www.biofuelsassociation.com.au/index.php?option=com_content&view=article&id=69&Itemid=86 (last visited Feb. 26, 2013).

92. C. Ford Runge, *The Case Against Biofuels: Probing Ethanol’s Hidden Costs*, YALE ENV’T 360 (Mar. 11, 2010), http://e360.yale.edu/feature/the_case_

globally could require an area equivalent to 36% of the world's arable land.⁹³ These statistics point to the challenge and potential conflicts implicated in meeting current targets for biofuel production.

Despite such findings, the biofuel boom continues to be generously sponsored by government subsidies. Canada, the U.S., and the EU spent \$11 billion on biofuel subsidies in 2006 alone, with such spending predicted to rise to \$25 billion per year by 2015.⁹⁴ Subsidies include tax concessions and direct support such as exemptions from fuel excise taxes, loans, and grants for investment in productive capacity.⁹⁵ The U.S. spent \$16.8 billion subsidizing corn-based ethanol between 2002-2008, totaling more than half of all subsidies to renewable energy.⁹⁶ As of 2011,

against_biofuels_probing_ethanols_hidden_costs/2251/. Twenty-four percent of the corn harvest in the U.S. was used for ethanol production in 2007, yet contributed only 1.3% toward national liquid fuel use. See Robert Howarth et al., *Rapid Assessment on Biofuels and Environment: Overview and Key Findings*, in *BIOFUELS ENVIRONMENTAL CONSEQUENCES AND INTERACTIONS WITH CHANGING LAND USE: PROCEEDINGS OF THE SCIENTIFIC COMMITTEE ON PROBLEMS OF THE ENVIRONMENT (SCOPE) INTERNATIONAL BIOFUELS PROJECT RAPID ASSESSMENT 1, 2* (Robert Warren Howarth & S. Bringezu eds., 2009), available at http://cip.cornell.edu/DPubS/Repository/1.0/Disseminate?view=body&id=pdf_1&handle=scope/1245782000.

93. See Howarth et al., *supra* note 92. Estimates of required agricultural land range from 118-508 million hectares depending on the crop used and assumed level of productivity. If a combination of jatropha and sugar cane, (the two preferred crops in terms of greenhouse gas benefits) were used, the total land required to meet a 10% biofuel substitution target globally would be an estimated 243 million hectares or 17% of the current 1,400 million hectares of arable land globally. See N.H. Ravindranath et al., *Greenhouse Gas Implications of Land Use and Land Conversion to Biofuel Crops*, in *BIOFUELS ENVIRONMENTAL CONSEQUENCES AND INTERACTIONS WITH CHANGING LAND USE*, *supra* note 92, at 117.

94. ORG. FOR ECON. CO-OPERATION AND DEV., *BIOFUEL SUPPORT POLICIES: AN ECONOMIC ASSESSMENT* 111, 147 (2008), available at <http://www.oecd-ilibrary.org/docserver/download/fulltext/5108121e.pdf?expires=1337981432&id=id&acname=ocid177125&checksum=D9299B33850EEE0A3D1B187D29B1E4A9>.

95. See RONALD STEENBLIK, *GLOBAL SUBSIDIES INITIATIVE, BIOFUELS-AT WHAT COST? GOVERNMENT SUPPORT FOR ETHANOL AND BIODIESEL IN SELECTED OECD COUNTRIES: A SYNTHESIS OF REPORTS ADDRESSING SUBSIDIES FOR BIOFUELS IN AUSTRALIA, CANADA, THE EUROPEAN UNION, SWITZERLAND AND THE UNITED STATES 2* (2007), available at <http://www.globalsubsidies.org/files/assets/oecdbiofuels.pdf>.

96. ENVTL. LAW INST., *ENERGY SUBSIDIES BLACK, NOT GREEN* (2009), available at http://www.eli.org/pdf/Energy_Subsidies_Black_Not_Green.pdf. Biofuel

blenders in the U.S. received a tax credit of \$.45 per gallon of ethanol blended into conventional gasoline and \$1 per gallon of biodiesel blended into fossil diesel.⁹⁷ In 2009, these biofuel tax credits in the U.S. amounted to \$6 billion.⁹⁸ There are also a variety of agricultural schemes such as the EU's Energy Crop Aid which pays 45 Euros per hectare for non-food crops. Government funding for research and development (R&D) has also poured into the commercialization of biofuel technologies. The U.S. spent \$800 million on R&D related to biofuels from 1993-2004.⁹⁹ The EU allocated around 139 million Euros for biofuels and biorefinery research in 2007 and 2008.¹⁰⁰ Canada has invested \$145 million (Cdn) into its Agricultural Bioproducts Innovation Program to support R&D to advance its bio-based economy,¹⁰¹ a small portion of the \$2.2 billion allocated to programs to boost domestic production.¹⁰² Energy security remains a strong justification for such government spending, but the USDA's involvement underlines the push for new market outlets and additional demand for American agricultural products to raise farm incomes and stimulate economic growth.¹⁰³

While biofuels are often promoted as eco-friendly and a weapon against climate change, evidence to the contrary is growing.¹⁰⁴ Studies are showing some biofuel production systems

Watch reported that biofuels comprised 80% of all "renewable energy" subsidies in the U.S. and add up to \$5.5 to \$7.3 billion per year. Almuth Ernsting, *From Agrofuels to Biochar*, BIOFUEL WATCH (Aug. 31, 2010), http://www.biofuelwatch.org.uk/docs/agrofuels_and_biochar_article.pdf.

97. This is down from \$0.51 cents ethanol tax credit set in the Energy Policy Act of 2005. See STEENBLIK, *supra* note 95, at 33. Both the ethanol and biodiesel tax credits were due to expire at the end of 2011. While the biodiesel tax credit was extended, the ethanol tax credit was allowed to expire.

98. RONALD WILLIAM GECAN ET AL., CONG. BUDGET OFFICE, USING BIOFUEL TAX CREDITS TO ACHIEVE ENERGY AND ENVIRONMENTAL POLICY GOALS vii (2010), available at <http://www.cbo.gov/ftpdocs/114xx/doc11477/07-14-Biofuels.pdf>.

99. *Id.* at 36.

100. *Id.* at 34.

101. *Id.* at 36.

102. *Id.* at 34.

103. This is underlined by the involvement of the U.S. Department of Agriculture in biofuel policy. See ORG. FOR ECON. CO-OPERATION AND DEV., *supra* note 94, at 27.

104. See G. Phillip Robertson et al., *Agriculture - Sustainable Biofuels Redux*, 322 SCI. 49 (2008) (discussing the sustainability of biofuel production).

to result in a net increase in greenhouse gas emissions, particularly when nitrous oxide emissions from the use of nitrogen fertilizer are taken into account.¹⁰⁵ Even more concerning are the greenhouse gas emissions that result from conversion of native ecosystems, particularly forests and peat lands, to biofuel crops.¹⁰⁶ One study using a world-wide agricultural model to estimate emissions from land-use change found that corn-based ethanol nearly doubled greenhouse gas emissions over 30 years, with emissions continuing to increase for the next 167 years.¹⁰⁷ Another study found that conversion of rainforests with peat soils to palm plantations could increase net emissions of greenhouse gas emissions by a factor of twenty relative to the use of fossil fuels.¹⁰⁸ This is particularly concerning as the biofuel boom has lifted palm oil prices by nearly half, contributing to the state-supported expansion of plantations in both Indonesia and Malaysia at the expense of carbon-rich peat swamps and tropical rainforest.¹⁰⁹

Expansion of biofuel production also comes up against the growing demand for food. According to David Mitchell, a lead economist with the Development Prospects Group of the World Bank, the 53% rise in food prices between March 2007 and March 2008,¹¹⁰ and 140% increase in food prices between January 2002

105. Nitrous oxide is 300 times more potent in its global warming effect than carbon dioxide. See Howarth et al., *supra* note 92, at 3-4.

106. *Id.* at 4.

107. Timothy Searchinger et al., *Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-use Change*, 319 SCI. 1238 (2008).

108. Life cycle analyses that do not take into consideration the emissions from land-use changes misleadingly report an 80% saving in greenhouse gases for palm oil in comparison to fossil fuels. See Howarth et al., *supra* note 92, at 5; E. Minichetti & M. Otto, *Energy Balance and Greenhouse Gas Emissions of Biofuels from a Life-Cycle Perspective*, in BIOFUELS ENVIRONMENTAL CONSEQUENCES AND INTERACTIONS WITH CHANGING LAND USE, *supra* note 92.

109. E.B Fitzherbert et al., *How Will Oil Palm Expansion Affect Biodiversity?*, 23 TRENDS IN ECOLOGY & EVOLUTION 538, 539 (2008); ASBJØRNE EIDE, THE RIGHT TO FOOD AND THE IMPACT OF LIQUID BIOFUELS (AGROFUELS) 22 (2009), available at <http://www.fao.org/docrep/016/ap550e/ap550e.pdf>.

110. FOOD & AGRIC. ORG. OF THE UNITED NATIONS, SOARING FOOD PRICES AND FOOD SECURITY (2008), available at <http://www.fao.org/forestry/15371-0ec68d2068ad0a8d29a1e2bd6630fce96.pdf>; see EIDE, *supra*, note 109, at 14; Steven Sexton et al., *Food Versus Fuel: How Biofuels Make Food More Costly*

and February 2008 was due, in large part, to biofuels production.¹¹¹ In addition to increasing food prices, biofuel production weakens access to food for vulnerable populations by concentrating land for plantation-type production resulting in evictions or the marginalization of vulnerable inhabitants and increasing competition for water.¹¹² Water for irrigation is already in short supply and may soon be inadequate to meet the demand for food in many regions.¹¹³ The perverse impact of biofuel production is, thus, to pit the world's 800 million wealthy car owners against the world's 2 billion poorest people.¹¹⁴

It is, as one commentator noted, "a sad irony of the biofuels experience that resource alternatives that seemed farmer-friendly and green have turned out so badly."¹¹⁵ At the same time, however, the policies surrounding biofuel production are framed not by environmental and social concerns, but by the same overriding commitment of energy policy more generally: to ensure access to stable and as-cheap-as-possible energy in order to keep the economy growing. While conservation measures and environmental regulations might mitigate some of the worst impacts of energy production, whether biofuels or oil and gas, they do nothing to challenge the environmentally harmful goals of expanded production and increased consumption. This is the real, yet hugely neglected, systemic locus of social "regulation" that drives specific legal laws, from land tenures and subsidy programs to fuel content rules.

c. Forestry

Just as the primary goal of energy policy has been to maintain access to affordable supplies, so too is forestry policy driven by the need to maintain a steady level of supplies, and at the right price. And as with energy, timber subsidies abound.

and Gasoline Cheaper, 12 AGRIC. & RES. ECON. UPDATE 1, 2 (Sept./Oct. 2008), available at www.agecon.ucdavis.edu/extension/update/articles/v12n1_1.pdf.

111. Mitchell calculated that three-quarters of the 140% price rise was due to biofuel production. See EIDE, *supra* note 109, at 14.

112. *Id.* at 4.

113. Howarth et al., *supra* note 92, at 8.

114. EIDE, *supra* note 109, at 12.

115. Runge, *supra* note 92, at 3.

With 84% of the world's forests publicly owned,¹¹⁶ governments have enormous constitutional power to facilitate industry growth through grants of land tenure, land use regulations, operating licenses, financial subsidies, enforcement practices, procurement policies, and so on. At every step of the way, governments oversee forest conversion.

The original subsidy to the logging industry was the granting of inexpensive and even free rights to cut timber. In the U.S., public forestlands were sold or given away through railroad land grants.¹¹⁷ In the nineteenth century, Congress granted huge tracts of land to many railroad companies in what is now considered to be one of the biggest public land giveaways in U.S. history. The justification for it was to provide railroad companies a base on which to raise the capital needed to build a transnational railway system needed to open up the frontier, connect new towns and cities, transport commodities and consumer goods, and spawn economic growth.¹¹⁸ The Northern Pacific railroad land grant, signed into law in 1864, gave some 40 million acres of public lands to Northern Pacific on the condition that all lands would be opened for homesteaders within five years of completion of the railroad.¹¹⁹ In the case of financial failure, all remaining grant lands were to be sold at local auction.¹²⁰ Northern Pacific did fail twice in 1873 and 1893, but the grant lands were never legitimately sold at local markets.¹²¹ Neither

116. FOOD & AGRIC. ORG. OF THE UNITED NATIONS, GLOBAL FOREST RESOURCES ASSESSMENT 5 (2005), *available at* <http://www.fao.org/forestry/fra/fra2005/en/>.

117. See Janel M. Curry-Roper, *The Impact of the Timber and Stone Act on Public Land Ownership in Northern Minnesota*, 33 J. FOREST HIST. 70 (1989).

118. See DERRICK JENSEN ET AL., RAILROADS AND CLEARCUTS: LEGACY OF CONGRESS'S 1864 NORTHERN PACIFIC RAILROAD LAND GRANT 8 (1995) (describing the nature of the land grant).

119. *United States v. Northern P.R. Co.*, 311 U.S. 311, 336 (1940) (discussing the congressional mandate and its conditions).

120. A Resolution authorizing the Northern Pacific Railroad Company to Issue its Bonds for the Construction of its Road and to secure the same by Mortgage, and for other Purposes, 16 Stat. 378 (1870) (describing the consequences of financial failure).

121. After the first financial failure, Northern Pacific reorganized such that "the existing mortgage was foreclosed, stock was substituted for outstanding bonds [on the grant lands], and assets, including the [land] grant, were bought by a committee of interested bond holders." JENSEN ET AL., *supra* note 118, at 12. After the second financial failure, the grant lands were sold, as required, at a

were they opened to settlement. Instead, millions of acres went cheap to large corporations.¹²²

These “private lands” were the primary source of early industry development. Only after these lands were depleted, did logging begin to pick up on public forest lands. The National Forest System was created in 1905 to manage the use of public forestlands,¹²³ but until the mid-1940s only 5% of the timber supply came from them.¹²⁴ This all changed with the increase in demand during World War II and the post-war building boom, a demand that was managed by a Forest Service that evolved from a custodian of the public forest to a “production agency.”¹²⁵

public sale to the highest bidder. However, J.P. Morgan, controller of Northern Pacific, and James J. Hill, owner of the Great Northern railroad, consolidated the two lines. The new Northern Pacific railway company was consistently the highest bidder. *Id.* at 12-14. The Supreme Court later held that the consolidation was an illegal restraint of trade in *Pearsall v. Great Northern Ry. Co.*, 161 U.S. 646 (1896). However, by making individuals rather than a corporation the owners of the new company, the ruling was subsequently bypassed. See JENSEN ET AL., *supra* note 118, at 13-14.

122. The land holdings of Plum Creek (the logging arm of Northern Pacific) and the interlinked companies of Weyerhaeuser, Potlatch, and Boise Cascade all came from the Northern Pacific land grant. Weyerhaeuser, for example, purchased 900,000 acres of Northern Pacific grant lands in Washington State in 1899. The current holdings of Plum Creek, Potlatch, and Boise Cascade are all based on the railroad grant lands. See JENSEN ET AL., *supra* note 118, at 3-4.

123. All public lands managed by the Forest Service are collectively known as the National Forest System. The beginnings of the National Forest System can be traced back to the Forest Reserve Act of 1891. In 1897 the Forest Management Act or Organic Act was enacted, defining the purposes of National Forests to be forest protection, predictable water supplies, and timber production. In 1905, 63 million acres of federal forest land were transferred from the Department of the Interior to the Department of Agriculture's Bureau of Forestry. The Bureau was subsequently renamed the Forest Service. Gifford Pinchot became the first chief forester who is renowned for instilling a culture of “wise use” into the agency and “conservation” rather than “preservation.” By 1910, the National Forests System had grown to 168 million acres. Today it stands at 191 million acres. See GERALD WILLIAMS, *THE FOREST SERVICE: FIGHTING FOR PUBLIC LANDS* 2-11 (2007); George A. Gonzalez, *The Conservation Policy Network, 1890-1910: The Development and Implementation of “Practical” Forestry*, 31 *POLITY* 269 (1998); Douglas MacCleery, *The National Forest System: Then and Now*, *EVERGREEN* (Winter 2000), available at http://evergreenmagazine.com/magazine/issue/Winter_2000.html.

124. CHARLES F. WILKINSON, *CROSSING THE NEXT MERIDIAN: LAND, WATER, AND THE FUTURE OF THE WEST* 141 (1992).

125. As stated by the U.S. Court of Appeals in the Monongahela National Forest case, *W. Va. Div. of Isaac Walton League of America, Inc. v. Butz*, 522

Between 1945 and 1966 the annual cut in National Forests increased from 1 billion to 12.1 billion board feet.¹²⁶ In response to this rapid acceleration of logging, the Multiple Use Sustained Yield Act was passed in 1960 with a mandate to consider a wider range of values for the forests including recreation, fish and wildlife habitat, and watershed protection.¹²⁷ How these values were to be reconciled, however, was left to the Forest Service and its productionist organizational culture. With ongoing erosion of forest lands, public environmental pressures led to the passage of the Wilderness Act (1964), and the setting aside of 9.1 million acres of wilderness under the National Wilderness Preservation System. This was the “first time in history that any national legislature in the world had mandated that land must be maintained in a pristine state.”¹²⁸ This public policy milestone was, however, compromised with most wilderness selections situated in rock and ice above the timberline, or in areas that were difficult for resource industries to access.¹²⁹

A decade later, with the environmental movement in high gear, the National Forest Management Act (1976) was passed following two high profile legal challenges to clear-cut logging practices in the Bitterroot and Monongahela National Forests.¹³⁰

F.2d 945 (4th Cir. 1975). See WILKINSON, *supra* note 124, at 143. Gonzalez notes that the National Forests were always managed according to “practical forestry” principles that emphasized the profitable harvesting but that, prior to the Second World War, the timber industry itself supported limited harvesting from National Forests to avoid depressing timber prices and destabilize the industry. In the process, restricting access and production in National Forests excluded small operators (who were dependent on public lands), leaving them available to the timber industry in the postwar period. See Gonzalez, *supra* note 123, at 269, 290-91.

126. WILKINSON, *supra* note 124, at 135-37.

127. The principle of sustained yield itself mandates the liquidation of (ostensibly slow growing, “decadent”) old growth forests so that they could be replaced by so-called “normal forests” of fast-growing, even-aged stands that could maintain the level of timber harvest in perpetuity. In its single-minded pursuit of steady volumes of forest “fibre,” the forest science to support this supply was, by today’s standards, primitive in its lack of understanding of the costs (in terms of loss of biodiversity, pests, fire, wood quality, etc.) of eroding ecosystem complexity and function.

128. WILKINSON, *supra* note 124, at 139.

129. See *id.*

130. See Charles F. Wilkinson, *National Forest Management Act: The Twenty Years Behind, the Twenty Years Ahead*, 68 U. COLO. L. REV. 659, 665 (1997).

The new Act amended the Forest Rangeland Renewable Resources Planning Act of 1974 and the Organic Act of 1897 in order to “improve the quality of multiple-use management planning on the national forests and to achieve better integration of management needs with funding.”¹³¹ Clear-cutting was to be used only where it was the “optimum” method of harvesting, and had to be protective of other resource values such as soil, water, fish wildlife, biodiversity, recreation, and aesthetics. Timber production, nevertheless, remained the general policy thrust with congressionally mandated harvest levels for each national forest.¹³² Arguments for increasing harvest levels were put forward on the grounds of economic efficiency, even though accelerated cutting was shown in many cases to result in below-cost sales. A 1994 Congressional report concluded that timber sales from 77 of the 120 national forests had lost money over a five year period with half of them losing money every year.¹³³

Decades of high-yield logging in the Bitterroot National Forest resulted in a range of environmental problems. In 1970, a report was commissioned to analyze logging in the area. The “Bolle Report” was critical of logging practices and concluded that “the basic principle of sustained-yield management was being violated.” *Id.* at 663. Congressional hearings on clearcutting ensued. This was followed in 1975 by the Court of Appeals decision in *Monongahela, W. Va. Div. of Izaak Walton League, Inc. v. Butz*, 522 F.2d 945, 948 (4th Cir. 1975), which found that clearcutting violated the 1897 Organic Act. Both events acted as catalysts for the enactment of the National Forest Management Act.

131. Charles Davis, *The Politics of Regulatory Change: National Forest Management Planning under Presidents Bill Clinton and George W. Bush*, 25 REV. POL’Y RES. 37, 38 (2008) (quoting PAUL W. HIRT, A CONSPIRACY OF OPTIMISM: MANAGEMENT OF THE NATIONAL FORESTS SINCE WORLD WAR TWO (1996)).

132. Some argue that the real intention of the Act was to get around the Monongahela National Forest ruling that banned clear-cut logging on significant portions of national forest land. See Miles Burnett & Charles Davis, *Getting out the Cut: Politics and National Forest Timber Harvests, 1960-1995*, 34 ADMIN. & SOC’Y 202, 209 (2002).

133. ROSS W. GORTE, BELOW-COST TIMBER SALES OVERVIEW 39 (1994), available at <http://cnie.org/NLE/CRSreports/forests/for-1.cfm>. In an updated version of the report, the author points to a variety of reasons for selling timber including maintaining supplies of timber for local mills that maintain employment, reducing fuel loading on the forest floor, and altering the mix of tree species. ROSS W. GORTE, BELOW-COST TIMBER SALES OVERVIEW (2004), available at <http://www.nationalaglawcenter.org/assets/crs/RL32485.pdf>. See generally THOMAS J BARLOW & NATURAL RES. DEF. COUNCIL, GIVING AWAY THE NATIONAL FORESTS: AN ANALYSIS OF U.S. FOREST SERVICE TIMBER SALES BELOW COST (1980).

Subsidies for road access were a key reason for the losses, with the Forest Service subsidizing the engineering, design, and construction of literally hundreds of thousands of miles of logging roads.¹³⁴

Despite the introduction of the Multiple Use Sustained Yield Act, the National Forest Management Act, and an array of protective environmental laws,¹³⁵ the timber harvest remained relatively steady into the 1990s at around 11 billion board feet.¹³⁶ William Robbins notes, “in almost every legislative and regulatory ‘conservation’ measure adopted at the federal level, the needs of America’s expanding industrial economy is apparent.”¹³⁷ Reflecting on the situation, Wilkinson concluded:

The Forest Service will ensure amenity values, first-rate timber-harvesting practices, unroaded backcountry, fish and wildlife protection, economically justifiable sales and even protection for the spotted owl . . . *to the extent permitted by an allowable cut of 11 billion board feet.* The quality of all Forest Service programs is limited by the cut.¹³⁸

A parallel situation can be seen in Canada with the early land giveaways and unregulated exploitation followed by a multiple-use sustained yield paradigm. And just as in the American situation, the goal of sustained yield maximization dominates throughout.¹³⁹ With 94% of the forests in Canada publicly owned, the same state-corporation, management-

134. In 2004, this subsidy was represented by a presidential budget request to Congress of nearly \$34 million. NAVIN NAYAK ET AL. & FRIENDS OF THE EARTH, GREEN SCISSORS REPORT 2004 16 (2004).

135. For example, the Endangered Species Act and Clean Water Act both have significant impacts on forestry practices.

136. WILKINSON, *supra* note 124, at 146.

137. WILLIAM G. ROBBINS, LUMBERJACKS AND LEGISLATORS: POLITICAL ECONOMY OF THE US LUMBER INDUSTRY, 1890-1941 11 (1982).

138. WILKINSON, *supra* note 124, at 158. With declining levels of old growth forests and increasing public environmental consciousness, the National Forest timber supply dropped to less than 4 billion board feet in the latter 1990s and continued to decline to 2.6 billion board feet by 2010. FED. FOREST RES. COAL., IS FEDERAL TIMBER STILL IN DEMAND? 5 (2011), *available at* <http://www.foresthealth.org/pdf/Federal%20Timber%20Demand%20Feb%202011.pdf>.

139. See Chris Tollefson, *Introduction* to THE WEALTH OF FORESTS 5-10 (Chris Tollefson ed., 1998).

production linkages are apparent. One of Canada's largest industries, forestry, provides a major source of employment and wages and an important source of foreign exchange earnings.¹⁴⁰ Royalties from timber sales have historically been the largest source of revenue for several provincial governments.¹⁴¹ This state-production linkage is most clearly demonstrated in the province of British Columbia (BC) where forestry was long the main driver of the provincial economy.¹⁴² With the highest rate of logging in Canada, BC companies cut over 90 million cubic meters of timber in 2005-2006, and accounted for 7% of employment and 15% of all economic activity in 2006.¹⁴³ Government revenues from the BC forest industry in the form of royalties,¹⁴⁴ rents, and taxes amount to several billion dollars annually. Between 2000-2002, timber-based industries contributed an average of \$8.4 billion annually in GDP to the provincial economy.¹⁴⁵

140. The forest industry accounted for nearly 75% of Canada's entire surplus on merchandise trade well into the 1990s. See MELODY HESSING ET AL., CANADIAN NATURAL RESOURCE AND ENVIRONMENTAL POLICY 166 (1997).

141. *Id.* at 49. In Canada, most matters pertaining to land and resources fall under provincial rather than federal jurisdiction.

142. BRITISH COLUMBIA (MINISTRY OF FORESTS), THE STATE OF BRITISH COLUMBIA'S FORESTS 7 (2006).

143. *Id.* at 8, 70. Figures include indirect and induced economic activity. By comparison, in 1996, approximately 20% of all jobs in the province and 25% of the provincial GDP were dependent on the forest sector. British Columbia (BC Stats), *Business Indicators December 2001*, at 4, available at <http://www.bcstats.gov.bc.ca/Publications/PeriodicalsReleases/BusinessIndicators.aspx> (follow the links to 2001 and Dec.).

144. Public revenues are generated through stumpage. Often priced at only a few cents on the cubic meter to keep logging costs low and amounting to only a small part of forestry's total contribution to government coffers, the total typically hit around \$1 billion a year up to 2008. However, revenues declined considerably following the economic downturn of 2008. See The Council of Forest Industries, *BC Forest Product Industry at a Glance* (2012), <http://www.cofi.org/wp-content/uploads/2011/12/Copy-of-COFI-BC-Ind-At-A-Glance-2011-March-31-20122.pdf> (last visited May 21, 2012).

145. BRITISH COLUMBIA (MINISTRY OF FORESTS), *supra* note 142, at 134-35. Timber-based industries include forestry and logging, wood product manufacturing, and pulp and paper production. *Id.* The role of forestry and logging in BC's economy has declined significantly in recent years due to a number of factors including the downturn in the U.S. housing market, a protracted softwood lumber dispute with the U.S., the mountain pine beetle epidemic, and decades of over logging. *Id.*

The driving force of forest policy has always been the need for corporate-based economic growth.¹⁴⁶ The tenure system, the province's major policy instrument, was conceived as a broad state-directed strategy of economic development which gave large discretionary power to a handful of powerful corporate actors.¹⁴⁷ There was minimal need to resort to coercive regulatory actions since the government's primary concerns were to facilitate the province's economic development and maintain the stability of hinterland communities.¹⁴⁸ For the same reason, stumpage rates were kept low while annual harvest rates were set well above the so-called sustained yield. However, as old growth forests disappeared, forestry conflicts began to erupt.¹⁴⁹ Rising pressure from First Nations and environmentalists in the 1990s combined with the critique of the inability of existing forestry policy to promote long-term prosperity in forestry-based communities, led to demands for policy and tenure reform.¹⁵⁰ Nevertheless, the election of the left-leaning New Democratic Party in the early 1990s led to limited structural reform (for example, the corporate tenure system was left untouched) because of the power of large forest corporations.

146. See, e.g., R. Michael McGonigle, *Structural Instruments and Sustainable Forests: A Political Ecology Approach*, in *THE WEALTH OF FORESTS*, *supra* note 139; see also PATRICIA MARCHAK ET AL., *FALLDOWN: FOREST POLICY IN BRITISH COLUMBIA* (1999).

147. The tenure system is a set of contractual property rights whereby the government retains ownership of the land while licensees get ownership of the timber subject to a royalty fee or payment of stumpage upon cutting.

148. Requirements to facilitate these goals included the "use it or lose it" rule, which required a licensee to use its assigned quota or forfeit it, and the "appurtenance" clause, which generally required a tenure holder to build and maintain a mill as a condition of receiving a tenure.

149. Among the most well-known is the 1993 battle at Clayoquot Sound, the site of the largest mass arrest in Canadian history at the time with 800 people charged. See *A POLITICAL SPACE: READING THE GLOBAL THROUGH CLAYOQUOT SOUND* 42 (Warren Magnusson & Karena Shaw eds., 2003).

150. See TREVOR BARNES & ROGER HAYTER, *TROUBLES IN THE RAIN FOREST* (1997); R. MICHAEL M'GONIGLE ET AL., *WHEN THERE'S A WAY, THERE'S A WILL – DEVELOPING SUSTAINABILITY THROUGH THE COMMUNITY ECOSYSTEM TRUST* (2001); MARCHAK ET AL., *supra* note 146. For a study on the economic benefits of community-based sustainable forestry, see PACIFIC ANALYTICS INC., & DON HARRISON, *REVITALIZING BRITISH COLUMBIA'S COASTAL ECONOMY: A NEW ECONOMIC VISION FOR THE NORTH AND CENTRAL COAST AND HAIDA GWAIH* (2002), available at www.pacificanalytics.ca.

The situation in the forests globally is even more extreme. On the Indonesian island of Borneo, over 30% of the forest cover has been removed in the past two decades for timber exports and the development of agricultural plantations.¹⁵¹ While nominally “private” companies have done the cutting, local and national governments have facilitated forest liquidation through granting and renewing licenses that largely determine the rate of deforestation.¹⁵² Here, too, government provides generous subsidies to implement its official policy of opening up 90% of its landmass for commercial logging and conversion to agriculture and settlement.¹⁵³ The Malaysian government has recently licensed nearly a quarter of the state’s land mass to a dozen logging companies to convert natural tropical forest into plantations for the export of palm oil, one of the little known but most destructive of agricultural commodities.¹⁵⁴

Profits here accrue both to large corporations and the state. The timber industry has been the economic backbone of economic development across the region, and royalties have been an important source of income for state governments. The revenue generated by tenures, licenses, and taxes has been enormous,

151. In the mid-1980s, forest covered nearly three-quarters of Borneo, but at the rate of harvest over the last twenty years, less than one-third of the island would remain forested in 2020. MARIO RAUTNER ET AL. & WWF, BORNEO: TREASURE ISLAND AT RISK 73 (2005).

152. *Id.* at 40 (6:6:1 policy). In Sarawak, concessions are usually awarded by the ruling elite to political allies, relatives, and business partners, and then sub-leased to contractors (usually Chinese) who put them into operations. Thus, the forests are a locus of not only economic but political power, giving political elites the economic resources to maintain their grip on state power. See Amarjit Kaur, *A History of Forestry in Sarawak*, 32 MOD. ASIAN STUD. 117, 140 (1998).

153. RAUTNER ET AL, *supra* note 151, at 46; see also CHARLES BARBER ET AL., THE STATE OF THE FOREST: INDONESIA (2002).

154. FRIENDS OF THE EARTH, MALAYSIAN PALM OIL - GREEN GOLD OR GREEN WASH? 5 (2008), available at http://www.foeeurope.org/sites/default/files/publications/malaysian-palm-oil-report_0.pdf. Global palm oil production is increasing by 9% every year, prompted largely by expanding biofuel markets in the EU and by food demand in Indonesia, India, and China. Fitzherbert et al., *supra* note 109, at 538-45. The conversion of forests to palm oil plantations has been dramatic. In Malaysian Borneo, the average annual growth rate of oil palm areas was nearly 8% between 1998 and 2003. Over 1.6 million ha of oil palms now exist in Sabah and Sarawak. In Kalimantan, the areas used by palm plantations grew by 11.5% to nearly a million ha in 2003. RAUTNER ET AL, *supra* note 151, at 7.

with a number of state-owned forestry corporations profiting directly from timber sales.¹⁵⁵ In the Malaysian state of Sabah, on the island of Borneo, the industry has at times generated more than half of the state's total revenue, while employing some 65,000 people.¹⁵⁶ In neighboring Sarawak, the forest industry sector is the largest source of revenue for the state producing 21% of total external earnings.¹⁵⁷ In Kalimantan, exports of wood-related products accounted for \$7.6 billion in 2002 alone.¹⁵⁸

From the North to South, developing to industrialized countries, an inherent conflict-of-interest arises with the management of public forests. The responsibility for protecting values that do not generate economic returns lies with governments that also depend on the economic royalties, revenues, and export dollars that arise from forest liquidation. The inevitable conundrum is how the state, as the major landowner and rent-collector, might also fulfill the duties of a regulator where sustainable management might necessitate reductions in jobs, corporate profits, and/or government revenues.

d. Agriculture

Agriculture provides another instance where government policies have played a major role in the development of an economically "efficient" industrialized production system despite its environmental and social costs. Just as industrial forestry policy has emphasized maximum sustained yield of timber, so too has the primary goal of industrial agriculture been maximum sustained yield of single commodity crops. The past century has seen the agricultural system in most northern countries become increasingly concentrated, specialized, and industrialized. This is particularly the case in the U.S., where 98% of the food supply now comes from agribusiness-run, industrial farms specializing in high-yielding monocultures using chemically-intensive farming

155. In Sarawak, the Sarawak Forestry Corporation was set up as a private company, wholly owned by the Sarawak State Government. RAUTNER ET AL., *supra* note 151, at 40.

156. *Id.* at 58. Figure is for employment in the year 2000.

157. *Id.*

158. *Id.*

methods.¹⁵⁹ Downstream, corporate agriculture and food processing has been linked to growing levels of obesity, heart disease, and diabetes in Northern countries, and malnutrition and hunger in the South.¹⁶⁰

Agricultural policy in the U.S. has long emphasized agricultural exports as a means of generating income. As the push for commercial agriculture strengthened in the mid-nineteenth century, scientific methods were turned to as a means of increasing production. In 1862, the newly formed U.S. Department of Agriculture (USDA) passed the Morrill Land Grant College Act, which established agricultural colleges and supported research into industrialized farming methods.¹⁶¹

When the depression-era farm crisis hit in the 1930s, the first agricultural bill was enacted as a temporary measure to protect small farms.¹⁶² The goal of the Agricultural Adjustment Act of 1933 was to increase and stabilize farm incomes which it tackled in large part through price supports for over 100 crops.¹⁶³ In the following three years, these measures pushed gross farm incomes up by some 50%, much of this increase resulting from

159. Kathryn Peters, *Creating a Sustainable Urban Agriculture Revolution*, 25 J. ENVT'L. L. & LITIG. 203, 207 (2010).

160. William Eubanks II, *Paying the Farm Bill: How One Statute Has Radically Degraded the Natural Environment and How a Newfound Emphasis on Sustainability is the Key to Reviving the Ecosystem*, 27 ENVT'L. F. 55, 56 (2010); see also DANIEL IMHOFF, *FOOD FIGHT: THE CITIZEN'S GUIDE TO A FOOD AND FARM BILL* (2007); RAJ PATEL, *STUFFED AND STARVED* (2007).

161. New agricultural developments were disseminated to farmers through the "Cooperative Extension Services," a non-formal educational program established by the Smith-Lever Act of 1914 with farmers expected to follow recommendations for industrialized farming put forward by government-sponsored researchers. As this report notes, tensions arose that continue to this day since "public universities are often seen as promoting corporate priorities instead of an unbiased form for debate on what research is in the public interest." DENNIS KEENEY & LONI KEMP, *A NEW AGRICULTURAL POLICY FOR THE UNITED STATES* 6 (2003).

162. This farm crisis in part arose from an overproduction of crops in the 1920s leading to a steep drop in crop prices. See IMHOFF, *supra* note 160, at 33-34.

163. Such commodity programs continue to be the most significant provision in U.S. farm bills in terms of budget expenditure and political importance. Larry Burmeister, *Resilience and Vulnerability in US Farm Policy: Parsing the Payment Limitation Debate*, 25 AGRIC. & HUM. VALUES 183, 183 (2008).

government subsidies.¹⁶⁴ Over time, however, the commodity programs produced increasing concentration and specialization as subsidy payments were based on the production histories of each farm and, as a result, “were scale-biased toward larger farming operations and provided incentives for farmers to expand base acreage in program crops.”¹⁶⁵ Under the influence of a growing farm lobby, the number of crops supported by commodity subsidies gradually declined to only a handful that provided most of their benefit to the big players. As the world market in basic agricultural commodities expanded in the post-war period, individual farmers were required to “aggressively optimize their agricultural operations” in order to compete in an increasingly competitive global market.¹⁶⁶ This was achieved through large-scale specialization and monoculture cultivation, made possible by the widespread use of external chemical fertilizers, pesticides, and enormous amounts of water. Public research again played a large role in developing and promoting the use of these external inputs, together with high-yielding hybrid seeds and mechanization.¹⁶⁷

By the 1970s, agricultural progress began to be measured almost solely in terms of increases in commodity crop yields. The drive for mega-farms and maximum production was promoted by U.S. Secretary of Agriculture, Earl Butz, whose vision of maximum production was summed up by his motto: “Get big or get out.”¹⁶⁸ At the same time, supply management programs, which had been an important part of preceding farm bills, were replaced by direct subsidy payments to farmers. The result was a seemingly limitless supply of U.S. farm products that could be sold at lower prices on the world market.¹⁶⁹ These policies were justified in terms of helping farmers remain economically viable,

164. Eubanks, *supra* note 160, at 58.

165. Burmeister, *supra* note 163, at 184.

166. Frederick Buttel, *Sustaining the Unsustainable: Agro-food Systems and Environment in the Modern World* in HANDBOOK OF RURAL STUDIES 216 (Paul J. Cloke et al. eds., 2006).

167. *Id.* at 216.

168. Tom Philpott, *The Butz Stops Here: A Reflection on the Lasting Legacy of 1970's USDA Secretary Earl Butz*, GRIST (Feb. 7, 2008), <http://www.grist.org/article/the-butz-stops-here/>.

169. Burmeister, *supra* note 163, at 184.

but the major beneficiaries were multinational agribusinesses, such as Cargill, ADM, Monsanto, and John Deere.¹⁷⁰ By the 1980s, the policy of maximum production led to overproduction and falling commodity prices which combined with skyrocketing interest rates to produce “the deepest rural crisis since the Depression.”¹⁷¹ Many farms went bankrupt, leading to further consolidation in fewer and larger farms.¹⁷² Under the influence of a powerful agribusiness lobby, the number of crops receiving price supports fell drastically to the point where only five crops—corn, cotton, rice, soybeans, and wheat—now receive 84% of the commodity subsidies.¹⁷³ Rather than providing a safety net for working farmers as originally intended, commodity programs have become “a far flung infrastructure of entitlements.”¹⁷⁴

The farm subsidy program has also benefited industrial livestock operations. Since the Federal Agriculture Improvement and Reform Act of 1996, the market price of soybeans and corn has dropped below the cost of producing them.¹⁷⁵ Between 1997

170. Burmeister notes that “firms are subsidized by commodity programs through the indirect route of lower world market prices and higher aggregate production levels than would occur in the absence of commodity programs, increasing the profitability of their input supply, marketing, and processing businesses.” *Id.* at 184.

171. Philpott, *supra* note 168, at 1.

172. Between 1950 and 1997, the number of farms in the U.S. declined from 5.4 million to 1.9 million. Whereas one farm supported the food needs of 15.5 people in 1950, one farm could support 140 people by 1997. USDA, *About Us*, at ¶14, available at <http://www.csrees.usda.gov/qlinks/extension.html#yesterday> (last visited May 22, 2012).

173. Eubanks, *supra* note 160, at 60.

174. *Id.* (internal punctuation omitted). Eubanks notes that \$25 billion were paid out in farm subsidies in 2005, “almost 50% more than the amount [the federal government] pays to families receiving welfare.” *Id.* at 61. At the same time, approximately 67% of these subsidies went to the wealthiest 10% of recipients, “namely large corporations, non-farming homeowners, and absentee landowners.” *Id.* While three out of five farms receive no subsidies, the richest 5% receive \$470,000 per year on average. *Id.*

175. ELANOR STARMER ET AL., *FEEDING THE FACTORY FARM: IMPLICIT SUBSIDIES TO THE BROILER CHICKEN INDUSTRY* 11 (2006). The 1996 Farm Bill based payments to farmers primarily on the quantity of the commodity grown decoupled from supply management provisions. The Government based this policy on the projection that the Uruguay Round trade talks would lead to an increase in commodity exports. Instead, the policy stimulated overproduction and a collapse in commodity prices. The policies continued in the 2002 Farm Bill (i.e., the Farm Security and Rural Investment Act of 2002, P.L. 107-171) as

and 2005, corn was sold at 23% below production cost while soybeans were sold at 15% below production cost.¹⁷⁶ This converts into big gains for those industries that use these commodities as raw material inputs, such as factory farms and the food processing industry. Olson reports that between 2000 and 2004, commodity subsidies totaled an average of \$4.5 billion per year for corn and \$2 billion per year for soy.¹⁷⁷ As 60% of corn and 47% of soy produced in the U.S. is used as animal feed, the embedded subsidy to factory livestock production works out to \$3.6 billion per year, or \$18 billion over five years.¹⁷⁸ Such figures suggest that “[c]urrent U.S. farm policies may be driving industrialization in the livestock production system if they give factory operations the appearance of being more cost efficient than diversified, independent operations that grow their own feed.”¹⁷⁹

prices continued to plummet. See Burmeister, *supra* note 163, at 184; Matthew Porterfield, *U.S. Farm Subsidies and the Expiration of the WTO's Peace Clause*, 27 U. PA. J. INT'L ECON. L. 999, 1002-04 (2006).

176. STARMER ET AL., *supra* note 175, at 3.

177. INST. FOR AGRIC. & TRADE POLICY, *Below-cost Feed Crops: An Indirect Subsidy for Industrial Animal Factories* (June 2006), available at http://www.iatp.org/files/258_2_88122_0.pdf.

178. *Id.* These figures are supported by STARMER ET AL., *supra* note 175, at 3-4, who calculate that between 1997-2005, the broiler chicken industry gained an average of \$1.25 billion in indirect subsidies each year, and suggest that similar cost reductions were reaped by factory hog feeding operations.

179. STARMER ET AL., *supra* note 175, at 1. Vertical integration, consolidation, and industrialization of the U.S. livestock sector have been facilitated by U.S. agricultural market deregulation. The result is heavy concentration in the agri-food industry. The Institute for Agriculture and Trade Policy notes that “[only] [f]our companies – Cargill, ConAgra, Tyson and Smithfield – control the vast share of livestock markets at all stages of production – from milling the feed, to breeding and raising animals, to slaughtering, packing, and marketing.” INST. FOR AGRIC. & TRADE POLICY, *supra* note 177, at 2; see also PHILIP MATTERA, USDA INC.: HOW AGRIBUSINESS HAS HIJACKED REGULATORY POLICY AT THE U.S. DEPARTMENT OF AGRICULTURE (2004), available at <http://www.citizen.org/documents/USDAInc.pdf>. He notes that when the top four firms control 40% or more of the market there is a strong potential for market distortion. According to his research, “the top four firms typically control 60-80 percent or more of the market in sectors such as beef packing, pork packing, broiler production, flour milling and soybean crushing.” *Id.* at 12; see also MARY HENDRICKSON & WILLIAM HEFFERNAN, CONCENTRATION OF AGRICULTURAL MARKETS (2007), available at <http://www.foodcircles.missouri.edu/07contable.pdf>.

In addition to these production effects are the environmental impacts. Agriculture accounts for one fifth of all fossil fuels usage in the U.S.,¹⁸⁰ as well as a massive reliance on chemical fertilizers, toxic biocides, and large-scale irrigation that has resulted in a serious decline in water quality and quantity. Much of the nitrogen and phosphorous rich fertilizers applied to fields end up in streams and rivers, creating threats to public health as well as harm to aquatic species. Their impacts can reach far beyond the farm as nutrients travel toward the ocean leading to eutrophication and expansive dead zones.¹⁸¹ One of the worst examples of this is the Gulf of Mexico, which has a “dead zone” that reaches up to 8,000 square miles.¹⁸² Further, with their use nearly tripling since 1964, pesticides were found in 60% of shallow wells in agricultural areas.¹⁸³ Large quantities of manure are yet another source of water contamination. As a result of “concentrated animal feeding operations” (CAFOs), livestock in the U.S. now produce 200 times more waste than humans.¹⁸⁴ Manure applied to fields as fertilizer eventually runs off into surface waters, in many cases at high enough levels to kill

180. IMHOFF, *supra* note 160, at 102. This figure includes the fossil fuel usage for growing, processing, and distributing the food.

181. Nitrogen and phosphate are superfood for plankton, causing them to quickly reproduce before dying and falling to the bottom of the ocean. There, bacteria decompose them, consuming oxygen in the process. When oxygen concentrations decrease to a certain level, the water takes on the effects of hypoxia or oxygen shortage and aquatic life either leaves the area or dies. See ALANNA MITCHELL, *SEASICK: OCEAN CHANGE AND THE EXTINCTION OF LIFE ON EARTH* 16-33 (2009).

182. In 2011, the dead zone reached 6,765 square miles. The largest dead zone was recorded in 2002, at 8,484 square miles. See Buskey & Nikki, *Experts Say More is Needed to Stop Dead Zone*, HOUMA COURIER (Aug. 7, 2011), available at <http://www.gulfhypoxia.net/news/default.asp?XMLFilename=201108230835.xml>; *Hypoxia in the News*, MISS. RIVER GULF OF MEX. WATERSHED NUTRIENT TASKFORCE, <http://water.epa.gov/type/watersheds/named/msbasin/gulfnews.cfm> (last visited May 22, 2012).

183. However, only 1% of wells tested were deemed to have “unsafe” levels of pesticides. U.S. ENVTL. PROT. AGENCY, REPORT ON THE ENVIRONMENT DATABASE 12 (2011), available at http://www.epa.gov/ncea/roe/docs/roe_hd/roe-hd-final-09-2008-ground_water.pdf.

184. J.B. Ruhl, *Farms, their Environmental Harms, and Environmental Law*, 27 *ECOLOGY L.Q.* 263, 285 (2000).

fish.¹⁸⁵ Although farms are the major source of non-point source water pollution in the U.S., they enjoy a range of exemptions under the Clean Water Act.¹⁸⁶ Buttel notes that “if environmental regulatory authorities were to apply to agriculture the same standards and penalties employed in regulation of industrial pollutants, the penalties for noncompliance with regulations would render monocultural and CAFO production very expensive.”¹⁸⁷

Meanwhile, agriculture continues to be the largest consumer of water, accounting for around two-thirds of all freshwater usage in the U.S.¹⁸⁸ Despite the increasing frequency of water shortages in the U.S., agricultural policy continues to favor commodity crop farming over low-water farming strategies. However, as the next section shows, it is not only agriculture but the entire industrial economy that is dependent on a readily available source of cheap and abundant water. And, once again, government policy has worked to make it happen.

e. Water

The phrase “water conservation” commonly brings to mind low-flow plumbing fixtures, short showers, drought resistant urban gardens, and so forth. Yet, in the U.S., nearly 90% of all freshwater is consumed by agriculture and industry.¹⁸⁹ Moreover, the U.S. is the highest per capita consumer of water in the world.¹⁹⁰ Excluding thermoelectric power,¹⁹¹ irrigation

185. *Id.* at 285-86. Ruhl notes that the concentration of ammonia in creeks in California’s Central Valley is often 200 times the level that is toxic to fish. Eubanks, *supra* note 160, at 65 (recalling the bursting of a waste lagoon in North Carolina in 1995 that resulted in the release of thirty-five million gallons of hog sewage into the New River and the death of nearly ten million fish).

186. The Clean Water Act focuses on “point sources” of pollution for the National Pollutant Discharge Elimination System program, failing to regulate nonpoint sources of water pollution deriving from industrial agriculture. See Ruhl, *supra* note 184, at 295-303.

187. Buttel, *supra* note 166, at 223.

188. This does not include thermoelectric power use. See SUSAN HUTSON ET AL., ESTIMATED USE OF WATER IN THE UNITED STATES IN 2000 (U.S. Geological Survey Circular 1268) 35 (2004), available at <http://pubs.usgs.gov/circ/2004/circ1268/pdf/circular1268.pdf>.

189. CAHN, *supra* note 59, at 65.

190. *Id.*

accounted for 65% of freshwater withdrawals in 2000, with 86% of this occurring in 17 western states.¹⁹² To meet this demand, rivers and streams have been diverted and dammed while industrial wastewater has been allowed to pollute groundwater, leaving many major rivers in the Western U.S. badly depleted. A key to understanding the unsustainable use of water lies in a long history of water law that shifts water from a public resource to private property. This history was long based on riparian rights, which gave use rights to water based on ownership of land adjacent to a shoreline. At the same time, water was viewed as common property and beyond ownership, giving those downstream equal rights to use the water as those upstream.¹⁹³ Central to this water allocation regime was the concept of “no harm,” which dictated that “riparian landowners could use water so long as they did not substantially impair either the quantity or quality of water for downstream users.”¹⁹⁴ While the intention of the regime was to protect the water rights of downstream users, it also indirectly provided protection for aquatic ecosystems by ensuring a minimum flow of water.¹⁹⁵ This system was adopted by and continues to be used in the Eastern U.S. where water is relatively abundant.

By the mid-nineteenth century, however, the riparian rights system was inadequate to meet the water demands of emerging industrialism in the arid west. In its place, the doctrine of “prior appropriation” arose, replacing the communal right to water with

191. Thermoelectric power is often excluded from water use calculations since most of the water at power plants is used for once-through cooling, and is returned to the surface water source once it has circulated through the system. See HUTSON ET AL., *supra* note 188, at 35.

192. *See id.* at 7. The breakdown of total water withdrawals (both surface and groundwater) as reported by Hutson et al. are: thermoelectric 48%, irrigation 34%, public supply 11%, self-supplied industrial 5%, and combination of self-supplied domestic, livestock, aquaculture, and mining 2%. *Id.*

193. Chad A. West, *For Body, Soul, or Wealth: the Distinction, Evolution, and Policy Implications of Water Ethic*, 26 STAN. ENVTL. L.J., 201, 219-20 (2007).

194. This was later modified to the “reasonable use doctrine,” which allowed for more significant water withdrawals to promote large-scale agriculture and industry if they were “reasonable relative to the equivalent right of other riparian landowners.” Robert Adler, *Climate Change and the Hegemony of State Water Law*, 29 STAN. ENVTL. L.J. 1, 18-19 (2010).

195. *Id.* at 18.

individual property rights.¹⁹⁶ To obtain a water right under traditional prior appropriation principles, the water first had to be diverted from its natural course for a “beneficial use.” However, “beneficial use” was defined strictly in terms of economic benefit,¹⁹⁷ putting aquatic ecosystems, as well as those who depended on the naturally flowing river for their livelihoods, at a real disadvantage.¹⁹⁸ Water-right holders obtained property rights to a defined “amount, time, location, purpose and temporal priority of use.”¹⁹⁹ This assurance of continued access to water was seen as necessary in order for investors to put money into expensive diversion projects. But with its heavy emphasis on water extraction and guarantee to senior users for a specified quantity of water, there was no incentive for conserving water. On the contrary, the “use it or lose it” tenet of prior appropriation provided a strong incentive for users to fully exercise their water rights even if use exceeded their needs.²⁰⁰

By the 1880s, it became increasingly difficult to meet the escalating demands of irrigators. As a result, the water needs of junior water rights holders suffered during dry seasons. At the same time, without a guaranteed supply of water, homesteading in the west slowed. This was a major setback for the

196. The origins of the law can be traced back to the California gold rush and a dispute over water between two miners which went to the Supreme Court of California in 1855. *Irwin v. Phillips*, 5 Cal. 140 (1855). In its decision, the court essentially recognized the “first in time, first in right” rule governing the mining camps. Thus, “a legal system that arose from the relatively lawless mining camps of the Wild West would come to be viewed as though it had been handed down directly from God.” Reed Benson, *A Few Ironies of Western Water Law*, 6 WYO. L. REV. 331, 333 (2006).

197. Benson, *supra* note 196, at 332. Until recently, beneficial uses were defined only in terms of “human economic purposes at the expense of instream users and other environmental uses.” Adler, *supra* note 194, at 22.

198. Those most notably impacted by this requirement were the Native Americans who were commonly left without the water resources they had relied on for millennia. Benson, *supra* note 196, at 332.

199. Joseph Dellapenna, *United States: The Allocation of Surface Waters*, in *THE EVOLUTION OF THE LAW AND POLITICS OF WATER* 196 (J.W. Dellapenna & J. Gupta eds., 2009). These water rights typically last forever, assuming the right’s holder fully exercises his or her right. Benson, *supra* note 196, at 34-35.

200. The purported reason for this is to ensure water is not being “wasted” by preventing water rights from being held for speculative purposes only. Adler, *supra* note 194, at 22.

government's aspiration of western expansion and development. Consequently, the government stepped in with the Reclamation Act of 1902, "one of the most influential statutes in the history of the American West."²⁰¹ The Act provided federal funding for large-scale water projects in the west, including dams, reservoirs, and canals. It respected all existing prior appropriation rights while creating vast new reservoirs that could provide secure water rights for new users. The Act was itself a metaphor for growth solving all the problems of conflict and inequity, and doing so at the expense of the natural environment. As a result, "[l]and entries spiked to their highest levels ever in the early twentieth century."²⁰² At the same time, the landscape and ecology of the west was radically changed, with several dams sited on almost every major river.²⁰³ Robert Glennon remarks:

By the time the frenzy of dam building came to an end in the 1960s, most of the great rivers in the American West had been transformed into quiet millponds – storage reservoirs that served the needs of Western farms. None of these projects would have been undertaken by the private sector because they made absolutely no economic sense. But the federal government was less interested in cost-benefit ratios than in encouraging the development of agricultural communities throughout the West.²⁰⁴

201. Charles Wilkinson, *Introduction to the Culture of Water Symposium*, 6 WYO. L. REV. 287, 289 (2006).

202. *Id.* Such water developments led to notorious cases of deception and corruption. One of the more extreme cases occurred with California's Central Valley Project, a massive project to divert the Owens River to provide water to Los Angeles. However, four times the amount of water actually required for Los Angeles was pumped out of Owens Valley, with the excess water diverted to the San Fernando Valley which it transformed from arid desert into fertile agricultural land. Insiders who had bought up cheap land reaped a windfall as the Owens River was virtually drained. For a rich account, see MARC REISNER, *CADILLAC DESERT: WATER AND THE TRANSFORMATION OF NATURE* 2 (1993).

203. There were nearly 10,000 reservoirs with a storage capacity of at least 100 acre-feet, while another 20,000 smaller reservoirs and stockponds brought the grand total to over 30,000 dams. See DAVID GILLIAN & THOMAS BROWN, *INSTREAM FLOW PROTECTION: SEEKING A BALANCE IN WESTERN WATER USE* 40 (1997).

204. Robert Glennon, *Water Scarcity, Marketing and Privatization*, 83 TEX. L. REV. 1873, 1898-99 (2005).

By the time legal protection for instream flows was recognized in the 1970s, many of the major western rivers were depleted and running almost dry in the summer.²⁰⁵ Even with their introduction, instream flow protection policies are generally limited to protecting what is left of a river by setting aside unappropriated water or bringing in environmental concerns under new water rights.²⁰⁶ With most western streams already fully appropriated and the recognition of permanent property rights to water under prior appropriation, the acquisition and transfer of existing water rights to instream flows is difficult and costly.²⁰⁷ Some recourse for instream flow protection has been provided through the Endangered Species Act, which accords protection of endangered species priority over water use.²⁰⁸ At the same time, the Act prohibits any water user from causing a “take” of an endangered species, but it has yet to have much impact on water use. Reinforcing such inaction, the court in *Tulare Lake Basin Water Storage District v. United States* found for the first time that “restrictions imposed under the ESA amounted to a taking of private property.”²⁰⁹ Once again, the

205. These include the Snake River in Idaho, Salt River in Arizona, the Rio Grande in New Mexico, the Arkansas River in Colorado, and the San Joaquin River in California, several of them located below a major dam. See GILLIAN & BROWN, *supra* note 203, at 40.

206. See Reed Benson, *Adequate Progress or Rivers Left Behind? Developments in Colorado and Wyoming Instream Flow Laws Since 2000*, 36 ENVTL. L. 1283, 1301-02 (2006).

207. See *id.* at 1302 (comparing instream flow protection in Colorado, one of the most active states in protecting flows, and Wyoming where such protection “is at best a low priority.”). Benson concludes that even in Colorado, where the legislative toolbox has greatly expanded, practical progress to date has been inadequate. *Id.* For a general overview of environmental flow policy, see Lawrence MacDonnell, *Return to the River: Environmental Flow Policy in the United States and Canada*, 45 J. AM. WATER RESOURCES ASSOC., 1087 (2009).

208. Landmark cases such as *Tennessee Valley Authority v. Hill*, 437 U.S. 153 (1978), which stopped the completion of the Tellico Dam on the Little Tennessee River in order to protect the endangered Snail darter, or the threat of enforcement of section 9 of the Endangered Species Act against irrigators in the Walla Walla River Basin appear to hold out promise for inflow water protection. See Reed Benson, *So Much Conflict, Yet So Much in Common: Considering the Similarities Between Western Water Law and the Endangered Species Act*, 44 NAT. RESOURCES J. 29, 44-45 (2004).

209. Benson, *supra* note 206, at 45; *Tulare Lake Basin Water Storage Dist. v. United States*, 49 Fed. Cl. 313, 314 (2001).

allocation of property rights to water use under prior appropriations stands in the way of effective environmental action. Nevertheless, despite much criticism over the past several decades, prior appropriation continues to be the foundation of western water law.

C. Patterns that Pervade

The list of resource sectors that could be covered in a similar fashion is nearly endless, from coal bed methane, shale gas, and mountain-top mining to fisheries, groundwater extraction, and hydroelectric power. We have reviewed a few industries not because (with the exception of energy) they are more important, but simply as illustrations of patterns that are not incidental or isolated but foundational. In short, the state has long been, and continues to be, the biggest developer around. One might even argue that, from the state's perspective,²¹⁰ environmental law is essentially self-regulation, providing environmental protection only to the extent that, like any industry, it does not seriously interfere with its economic priorities. If so, this sheds light on the conundrum facing environmental law today that, despite the best efforts of environmental lawyers over several decades to halt environmentally destructive activities, the environment at all levels and in all parts of the world is spiraling downhill.

This general eco-crisis is now widely understood. It is perhaps most clearly illustrated by a startling set of graphs of the historic trends in resource use and environmental impacts found in Gus Speth's 2008 book, *A Bridge at the Edge of the World*.²¹¹

210. Some will understandably criticize this as a modernist formulation that "reifies" the sovereign state as some fixed identifiable *thing* (the proverbial billiard ball image of a solid core with fixed boundaries), rather than treating it in a more post-structuralist fashion as a fluid, multi-faceted, porous process. From the perspective of green legal theory, however, the concern is to uncover a diverse, but more or less coherent, set of *power logics* that are inherent to this form of governance that follows from its formally constituted character. For an interesting treatment of the state's inherent (bureaucratic and centralist) logic that leads to the simplification of territorial diversity and the homogenization of social structures, see JAMES C. SCOTT, *SEEING LIKE A STATE: HOW CERTAIN SCHEMES TO IMPROVE THE HUMAN CONDITION HAVE FAILED* (1998).

211. JAMES GUSTAVE SPETH, *THE BRIDGE AT THE EDGE OF THE WORLD* xx-xxi (2008). Gus Speth, a former head of the Council of Environmental Quality in

One graph that charts temperature changes is reminiscent of Michael Mann's controversial "hockey stick" graph which showed temperatures rising only slightly over two centuries, then shooting almost straight up over the last few decades.²¹² Climate change deniers vehemently challenged the accuracy of Mann's graph. However, Speth presented not just one graph but sixteen graphs, not just one hockey stick, but a locker room full of them! From water, fertilizer, and paper consumption, to dam construction, motor vehicles use, species extinctions, and loss of tropical rainforest the story is the same: after increasing only slightly over the preceding two centuries, the numbers suddenly shoot up around the middle of the twentieth century. This exponential increase translates, in the United States, to a level of mineral and fossil fuel use over the last half-century that surpasses the amount used by the rest of the world throughout all of human history.²¹³ The conclusion is clear: democratic states have not only failed to stem this tsunami—they have created it.

These trends and what they say about the state of environmental law alarms Mary Wood. The Philip H. Knight Professor of Law at the University of Oregon, Wood begins the abstract for a recent law review paper thus: "Modern environmental law has proved a colossal failure, despite the good intentions and the hard work of many citizens, lawyers, and government officials."²¹⁴ She notes that, in the United States, "[n]early every natural resource—including the atmosphere, water, air, wetlands, wildlife, fisheries, soils, marine systems, grasslands, and forests—is seriously degraded, and many are at the brink of collapse."²¹⁵ She uses sub-headings with titles like

Washington and recent dean of the Yale School of Forestry and Environmental Studies, is one of the leading American environmentalists and environmental lawyers of the modern environmental era. *Faculty Directory: James Gustave Speth*, VT. LAW SCH., http://www.vermontlaw.edu/our_faculty/faculty_directory/james_gustave_speth.htm (last visited Mar. 14, 2013).

212. Michael E. Mann et al., *Global-Scale Temperature Patterns and Climate Forcing Over the Past Six Centuries*, 392 NATURE 779 (1998); see also MICHAEL E. MANN, *THE HOCKEY STICK AND THE CLIMATE WARS: DISPATCHES FROM THE FRONT LINES* (2012) (recalling the controversy triggered by the graph and the science and politics that fueled it).

213. ANDREW DOBSON, *GREEN POLITICAL THOUGHT* 58 (2007).

214. Wood, *supra* note 23, at 43.

215. *Id.* at 44-45.

“ecological bankruptcy” (where she details a dizzying array of statistics of declining fisheries, water quality, forests, and so on), “climate emergency,” “realism,” and “the inevitability of transformational change.” This dire assessment applies directly to the United States, the jurisdiction with the world’s earliest, most sophisticated, and farthest-reaching regulatory regimes.

Professor Wood highlights many of the specific problems in overcoming the conundrum. Environmental law, she argues, is a massive bureaucratic mess with “hundreds of thousands of pages” of statutes that create a “disjointed and complex set of mandates” for agencies whose “accumulated power . . . has stretched the seams of democracy.”²¹⁶ Trying to get a handle on the regulatory complexity and “legal baklava” is impossible, so agencies succumb to political pressure despite the “myth that the agencies operate in good faith.”²¹⁷ The result is that “the public has become disenfranchised” while courts defer to the administrative “discretion” of the agencies even where their decisions may be “infected with political influence and bias.”²¹⁸ The problem is endemic; “something close to an administrative tyranny now presides over Nature.”²¹⁹

These problems with the bureaucratic context of environmental law point to even bigger problems. In his appropriately titled book, *Unnatural Law*, Canadian environmental lawyer, David Boyd, identifies a number of what he calls “systemic weaknesses” in Canada that range from the usual factors (missing laws, excessive regulatory discretion, inadequate implementation and enforcement, low agency budgets) to more political problems such as the influence of industry and labor, bureaucratic inertia, trade restraints, judicial obstacles, and political caution.²²⁰ Boyd’s list of criticisms deepen further, moving from institutional weaknesses to “root causes”

216. *Id.* at 54-55.

217. *Id.* at 57, 59.

218. *Id.* at 59-60.

219. *Id.* at 61.

220. DAVID R. BOYD, *UNNATURAL LAW: RETHINKING CANADIAN ENVIRONMENTAL LAW AND POLICY* 228-72 (2003).

including economic growth, excessive consumption, and population growth.²²¹

In response to the system-wide dysfunction that Wood identifies, she suggests the implementation of a “public trust doctrine” that would see government acting as the people’s designated trustee of natural resources for public benefit rather than private exploitation. Boyd proposes reforms such as a constitutional right of every citizen to a healthy environment.²²² These are certainly useful proposals at the cutting edge of environmental law. Ultimately, however, the question becomes about what is possible through the *legal route itself* insofar as it forces us back inside the box, back inside the same regulatory state that implements it—and that remains embedded in all the problems discussed above.²²³ At stake, says Wood, is the “paradigm of environmental law” itself, and the institutions that embody it.²²⁴

The choice of the word “paradigm” is instructive. Developed by Thomas Kuhn in the 1960s to explain changes in scientific thinking,²²⁵ paradigms were seen to evolve through contradiction and revolution. Whether they be chemists or biologists, doctors or lawyers, Kuhn describes how scientific practitioners work within a set of implicit rules (a paradigm) and way of seeing/experiencing the world (a gestalt) of which they were not fully aware but to which they were firmly attached.²²⁶ They cannot see the paradigm precisely because they are so much a part of it. It defined their world as they did their “normal science,” extending the paradigm by tackling new problems—

221. *Id.* at 273-88.

222. *See also* DAVID BOYD, *THE ENVIRONMENTAL RIGHTS REVOLUTION: LAW, ENVIRONMENT, POLITICS* (2012).

223. For a fuller list of such proposals, see BURNS WESTON & TRACY BACH, *RECALIBRATING THE LAW OF HUMANS WITH THE LAWS OF NATURE: CLIMATE CHANGE, HUMAN RIGHTS AND INTERGENERATIONAL JUSTICE* (2009). It addresses innovative initiatives such as a “law of the ecological commons,” model provisions for state constitutions, model legislation, cap and trade strategies, the sovereign trust, common law reforms, special court-appointed officials, draft UN General Assembly resolutions, proposals to improve the Kyoto Protocol, new WTO rules, and compulsory jurisdiction for the International Court of Justice.

224. Wood, *supra* note 23, at 54.

225. THOMAS KUHN, *THE STRUCTURE OF SCIENTIFIC REVOLUTION* (1962).

226. *Id.*

“puzzle solving.” Then someone confronts an “anomaly” that cannot be resolved within the paradigm. If that person is persistent (and clever) enough, she uncovers the hidden premises on which the paradigm depends, and that no longer work, and she thus sets out to create a new paradigm that does. Not surprisingly, this is not welcome news to the puzzle-solvers, leading to the suppression of the contrary research and the new conversation it inspires, with a new paradigm emerging only through an intellectual and institutional revolution. If ever there were anomalies to a paradigm, Speth, Wood, and Boyd have identified them.

But where is the revolution? Without it, environmental law must ask an allegedly benevolent state to regulate against its own long history of economic expansion and notions of self-interest. It is, thus, an ironic form of self-regulation that, by continuing to place its faith in incremental state regulation, is necessarily held hostage to a pre-regulatory vision of economic growth and political power. Given the trajectory of the planet, it would seem increasingly difficult for the field to avoid a critical engagement with such a limiting context. Perhaps because the field has been so integrated into the instrumental knowledge and practice of the regulatory state, however, its practitioners seem unable to see (and unable to respond to) the problematic in which the field is situated.²²⁷ Environmental law textbooks continue to touch on potentially destabilizing topics like the limits to growth, or global and local inequity, but quickly bracket them as side issues while they get on with the pragmatics of legal practice.²²⁸

227. Instrumental knowledge, as opposed to critical knowledge, is oriented to the means rather than the preset ends and does not question the larger context within which knowledge is developed. As such, it serves an unquestioned value system, in this case, an economic system that prioritizes maximization of production and consumption and a regulatory system that facilitates it.

228. A common pattern can be observed in leading American environmental law text books: a brief introduction of five to ten pages of “perspectives” on environmental law is followed by 1,000 pages of intra-systemic practice. *See, e.g.*, HOLLY DOREMUS ET AL., *ENVIRONMENTAL POLICY LAW: PROBLEMS, CASES, READINGS* (2008); ROBERT V. PERCIVAL ET AL., *ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY* (2006); RICHARD L. REVESZ, *ENVIRONMENTAL LAW AND POLICY: PROBLEMS, CASES AND READINGS* (2008); and NICHOLAS A. ASHFORD & CHARLES C. CALDART, *ENVIRONMENTAL LAW, POLICY AND ECONOMICS: RECLAIMING THE ENVIRONMENTAL AGENDA* (2008). Similarly, Richard Lazarus cites many

Nowhere is this legal field explicitly situated within any critical, let alone systematic, understanding of how diverse underlying economic and political forces have created this environmental problematic, or, to put this in GLT language, how their *de facto* regulatory “logics” have developed “system dynamics” that mandate it. Thus, GLT seeks to re-orient the attention now directed to *downstream* “legal laws” to develop a new understanding of the *upstream* constitutive “dynamics” of material and cultural production that today lie largely undisturbed behind the environmental law paradigm. Those few incipient green legal scholars who have looked at this situation confront a common challenge: that we must transcend the liberal paradigm that bounds environmental law.²²⁹

V. LIBERALISM AND THE LAW OF MITIGATED PRODUCTION

A. Reconciling the Two Faces of Liberalism

Although the character of liberalism has evolved through various forms over the centuries,²³⁰ one can identify a common

problems with environmental law that could be deemed to be systemic in nature, but he concludes that a revolutionary reworking of environmental law is not needed, keeping the basic architecture as the basic mix of laws and institutions is adjusted. Lazarus, *supra* note 25, at 225-26. Michael Kraft also sees market mechanisms and command-and-control regulation as maintaining their dominance in environmental law well into the future. KRAFT, *supra* note 27, at 139. Finally, Keith Hirokawa, though he recognizes the existence of “radical” critiques of environmental law, prefers to “find better environmental solutions that both effect a change in the way we treat the environment and are practical enough to be adopted by our legal system.” Keith Hirokawa, *Some Pragmatic Observations About Radical Critique in Environmental Law*, 21 STAN. ENVTL. L.J. 225, 281 (2002).

229. See, e.g., CAHN, *supra* note 59; GEOFFREY LEANE, *Environmental Law’s Liberal Roots: (Not) a Green Paradigm* in GREEN PARADIGMS AND THE LAW 1 (Nicole Rogers ed., 1998); Cynthia Giagnocavo & Harvey Goldstein, *Legal Reform or World Re-form: The Problem of Environmental Rights*, 35 MCGILL L.J. 345 (1990); and R. Michael McGonigle & Paula Ramsay, *Greening Environmental Law: From Sectoral Reform to Systemic Reformation*, 14 J. ENVTL. L. & PRAC. 342 (2004).

230. These include classical liberalism of the eighteenth and nineteenth centuries that led to the liberal democracy of the nineteenth and twentieth century, and developed into the liberal welfare state from the 1920s and the

set of cultural assumptions and values that have taken root in Western industrial society and helped to propel its economic and political successes. This philosophical liberalism has also facilitated its environmentally destructive behavior²³¹ while informing and constraining environmental law and democratic processes more generally. Although it is difficult to summarize the tenets of liberalism in a way that does full justice to its evolving character, nevertheless we will consider it briefly to see why a philosophical re-constitution is necessary for a green reformation.

The foundational concept of liberalism is that of the autonomous (rational, self-determining) individual. It is argued that when individuals are free to pursue their own vision of the good life and to maximize their own personal “utility,” that pursuit can also benefit society generally.²³² This is certainly the premise of a social reliance on self-directed interactions through the marketplace, a marketplace that puts rationality, individualism, and free competition at the center of social life.²³³ In turn, the state is limited, refraining from intruding upon these individual strivings except in carefully constrained ways. One acceptable intrusion is to put in place those conditions that can

neoliberalism of the 1980s. See, e.g., C.B. MACPHERSON, *THE LIFE AND TIMES OF LIBERAL DEMOCRACY* (1977); DAVID HELD, *MODELS OF DEMOCRACY* (2006). For a recent critique of the contradictions (or as he puts it, the hypocrisy) of liberalism, see DOMENICO LOSURDO, *LIBERALISM: A COUNTER-HISTORY* (2011).

231. See, e.g., Margaret FitzSimmons et al., *Environmentalism and the Liberal State*, in *IS CAPITALISM SUSTAINABLE?* (Martin O'Connor ed., 1994); ROBYN ECKERSELY, *THE GREEN STATE: RETHINKING DEMOCRACY AND SOVEREIGNTY* (2004); Val Plumwood, *Has Democracy Failed Ecology?*, in *ECOLOGY AND DEMOCRACY* (Freya Mathews ed., 1996); and VAL PLUMWOOD, *ENVIRONMENTAL CULTURE: THE ECOLOGICAL CRISIS OF REASON* (2002).

232. See LEANE, *supra* note 229, at 6-7; CAHN, *supra* note 59, at 4-5.

233. The concept of bounded rationality, however, points out that full rationality is limited by both cognitive and emotional boundaries. Not only are human cognitive capabilities quite limited, particularly in our globalized system of production and consumption, emotional impulses may override conclusions drawn from rational deliberations. See Richard Selten, *What is Bounded Rationality?*, in *BOUNDED RATIONALITY - THE ADAPTIVE TOOLBOX* 13-36 (Gerd Gigerenzer & Reinhard Selten eds., 2002). On the process by which the market moved from the periphery to the center of social ordering, see KARL POLANYI, *THE GREAT TRANSFORMATION* (1944). Polanyi draws attention in this work to the destructive effects of this historical move, including its implications for state action.

facilitate the individuals' ability to pursue their self-interest including, first and foremost, state enforcement of private property and contractual relations through both civil and criminal laws. Similarly, an economic role for the state (its "social welfare" function) is justified if it can help remedy situations where the pursuit of such self-interest leads to distortions in the market. For example, when "externalities" (such as climate change) are left out of the market equation, state intervention is useful to help "internalize" these omissions so that the resulting market values reflect their full costs and benefits. At a political level, state legitimacy is derived as well from enhancing the individual's freedom to choose the government such individuals collectively desire, including related rights such as the freedom of speech, freedom of association, the rule of law, freedom to participate in the political process, and so on. Citizens, through their participation, consent to be governed by those who have been properly elected. Here, however, a clear tension exists between the pursuit of liberalism in its economic form (driven by the pursuit of individual self-interest) and in its state democratic form (motivated to maintain the equality of each citizen).

Liberal democracy can, therefore, be separated into its economic and political aspects. By examining the tension between economic and democratic liberalisms, we can uncover the constraints imposed upon the state that attempts to respond to the ecological crisis. Since much of the pursuit of self-interest is of an economic nature, free individuals make personal consumption choices based on their personal values and desires, while producers compete to meet those consumption demands.²³⁴ Decisions are taken on the basis of their existing economic endowments. These are also the central elements of the *capitalist* market economy which, as Matthew Cahn points out, share the same central values of "private property, competitive self-interest, economic liberty, and minimal government."²³⁵ The

234. See LEANE, *supra* note 229, at 7.

235. CAHN, *supra* note 59, at 11. As David Held points out, "while different variants of liberalism interpreted [freedom of choice] in different ways they were all united around the advocacy of a constitutional state, private property and the competitive market economy." HELD, *supra* note 230, at 59.

resulting system is characterized by allocative efficiency (as a result of well functioning markets), wealth maximization, and growth, all of which take on the appearance of value-neutrality insofar as they build on the foundational (indeed, “naturalist”) reference point of the rational individual.²³⁶ If all functions as it should, the result, is economic equilibrium, social welfare, and democratic stability.²³⁷

In a free and competitive market economy, capital demands a *return*, whether in interest payments or returns on investment. Thus, under capitalism, growth has a life of its own; it is inherent to it. That is what capital does automatically, and must do, if it is to perform its essential function. To any mainstream economist, this is an obvious and uncontroversial truth.²³⁸ An individual producer enhances his returns to capital by investing his revenues in innovation and technologies that will generate cost-saving efficiencies. If other owners of capital are doing likewise, anyone who does not keep up with these improvements will see their capital diminish in relative value. Under competitive conditions, all producers continuously seek to reduce their costs so that they might retain their market share against other

236. See LEANE, *supra* note 229, at 7. This naturalism can be seen, for example, in the famous Lockean assertion that there is “a law of nature to govern it, which obliges every one: and reason, which is that law, teaches all mankind, who will but consult it, that being all equal and independent, no one ought to harm another in his Life, Health, Liberty or Possessions.” John Locke, *An Essay Concerning the True Original Extent and End of Civil Government*, in TWO TREATISES OF GOVERNMENT 271 (1690/1988). Through this move, what is today seen as the “positivist” character of liberal theory (founded in individualism, reason, property) is ultimately situated within a “naturalist” truth claim. In opening up today’s positivist ideology to critical re-examination, a core task is to re-engage with this long (but falsely) rejected tradition of philosophical naturalism (and natural law). Addressing this controversial and difficult topic is beyond the scope of this paper except to note that it leads ineluctably to a re-examination of such institutions as capitalism and the modern state as assumed (“naturalized”) forms of social organization.

237. See CAHN, *supra* note 59, at 11.

238. See Richard Smith, *Beyond Growth or Beyond Capitalism*, 53 REAL WORLD ECON. REV. 28, 31 (2010). The article highlights the rejection by Tom Clougherty, executive director of the right-wing think tank, the Adam Smith Institute, of the concept of a no-growth capitalism. Commenting on a proposal for a Steady State Economy by the New Economics Foundation, Clougherty asserts that it shows “a complete lack of understanding of economics.” *Id.* at 28.

producers who are doing the same thing.²³⁹ This competition tends to drive down prices for everyone (to the benefit of consumers). In response, if all producers can expand the size of the market as a whole (i.e. its overall growth), this will allow them all to benefit by bringing in new consumers who can take up the increased flow of products that result from these economies of scale. In such a situation, more producers can survive the pressures of competition.

This production treadmill of growth points, as we have seen, to higher level, systemic dynamics that function as a culturally constitutive mode of regulation. Maintaining such growth is a core mandate of those business corporations with shareholders who invest with the sole intention of maximizing returns on their investment. Indeed, this mandate is legally enshrined in a business corporation act.²⁴⁰ With growing new markets a key safety valve for capital, economic colonization is another “dynamic” of capitalism, as is the corollary drive to break down legal barriers to liberal economic freedom so that competitors can more easily access new pools of cheaper labor and more consumers throughout the world. This is why the recent bout of economic globalization is also termed “neo-liberalism” insofar as it repeals state controls in favor of (corporate) economic freedoms. These material processes also have *culturally constitutive* effects insofar as ordinary individuals in capitalist economies have invested their savings (their capital) in pension funds and investment portfolios with the insistent expectation that their investment will grow, increase their wealth, and carry them through their lives.

As a neutral ideology rooted in the rational individual, economic liberalism takes existing individual endowments as given, regardless of how unequally wealth is distributed. In the early years of industrialism, only a minority of the state’s population owned the capital that produced goods so that great

239. Marx discussed this process in light of how it translated into a “tendency of the rate of profit to fall.” KARL MARX, CAPITAL VOLUME 3: THE PROCESS OF CAPITALIST PRODUCTION AS A WHOLE (1967/1894).

240. See Smith, *supra* note 238, at 34, 31; see generally FRED MADOFF & JOHN BELLAMY FOSTER, WHAT EVERY ENVIRONMENTALIST NEEDS TO KNOW ABOUT CAPITALISM (2011).

inequality existed between such owners and those who had to sell their labor for wages. This historical mal-distribution of income, wealth, and power again reflects the difference between economic liberalism (where individual *inequality* is inherent) and liberalism in democracy (with its formal equality of each voting citizen). The potential for political discord arises if economic differences become too great as we have recently seen with the Occupy movement.²⁴¹ Again, economic growth plays an essential political role here by helping to mitigate the effects of economic inequality not by *redistributing* social wealth (that is, by slicing the existing economic pie differently) but by *expanding* it overall (so that more benefits accrue to everyone from a larger pie). As the neoliberals mantra goes, free trade is good because “a rising tide lifts all boats.”²⁴²

The state also has a role to play in addressing problems of inequity, for example, through imposing progressive taxes on income and providing social services for all, but this function is limited. As it is commonly expressed, the redistribution of income (e.g. differential tax rates) is liberal; the redistribution of wealth (e.g. nationalization) is radical. The flip side of the liberal response is, however, that a significant re-distribution of wealth (and not just of income) would be a pre-requisite for the state that hopes to escape its dependence on continuous economic growth with all its damaging environmental effects. As it is, a static or shrinking national economy effectively determines the nature of state action—stimulus—because, in the absence of radical economic equity, all modern democracies must pursue growth as the basis upon which its political aspirations for social welfare can be met. In short, the inherent growth dynamic of capitalism is foundational to contemporary economic, political, and social life such that *regulatory economic* actions are subsidiary to (deeper) *constitutive ecological* ones.²⁴³

241. See *About, OCCUPYWALLSTREET*, <http://occupywallst.org/about/> (last visited Mar. 11, 2013).

242. DAVID HARVEY, A BRIEF HISTORY OF NEOLIBERALISM 64 (2007).

243. In this light, advocacy for new forms of the “commons” or for “co-operative” new forms of economic organization should be appreciated not just as another set of “legal reforms” for social justice, but as potentially foundational “constitutive re-formations” because they address the underlying logics of dominating systems, the underlying system dynamics. This shift in “legal”

It is not surprising, therefore, that a primary function of the modern state (especially from the advent of industrial capitalism in the 18th century) has been to provide the conditions for capitalist growth—enforcing contracts, protecting property rights, providing public infrastructure and public administration, backing colonial projects internally and externally to the state, and so on.²⁴⁴ These functions today are even more diverse, from ensuring access to a well-qualified labor force, to supporting improvements in technology, or subsidizing resource-extracting activities. But the liberal *democratic* state has to be responsive not only to the demands of capital but also to those who are exploited, marginalized, or in some other way harmed by the inequalities embedded in the economic system. To do this, the state relies on tax revenues (themselves a product of the growth economy) to fund programs and policies such as social security, health care, or public education that can address social and economic ills. A growing economy allows for more social spending with lower taxes and leads to high public approval. As a result, democratic state “legitimacy” is dependent on maintaining a high level of economic growth. A capitalist economy without growth leads not only to an economic but a political downturn. Consequently, the promotion of economic growth, as Gus Speth noted, “may be the most widely shared and robust cause in the world today.”²⁴⁵

understanding entails as well, of course, the embrace of a new set of knowledges, discourses, processes, alliances, and strategies that reaches beyond existing environmental legal concerns.

244. In England, for example, *internal* state colonialism was especially important in the thousands of “acts of enclosure” that were promulgated by the English Parliament to allow for the privatization of communal lands to facilitate the wool trade, while *external* state colonialism involved the assertion of Crown title over foreign lands (the basis of the early development of the United States) in order to gain access to new resources and lands. Interestingly, the colonial expedition encountered forms of indigenous governance that were so unlike the European state that they were not recognized and their lands were conveniently treated as “empty” (*terra nullius*). Again, these colonial processes can be understood as driven not by some ad hoc political choices but by the constitutive dynamics by which the dominating systems of social organization inherently operate.

245. SPETH, *supra* note 211, at 47. Or, as historian J. R. McNeil argued, “the overarching priority of economic growth was easily the most important idea of

To the environmentalist, of course, problems arise with the physical consequences of such growth. In an open (frontier) landscape, such problems can be tolerated; in a closed (full) world, they cannot. Clearly, an economy cannot continue to expand indefinitely in a bounded environment without profound repercussions. Indeed, signs that we have reached the limits of growth are mounting all around us, from collapsed fisheries and massive forest loss to ocean dead zones and climate change. Nevertheless, the ideology of growth is so entrenched (as a constitutive mandate) and so functionally important that to speak of the limits of growth is still economic heresy and political suicide.²⁴⁶ In this situation, the state inevitably has a double role: promoting economic growth and accumulation on the one hand, while it cleans up the resulting environmental problems on the other. But if a state were to dramatically seek to reduce or eliminate environmentally destructive economic activity, it would risk setting off multiple crises from job loss and business shutdowns to capital flight. Thus, no liberal democratic state has been willing to advance environmental protection to such an extent that it risks economic growth. As Eckersley writes, “the boundaries of successful policies are invariably set by the buoyancy of the economy.”²⁴⁷

In today’s shrinking world, the massive size of the global economy and its inequitable character pose unique challenges for state management framed by this conundrum. On the one hand, we cannot do without growth. On the other hand, if the liberal democratic state fails to respond to the environmental concerns of its citizens, it also risks losing legitimacy. This tension between the “liberal” goal of promoting capital *accumulation* and the “democratic” need to maintain *legitimacy* is the fundamental

the twentieth century.” J.R. McNEIL, SOMETHING NEW UNDER THE SUN 336 (2000).

246. For a recent discussion of how this imperative has even undermined the critical field of ecological economics that was intended to challenge the growth commitment, see Blake Anderson & R. Michael McGonigle, *Does Ecological Economics Have a Future? Discourse and Contradiction in the Age of Climate Change*, 84 ECOLOGICAL ECON. 37 (2012).

247. ECKERSLEY, *supra* note 231, at 55. This fact is obvious in the minimal progress made at recent rounds of international climate talks despite widespread acknowledgement of the urgent need to address climate change.

contradiction embedded in “liberal democracy.”²⁴⁸ To date, the answer has been, argues Colin Hay, for the state to “respond at a largely tactical or a cosmetic level,” that is, to “respond to *subjective perceptions of crisis rather than to the contradictions and discontinuities that precipitate such threats to legitimacy*.”²⁴⁹ This is the connection that Matthew Cahn also makes between tactical or “symbolic” politics and environmental law.²⁵⁰ In a manner similar to our discussion above of various regulatory fields, Cahn demonstrates how environmental regulations from the Clean Air Act, Clean Water Act, and several acts addressing solid and hazardous waste have been designed to “satisfy public anxiety while maintaining a commitment to traditional liberal economic development.”²⁵¹ Consequently, governments encourage (and subsidize) technological developments that make deep-water drilling safer and cars more fuel efficient; develop complex regulatory schemes that mandate scrubbers on new thermal plants and phased-in retrofits on old ones; and subsidize “green” windmills—always seeking to balance accumulation with legitimation through a regulatory infrastructure “in which people are eager for reassurance that they are being protected and therefore eager to believe that publicized government actions have the effects they are suppose to have.”²⁵²

That we can in fact square the circle of healthy economic growth with healthy environmental stability is the underlying faith of environmental law and its active mission. The goal is not to challenge the liberal economic order, but to make it work in harmony with the environment. In other words, environmental law works as a kind of *law of mitigated production*, the primary

248. For a critical analysis of this core dynamic of ensuring “accumulation” while maintaining the nexessary “legitimation,” see Margaret FitzSimmons et al., *Environmentalism and the Liberal State*, in IS CAPITALISM SUSTAINABLE? 198 (Martin O’Connor ed., 1994); Colin Hay, *Environmental Security and State Legitimacy*, in IS CAPITALISM SUSTAINABLE? 217 (Martin O’Connor ed., 1994); JURGEN HABERMAS, LEGITIMATION CRISIS (1973); JAMES O’CONNOR, THE FISCAL CRISIS OF THE STATE (1973).

249. Hay, *supra* note 248, at 221. The environmental crisis is therefore addressed as “a particular and transient political rationality as opposed to a crisis of capitalist accumulation per se.” *Id.*

250. See CAHN, *supra* note 59, at 18-28.

251. *Id.* at 28.

252. *Id.* at 19.

goal of which is to improve existing processes and structures of production but without fundamentally challenging the context in which they operate. This was the legal ideology driving President Obama as he confronted the BP blowout in the Gulf of Mexico. But it infuses virtually every environmental and resource management regime on the books, and it does so everywhere in the industrialized world.

B. Mitigating Production Through Efficiency

In the 1980s, the ambition to square this circle was given a name, “sustainable development.” Its message was simple: in a world divided between developed economies (with strong environmental standards and quality environments) and underdeveloped economies (with neither), economic growth was the pathway to both development and environmental quality. In the 1990s, this formulation was refined through the terminology of “ecological modernization” that saw sustainable development being achieved even for Western countries by engaging in environmentally-beneficial growth through enhanced resource *efficiencies*—doing more with less—so that the negative consequences of growth would not arise in the first place. Within this large-scale project of social engineering, environmental law has played an essential, supportive role in its constant quest to internalize externalities through the market.

This managerial model builds on well-established economic principles of a free, competitive market system that is designed to produce outcomes that will be “Pareto optimal.”²⁵³ This means that the system “inevitably allocates resources, distributes income and apportions consumer goods among consumers so that no reallocation of resources through changes in consumption, exchange, or production could *unambiguously* augment the value of the commodities being produced and exchanged.”²⁵⁴ This

253. See E.K. HUNT, HISTORY OF ECONOMIC THOUGHT 473 (1992).

254. *Id.* at 476. This is based on a number of assumptions including a large number of buyers and sellers, no uncertainty about the future, perfect knowledge, and markets that are always in equilibrium. Once a Pareto optimal situation is achieved, the position of one individual cannot be improved without harming or worsening the position of another. This situation takes the existing distribution of wealth, income, power “as given,” just as it does the

result of “allocative efficiency” can be achieved only if the correct price signals are sent to the market. But negative social and environmental “externalities” such as pollution or illnesses distort prices. Welfare economics does not, however, see externalities as arising *from economic growth per se* but as a result of specific instances of (correctable) “market failures.” From this understanding, environmental “goods” are abused because they are free, a situation that could be corrected if they were (properly) priced and paid for. To restore the system to a state of Pareto optimality, the government intervenes as an impartial arbitrator to enact a tax or provide a subsidy such that the unpriced externality is neutralized. Hence, “the solution to any problem faced—from global warming and biodiversity loss to terms of trade and income distribution—is a secondary outcome of ‘getting the prices right.’”²⁵⁵ This understanding of “market failure” provided the intellectual justification and procedural tools for the wave of environmental regulations that took hold in the 1970s and even more so in the 1980s and 90s. It still drives thinking today.²⁵⁶

This principle of allocative efficiency underlies the field of law and economics which eschews substantive (political) concerns of distributive justice or environmental health as well as the larger concerns about growth that follow from a critical political

accompanying legal system, moral values, and institutions for granted. *See id.* at 478-80.

255. John Gowdy & Jon D. Erickson, *The Approach of Ecological Economics*, 29 CAMBRIDGE J. ECON. 207, 209 (2005).

256. This underlies the burgeoning field of pricing “ecosystem services,” a movement that is (ironically) being driven by ecological economists who question growth but not the mainstream economic tools (i.e. prices) of the capitalism that demands such growth. For more general discussions of the nature and promise of the economic methodology of ecosystem services pricing, see James Boyd & Spencer Bazhaf, *What are Ecosystem Services? The Need for Standardized Environmental Accounting Units*, 63 ECOLOGICAL ECON. 616 (2007); Robert Constanza et al., *The Value of the World’s Ecosystem Services and Natural Capital*, 387 NATURE 253 (1997); and Rudolf DeGroot, *A Typology for the Classification, Description and Valuation of Ecosystem Functions, Goods and Services*, 41 ECOLOGICAL ECON. 393 (2002). For a recent discussion of this thinking as it relates to the failure to achieve international targets for biodiversity conservation, see Charles Perrings et al., *Ecosystem Services, Targets, and Indicators for the Conservation and Sustainable Use of Biodiversity*, 9 FRONTIERS ECOLOGY ENV’T. 512 (2011).

economy. Instead, this school focuses on procedural processes and “objective” calculations of the efficient allocation of resources.²⁵⁷ For example, in situations where the market breaks down (where, for example, a new form of nuisance arises from a novel technology), the state may be required to assign legal rights to one party. Such assignments, law and economics scholars pointed out, will allow the state to affect ab initio the efficiency of resource allocation and so require a guiding principle to neutralize the potential redistributive effects of that initial allocation. Richard Posner, one of the field’s central scholars, proposed that legal authorities should assign property rights to those parties who would have secured them through market exchange.²⁵⁸ By doing so, law would be able to promote efficiency by “mimicking the market”²⁵⁹ and thus avoid tricky questions of the distribution of wealth and power.

This championing of market forces is not merely some right-wing conspiracy to avoid the big questions; its logic is pervasive within market society. At the risk of repetition, this logic is, from a GLT perspective, presently ignored as having a constitutive (i.e. regulatory) effect that operates beyond the “legal law.” The embrace of this regulatory logic led to the adoption of Anthony Giddens’ “Third Way” by both the liberal Clinton administration in the U.S. and the Blair Labor government in the U.K.²⁶⁰ in their attempts to achieve both the social goals of liberal democracy and the efficiency goals of liberal economics without the distortions that accompany direct state management or control.²⁶¹ As Giddens succinctly put it: “Securing greater social justice depends upon a robust economy, not the other way around.”²⁶² This, he argued, was because “a competitive economy

257. See Jules Coleman, *Economics and the Law: A Critical Review of the Foundations of the Economic Approach to Law*, 94 *ETHICS* 649 (1984).

258. *Id.* at 662.

259. *Id.*

260. See ANTHONY GIDDENS, *THE THIRD WAY: THE RENEWAL OF SOCIAL DEMOCRACY* (1998).

261. See Anthony Giddens, *It’s Time to Give the Third Way a Second Chance*, *THE INDEPENDENT* (June 28, 2007), <http://www.politicsforum.org/forum/viewtopic.php?f=28&t=79097>.

262. *Id.* He points out, moreover, that all successful left-of-center leaders are moving toward the political center. One can appreciate the ideology in this

is the necessary condition of job creation and the goal of sustaining full employment.”²⁶³ Unlike the more combative focus of progressive politics on material inequalities and the redistribution of wealth, the Third Way presented the structuring imperatives of capitalism and economic globalization as self-evident, neutral, and even inevitable. Social problems are to be resolved within the existing social order through improved economic efficiencies that utilize market forces.²⁶⁴

Despite the catastrophic recession of 2008-2009, itself arguably the product of the failure of neoliberalism, the market/managerial lineage continues as strongly as ever, the zeitgeist of the still dominant neo-liberal age. Following along are the new, policy-relevant environmentalists who have embraced the paradigm of ecological modernization to resolve what might be seen as structural problems not with structural solutions, but with internal reform technologies based on economic efficiency and market forces.

C. Neoliberal Environmentalism

Accompanying the wave of neoliberalism (and de-regulation) that swept through Western governments (and international agencies) in the 1980s and 90s, ecological modernization became *the* strategy for dealing with environmental problems but not through after-the-fact regulatory interventions but in advance of their even arising by reshaping economic growth itself. It revolved around the idea that the state can “enhance the competitiveness of industry by unilaterally *increasing* rather than decreasing the stringency of environmental regulation.”²⁶⁵ The basic philosophy is summed up by the motto “pollution prevention pays.” Ecological modernizers argue that “under the

statement by inverting it as follows: “Securing a just society is the prerequisite for a robust social economy.”

263. ANTHONY GIDDENS, *WHERE NOW FOR NEW LABOUR?* 78-79 (2002). This evidently ignores the structural or sociological barriers that place actors at different levels of power and advantage.

264. See Shane Fudge & Stephen Williams, *Beyond Left and Right: Can the Third Way Deliver a Reinvented Social Democracy?* 32 *CRITICAL SOC.* 583 (2006).

265. ECKERSLEY, *supra* note 231, at 69.

proper political, economic, and technological conditions, competition among capitalists can be redirected so as to achieve pollution-prevention eco-efficiencies within the spheres of production and, ultimately, consumption.”²⁶⁶ From this understanding, not only are industrialization, technological development, and economic growth compatible with environmental values, they are the “key drivers of environmental reform.”²⁶⁷ Consequently, rather than constraining the economy, environmental regulations differently designed and oriented are seen to maintain and even enhance economic growth while simultaneously improving the environment.²⁶⁸ By allowing businesses more flexibility to internalize real environmental costs, “[m]ore production and consumption in economic terms (GNP, purchase power, employment) do not have to imply more environmental devastation (pollution, energy use, loss of biodiversity).”²⁶⁹

A range of approaches exist within ecological modernization from the technocratic, cost minimization strategies of “weak” ecological modernization to the more critical and potentially transformative understandings of “strong” ecological modernization.²⁷⁰ Originally, ecological modernization was

266. Michael Carolan, *Ecological Modernization Theory: What About Consumption?* 17 SOC’Y & NAT. RESOURCES 247, 250 (2004). This is in the same spirit as the influential 1987 report, “Our Common Future,” considered to be one of the paradigm statements of ecological modernization (but with far less of the modernizer’s focus on technological innovation and efficiency). See WORLD COMM’N ON ENV’T & DEV., OUR COMMON FUTURE (1987); see also MAARTEN HAJER, THE POLITICS OF ENVIRONMENTAL DISCOURSE: ECOLOGICAL MODERNIZATION AND THE POLICY PROCESS 26 (1995); Arthur Mol & Gert Spaargaren, *Ecological Modernization Theory in Debate: A Review*, 9 ENVTL. POL. 17, 23 (2000) (presenting a more nuanced position on an ecological modernization focused on “redirecting and transforming ‘free market capitalism’ in such a way that it less and less obstructs, and increasingly contributes to the preservation of society’s sustenance base in a fundamental/structural way.”).

267. Richard York & Eugene Rosa, *Key Challenges to Ecological Modernization Theory*, 16 ORG. & ENV’T 273, 274 (2002).

268. See Albert Weale, *Politics of Ecological Modernization*, in DEBATING THE EARTH: THE ENVIRONMENTAL POLITICS READER 237-249 (John Dryzek & David Schlosberg eds., 1998).

269. Mol & Spaargaren, *supra* note 266, at 36.

270. See Peter Christoff, *Ecological Modernization, Ecological Modernities*, 5 ENVTL. POL. 476 (1996); see generally Mol & Spaargaren, *supra* note 266; and HAJER, *supra* note 266.

conceived as an approach to operationalizing the controversial precautionary principle that also emerged in the late 1980s. This principle emphasizes the need to avoid damages to the natural world even where there is no conclusive scientific understanding of the threat posed by a new technology, industrial emission, or production practice.²⁷¹ Weak versions of ecological modernization focus on the role of technology and the market to help reach existing industrial objectives and new environmental goals through production that is technologically “smart” and economically hyper-efficient, achieving “clean production” through “closed-loop” technologies. In contrast to this reformist industrial model, the “strong” version critically reflects on the industrial goals themselves, seeking to shift from a technocratic model of efficiency-oriented management to a more interventionist model of wholesale industrial redesign.²⁷² Such a shift would be attained not only through technological and cost-effective economic innovation, but through new forms of environmental governance and institutional reflexivity.²⁷³

Not surprisingly, the stronger conception has not taken hold. Instead, as two scholars trenchantly argued, the popular rhetoric and practice of ecological modernization has tended toward “a joyful fairy tale of low-hanging £10 notes and . . . an undue preoccupation with company innovations only at the margin of traditional production practices.”²⁷⁴ Weak ecological modernization thus infuses corporate strategies of eco-efficiency and green consumerism (e.g. electric cars) but it does so by eschewing more dramatic approaches that would lead to wholesale industrial rethinking that might entail significantly reduced levels of consumption and growth (e.g. displacing private

271. See Mikael Skou Anderson & Ilmo Massa, *Ecological Modernization – Origins, Dilemmas and Future Directions*, 2 J. ENVTL. POL’Y & PLAN. 337, 338 (2000).

272. For an interesting discussion of the science behind current environmental policy versus an alternative precautionary science more consistent with the precautionary principle, see Katherine Barrett & Carolyn Raffensperger, *Precautionary Science*, in PROTECTING PUBLIC HEALTH AND THE ENVIRONMENT – IMPLEMENTING THE PRECAUTIONARY PRINCIPLE 106 (Carolyn Raffensperger & Joel Tickner eds., 1999).

273. See ECKERSLEY, *supra* note 247, at 71.

274. See Anderson & Massa, *supra* note 271, at 338.

cars within designated urban boundaries).²⁷⁵ The difference is manifest, for example, in the embrace of enhanced *risk management* as opposed to systemic *risk reduction* (especially where the latter is undertaken for larger socio-economic goals that cannot be justified in advance as being “cost effective”). The dominant approach matches with the common objective of ecological modernization to “reconcile the tensions between technology and ecology, economic growth and ecology, and competitive market and ecology.”²⁷⁶ Achieving such a reconciliation draws on two complementary approaches: technological innovation from within business and the use of market-based instruments within governments to internalize environmental costs.²⁷⁷

One of the best known books to espouse the benefits of eco-efficiency is Paul Hawken, Amory Lovins, and Hunter Lovins’ *Natural Capitalism* (1999). The book’s central premise is the need for a resource productivity revolution that could be brought about through radical changes in design and technology.²⁷⁸ The authors note the important outcomes that can be achieved by taxing, rather than subsidizing, environmentally destructive activities. They also point out that restructuring in some sectors is “gaining its momentum not from regulatory mandates, taxes or subsidies but rather from newly unleashed forces of advanced technology, customer demands, competition and entrepreneurship.”²⁷⁹ They point to a supposed transformation in the car industry (touting its development of the super-light and fuel-efficient “hypercar”), proclaiming that “if this industry can

275. See Nicholas Ashford, *Government and Environmental Innovation in Europe and North America*, 45 AM. BEHAVIORAL SCIENTIST 1417, 1417-18 (2002); and David Schlosberg & Sara Rinfret, *Ecological Modernization, American Style*, 17 ENVTL. POL. 254 (2008).

276. Valerie Fournier, *Escaping from the Economy: The Politics of Degrowth*, 28 INT. J. SOC. & SOC. POL’Y 528, 530 (2008); see also I. Blüdhorn & I. Welsh, *Eco-Politics Beyond the Paradigm of Sustainability: A Conceptual Framework and Research Agenda*, 16 ENVTL. POL. 185 (2007).

277. At the risk of repetition, GLT inverts this approach by addressing the inherent dynamics of the economic systems underlying these regulatory strategies.

278. PAUL HAWKEN ET AL., *NATURAL CAPITALISM* (2d ed. 2010).

279. *Id.* at 22.

fundamentally change, every industry can.”²⁸⁰ Dow Chemical is held up as a model for energy efficiency, reaching a savings of \$9 billion in energy costs through a \$1 billion investment in efficient energy use.²⁸¹ “Protecting the climate is not costly but profitable,” they assert, “because saving energy costs less than buying it.”²⁸²

This movement has hit its stride in recent years in response to the climate crisis where government “command and control” regulation has been limited, but economic innovations in the law have been plentiful. A variety of pricing mechanisms are seen as capable of reducing the generation of carbon-based externalities. One is the carbon tax that places an escalating charge on the use of carbon-based fuels such as gasoline. As the charge increases over time, say from an initial 5 cents/gallon to 20 or 30 cents/gallon or more, producers will be encouraged to improve fuel efficiency or to switch to hybrid electric motors. Another is the cap-and-trade system that sets a cap on the maximum amount of carbon that might be emitted by an industry, say steel manufacturing, and then allows steel manufacturers to trade an allocated set of carbon credits amongst themselves so that the firm that is best placed to improve its efficiency in a cost-effective fashion does so, partly financed by selling its credits to other firms that cannot make those changes as easily. By continually reducing the size of the cap over time, new improvements will always be needed, the continuing pressure continuously driving up the value of the credits, thus keeping the momentum going.²⁸³

280. *Id.* at 23. As arch-critic of Hawken and the Lovins, Vaclav Smil points out the hypercar has yet to materialize. VACLAV SMIL, *ENERGY MYTHS AND REALITIES: BRINGING SCIENCE TO THE ENERGY POLICY DEBATE* 48 (2010). For his devastating contemporary review of Natural Capitalism, see Vaclav Smil, *Rocky Mountain Visions: A Review Essay*, 26 *POPULATION & DEV. REV.* 163 (2000).

281. *Id.* at xiii. *But see* PESTICIDE ACTION NETWORK, *DOW CORPORATE PROFILE* (2000), available at <http://www.panna.org/resources/corporate-accountability/profiles/dow> (last visited May 22, 2012). Dow Chemical is more likely to be associated with the hazardous chemicals it produces (including agent orange and DDT) rather than environmental stewardship. Dow and its subsidiary, Union Carbide, have been named by the EPA as responsible parties for 136 hazardous waste sites. *Id.*

282. HAWKEN ET AL., *supra* note 278, at xiii.

283. Emissions trading is also recommended as a cost-effective option for other air pollutants such as sulphur dioxide and nitrogen oxides. *See* SUSTAINABLE

Following this logic even further is the use of carbon offsets that allow individuals and companies that cannot *reduce* their carbon emissions directly (because of costs) instead to contribute to others who promise to *absorb* them in other ways and places (where it is cheaper to do so).²⁸⁴ For example, the Costa Rican national government in the 1990s paid landowners to preserve forested land or to reforest degraded land. The government then sold this “carbon storage capacity” to volunteer markets. It later established Certified Tradable Offsets to expand the sale of carbon sinks from its forests.²⁸⁵ The primary role of the state is, thus, to “create markets rather than replace them,”²⁸⁶ the expected result of these market mechanisms being an explosion of innovation that reduces greenhouse gases but also improves economic efficiency and economic growth.²⁸⁷

This approach is embodied in the work of a sophisticated new Canadian environmental organization, Sustainable Prosperity.²⁸⁸ Pricing carbon, they contend, “is the most effective and efficient measure for reducing [the] carbon emissions” in addition to providing many indirect economic benefits. In a recent interview its founder recalls battling on the front lines of environmental legislation for twelve years before coming to the realization that “[m]ost CEOs would love to lower their environmental impacts if they could still make a profit. The problem is that we operate in a bad system—one that fails to reward good environmental

PROSPERITY, OPTIONS FOR MANAGING INDUSTRIAL AIR POLLUTION IN CANADA: THE USE OF MARKET-BASED INSTRUMENTS (2011), *available at* <http://www.sustainableprosperity.ca/article1489>.

284. At a smaller scale, individuals who cannot reduce their carbon footprint may purchase offsets through a fee—such as a charge on an airplane ticket—that will then be allocated to some project that can offset the flyer’s impact, such as planting carbon-absorbing trees.

285. TAMRA GILBERTSON & OSCAR REYES, CARBON TRADING – HOW IT WORKS AND WHY IT FAILS 25 (2009).

286. Keith Stewart, *Avoiding the Tragedy of the Commons: Green Governance Through the Market or the Public Domain?*, in THE MARKET OR THE PUBLIC DOMAIN?: GLOBAL GOVERNANCE AND THE ASYMMETRY OF POWER (Daniel Drache ed., 2001), *available at* http://www.yorku.ca/drache/talks/pdf/apd_stewartfin.pdf.

287. *Carbon Pricing, Climate Change, and Fiscal Sustainability in Canada* (Policy Brief), SUSTAINABLE PROSPERITY (Dec. 2010), <http://www.sustainableprosperity.ca/dl290&display>.

288. *Why Green Business is Crucial*, SUSTAINABLE PROSPERITY (Aug. 10, 2010), <http://www.sustainableprosperity.ca/article251>.

behaviour.”²⁸⁹ In the true win-win spirit of ecological modernization, the organization declares: “Nobody should have to make sacrifices in order to do things that are good for the environment. For individuals doing the right things should be cheaper than doing the wrong thing. For business, it should be more profitable.”²⁹⁰ The key is “to design regulations differently, so they promote eco-efficiency.”²⁹¹

Market-based strategies, like green tax shifting or emissions trading are central to Sustainable Prosperity’s approach. Emissions trading is seen as not only necessary to avoid runaway climate change, but as an important way to assist poor countries to develop in environmentally friendly ways—“like foreign aid but better.”²⁹² Developing a range of ecosystem markets is highly encouraged. These would include such things as conservation banking which compensates for plants and animals species harmed by a development by creating a habitat that provides for a similar number of species or plants; wetland mitigation banking that allows a developer to compensate for damage to a wetland in one place by restoring or enhancing a degraded wetland in another place, preserving an existing wetland, or even creating a new wetland; or biodiversity offsets which create new protected areas or conservation projects outside an area that is negatively impacted by development. Other trading schemes include nutrient trading, where industrial polluters pay farmers to reduce their nutrient loading of a waterway in place of limiting their own discharges; and renewable energy credits that allow energy companies to meet renewable energy targets by buying

289. Lynn Moore, *We Operate in a Bad System*, MONTREAL GAZETTE, Aug. 5, 2010 (interview with Stewart Elgie), available at <http://www.sustainableprosperity.ca/article251>.

290. *What We Do*, SUSTAINABLE PROSPERITY, <http://eoesi.com/docs/Sustainable%20Prosperity/Sustainable%20Prosperity-Web%20Material.pdf> (last visited Mar. 23, 2013).

291. *2010/11 Report 2*, SUSTAINABLE PROSPERITY, <http://www.sustainableprosperity.ca/dl453> (last visited Mar. 6, 2013).

292. Stewart Elgie & Dan Gagnier, *Emissions Trading: Like Foreign Aid but Better*, GLOBE & MAIL, Mar. 21, 2007, available at http://www.iisd.org/pdf/2007/iisd_innovator_may_2007.pdf. Incidentally, Dan Gagnier was Chair of the International Emissions Trading Association at the time the article was written.

credits from elsewhere.²⁹³ These strategies are designed to overcome the failure to accord priced values to nature's services by bringing market values to nature.²⁹⁴ The aim is to create the right conditions so that "market forces reward investments in ecosystem services" thereby creating a positive feedback loop where "increased investments in ecosystem services leads to increased production of ecosystem goods, eventually fuelling both sustainable economic growth and ecological restoration."²⁹⁵ This approach, as Sustainable Prosperity's website notes, is firmly situated within "non-controversial, standard microeconomics."²⁹⁶

Many other environmentalists have also turned to the "realistic" strategies of ecological modernization aimed at greening market valuations rather than more problematic attempts to transform the basic dynamics of growth and capital accumulation that provide the over-riding context for market pricing and behaviors. The discourse of efficiency has provided a bridge for environmental groups to cooperate with government and corporations rather than staying locked in an uphill battle against them with limited chances for success.²⁹⁷ As Arthur Mol

293. Alex Kenny et al., *Advancing the Economics of Ecosystems and Biodiversity in Canada: A Survey of Economic Instruments for the Conservation and Protection of Biodiversity*, SUSTAINABLE PROSPERITY (2011), available at <http://www.sustainableprosperity.ca/dl534&display>; see also, *Eco Markets Introduction: Conservation Background*, ECOSYSTEM MARKETPLACE, http://www.ecosystemmarketplace.com/pages/dynamic/web.page.php?page_name=e_markets_intro§ion=about_us (last visited May 22, 2012).

294. Kenny et al., *supra* note 293, at 9 (Prices should, theoretically, "reflect the marginal change in value of the affected ecosystem service due to its use." While acknowledging that calculating the value of ecosystem services can be "tricky," they maintain that such challenges should not stop policy makers from creating incentives based on prices).

295. *Id.* at 3, 4 (Ecosystem services are defined as "the benefits people obtain from ecosystems," and include such things as food, genetic resources for pharmaceutical research, bees for pollination, forests for controlling flooding and soil erosion, watersheds that produce clean water, etc.); see also, *Ecosystem Services*, ECOSYSTEM MARKETPLACE, http://www.ecosystemmarketplace.com/pages/dynamic/web.page.php?page_id=7182§ion=about_us&eod=1#es_3 (last visited May 22, 2012).

296. Background Paper, *Smart Budget: A Background Paper on Environmental Pricing Reform for Local Governments*, SUSTAINABLE PROSPERITY (2010).

297. See JOHN DRYZEK, GREEN STATES AND SOCIAL MOVEMENTS: ENVIRONMENTALISM IN THE UNITED STATES, UNITED KINGDOM, GERMANY AND

observes: “A change in ideology and strategy seemed to provide environmental NGOs with better access to both the general public and the core of policy communities in the environmental field.”²⁹⁸ And so environmental groups from Sustainable Prosperity to WWF, Environmental Defense, and Greenpeace now partner with major corporations to further their “shared” economic/environmental agendas.²⁹⁹

In short, ecological modernization and the allegiances it generates has become the dominant strategy of the age. By making a case for the “greening of business” as not only a feasible solution to the environmental crisis but a profitable one, ecological modernizers appear to overcome the contradiction between economic growth and environmental quality. After all, who would disagree with steady-state economist, Herman Daly, when he says that “the market is the most efficient institution we have come up with.”³⁰⁰ Who would want to refuse the prospect of solving the environmental crisis not by questioning the capitalist growth model, but by intensifying it? As Hawken et al. put it, “It is easier . . . to ride a horse in the direction it is going.”³⁰¹

NORWAY (2003) (the extent to which the environmental movement engages with the state on ecological modernization depends on the degree to which a state allows for their inclusion. For example corporatist arrangements encourage moderate environmental organizations and other “stakeholders” to accept the agenda of a weak ecological modernization while more exclusionary arrangements force social movements to pursue their goals outside the state).

298. Arthur Mol, *The Environmental Movement in an Era of Ecological Modernisation*, 31 *GEOFORUM* 45, 49 (2000). This in turn led to the marginalization of more radical elements of the environmental movement resulting in the polarisation of positions within the movement between the “fundamentalists” and the “realists.”

299. See Michael Dorsey, *Climate Knowledge and Power: Tales of Skeptic Tanks, Weather Gods, and Sagas for Climate (In)justice*, 18 *CAPITALISM, NATURE, SOCIALISM* 7, 10 (2007). He notes, for example, Environmental Defense’s cooperation with BP-Amoco in 1999 to pilot the first major corporate greenhouse gas emissions trading scheme; Greenpeace’s collaboration with the World Business Council for Sustainable Development (chaired by the ex-chair of Royal Dutch Shell) to promote ratification of the Kyoto Protocol at the 2002 World Summit on Sustainable Development; and WWF’s eager promotion of carbon trading.

300. HERMAN DALY & JOHN B. COBB, *FOR THE COMMON GOOD* 46 (2d ed. 1994).

301. HAWKEN ET AL., *supra* note 278, at 166.

VI. ECOLOGICAL CONTRADICTIONS

As we turn here from liberal apologia to green critique, let us recall two basic lessons of the case studies with which we began this article. First, externalities are not accidental events but pervasive cost shifts that are inherent to the design *and success* of entire industrial structures. Second, these structures were directly shaped, extensively financed, and continuously supported by the state that is now to be the vehicle for the new modernizing innovations. These lessons have profound implications for our social/environmental relations generally and, more particularly, for the future character of environmental law. And so the question remains: does the challenge for environmental law lie in developing responses to markets that do not presently reflect full economic valuations or state-of-the-art efficiencies? Or do we need to address the basic dynamics of the industries from which market failures flow and for which enhanced efficiencies seem to offer insufficient potential? In other words, can the environmental challenge be solved by perfecting the “economics” and passing new “legal laws” promulgated within an accepted political/economic context? Or must environmental law (or whatever it evolves into) go further in order to address the “constitutive dynamics” of a constructed “political economy” of industries that inherently generate structural economic (and environmental) consequences that resist correction, especially by a state itself so implicated in the history and functioning of these industries? Hawken’s horse may be saddled with a more compliant rider, but what help is that if it is simply racing faster toward an abyss?

A. Lessons from Ecological Theory

Throughout this paper, we have articulated a new “green legal” critique intended to shift analysis beyond the bounds of both the neoclassical/mainstream economic calculus and liberal theory to one informed by what might be understood as an “ecological political economy.” The following discussion, though of a more general nature that addresses economic and political dynamics, is directly relevant to environmental law because it is in this larger context where new larger forms of socially-

constitutive (e.g. legal writ large) regulation must be developed. Certainly, efficiency has an important place in an ecological economy. Using less energy and fewer resources to do the same thing makes obvious sense—why generate needless waste? Moreover, great improvements can be made in efficiency and, to a degree, even leading to some sort of industrial conversion. The Germans trumpet their achievements with, in 2012, 20% of their energy coming from renewables that they promise will completely displace nuclear power by 2030.³⁰² As well, organizations like Sustainable Prosperity make many useful proposals for reform in such areas as development cost charges in urban development, energy efficiency, and so on. Meanwhile, dramatic reforms such as constitutionalizing the right to a healthy environment can have significant incremental impacts.³⁰³

As we have also seen, however, after more than two decades of a market- and technology-based approach, ecological modernization has been unsuccessful in altering the trajectory of ecological collapse. Within an unproblematized economic/political context, efficiency gains easily lead to their opposite, more growth. As Richard Smith notes, “under capitalism, the whole point of using resources efficiently is just to use the saved resources to produce even more commodities, to accelerate the conversion of even more natural resources into products . . . so the cycle can begin all over again.”³⁰⁴ Throughout history efficiency

302. See CHRIS TURNER, *THE GEOGRAPHY OF HOPE TORONTO* (2007) (describing the German green industrial strategy); see also Chris Turner, *Germany's Sustainable Revolution*, *GLOBE & MAIL*, Jan. 30, 2012, at B9 (original source for figures in *THE GEOGRAPHY OF HOPE TORONTO*). It bears repeating that “renewables” are not unproblematic in their impacts and costs. In its praise of state-sponsored corporate innovation and growth, this article makes no mention of overall reductions in levels of consumption, the externalities generated by renewables, their high costs and the huge subsidies they demand, the continuing impacts of economic growth on energy demand, and so on.

303. See BOYD, *supra* note 222 (noting in a review of over 100 countries, that the constitutional right to a healthy environment has led not only to stronger environmental laws, but also legislation and litigation that compels governments to provide basic environmental services such as clean drinking water, sanitation, and waste management); see also *id.* at 238 (noting the constitutional right to a healthy environment has led to compensation of citizens, whose health has been detrimentally affected by industrial pollution in countries such as Peru, Russia, Romania, Chile, and Turkey).

304. Smith, *supra* note 238, at 40-41.

gains in technology have, in fact, often translated into *increasing* levels of consumption overall. This is recognized by mainstream economics as a beneficial result, increasing productivity in order to get more (not the same) for less.

The original explanation for this seeming paradox was provided by the nineteenth century British coal economist, William Stanley Jevons, in his classic work, *The Coal Question*.³⁰⁵ Jevons observed that technological advancements leading to more efficient use of coal did not result in a decrease in coal consumption but rather made coal a more cost effective energy source for generating more profits and further economic expansion.³⁰⁶ Taking the example of iron manufacturing, he explained that if the quantity of coal used in a furnace declines in comparison to the unit of production, profits will increase, new capital will be attracted and the price of the product will decline, which will in turn create an increase in demand for it. Thus, any reduction in the use of coal as a result of improved efficiency will eventually be overtaken by a greater number of furnaces and expanded production.³⁰⁷ Jevons wrote: “It is wholly a confusion of ideas to suppose that the economical use of fuel is equivalent to a diminished consumption. The very contrary is the truth.”³⁰⁸ (Instead, Jevons’ counter-intuitive explanation is fully compatible with the mandate for market expansion necessitated by competitive capitalism, as discussed above.)

“Jevons’ paradox” or the “rebound effect” as this insight is also known, has been on full display in places like the U.S. where, at both a micro- and macro-economic level, economic growth repeatedly overtakes efficiency gains. As Juliet Schor notes, “demand is rising fastest in those sectors that have had the biggest efficiency gains—transport and residential energy use.”³⁰⁹ For example, people driving bigger cars over longer distances

305. William Stanley Jevons, *Of the Economy of Fuel*, 14 ORG. & ENV’T 99 (2001) (reprint of chapter 7 of WILLIAM STANLEY JEVONS, *THE COAL QUESTION* (1865)); see also Blake Alcott, *Jevons’ Paradox*, 54 ECOLOGICAL ECON. 9 (2005).

306. Jevons, *supra* note 305.

307. *Id.* at 100.

308. *Id.* at 99.

309. JULIET SCHOR, *PLENITUDE: THE NEW ECONOMICS OF TRUE WEALTH* 91 (2010).

overtook the savings gained from improved fuel efficiencies in car engines in the 1970s.³¹⁰ Similarly, although fuel efficiency in aviation improved by more than 40% since 1975, fuel consumption grew by 50% as a result of more passenger flights.³¹¹ The building industry is another sector applauded for its notable gains in energy efficiency, yet energy use since 1978 has actually increased by 30% for residential buildings and over 65% for commercial buildings in the U.S.³¹² Energy efficiency has been overtaken by such things as larger building size, air conditioning, exercise rooms, swimming pools, home saunas, and a plethora of appliances and home electronics.³¹³ In other words, efficiency gains actually *fuel* macro-economic growth, and are widely praised for such an effect.³¹⁴

310. See KRAFT, *supra* note 27, at 169 (including note 10) (noting that between 1995 and 2001, Congress ensured that fuel economy standards for vehicles were not reviewed or changed despite the fact that the average fuel economy of American vehicles was at the lowest level since 1980. He further notes that the 2003 model of cars and passenger trucks had an average fuel efficiency of 20.8 miles per gallon—6% less than the fuel efficiency high of 15 years earlier. In 2006, a modest increase in fuel economy standards was announced for SUVs, pickup trucks, and vans with projected fuel savings of 8%).

311. SCHOR, *supra* note 309, at 9.

312. Jeffrey Harris et al., *Don't Supersize Me! Toward a Policy of Consumption-Based Energy Efficiency*, in 2006 ACEEE SUMMER STUDY PROCEEDINGS (2006), http://epb.lbl.gov/homepages/rick_diamond/sufficiency%20aceee%2006.doc.pdf.

313. *Id.*

314. GREENPEACE INT'L, HOW DIRTY IS YOUR DATA? A LOOK AT THE ENERGY CHOICES THAT POWER CLOUD COMPUTING 11 (2011), <http://www.greenpeace.org/international/Global/international/publications/climate/2011/Cool%20IT/dirty-data-report-greenpeace.pdf> (Resource efficiency is also touted as a major benefit resulting from the revolution in information and communication technologies. However, as a recent Greenpeace report notes, if the internet were a country it would rank fifth in electricity usage just behind Japan.); see also Kris De Decker, *The Monster Footprint of Digital Technology*, LOW-TECH MAGAZINE (June 16, 2009), www.lowtechmagazine.com/2009/06/embodied-energy-of-digital-technology.html (moreover, while computers have become smaller and more energy efficient in their operation, they are nevertheless constructed out of exotic ("rare earth") elements and require increasing amounts of energy to build them. The energy embodied in a single laptop's memory chip alone "exceeds the energy consumption of a laptop during its life expectancy of three years."); Eric William et al., *The 1.7 kg Microchip: Energy and Material Use in the Production of Semi-Conductor Devices*, 36 ENVTL. SCI. & TECH. 5504 (2002); Eric Williams, *Environmental Impacts in the Production of Personal Computers*, in COMPUTERS AND THE ENVIRONMENT (Reudiger Kuehr & Eric Williams eds., 2003) (an analysis

As a transitional strategy, enhanced resource efficiency has much to offer but only when approached as a first step to larger changes within a larger context. As Fournier puts it, “The problem is not with these eco-efficiency technologies themselves . . . but with their inscription within a paradigm of growth: their deployment towards increased consumption and production.”³¹⁵ This is because a strategy of eco-efficiency in an economy of growth is time-limited and quickly self-defeating as improved efficiencies become ever more costly to attain, at the same time as they are quickly outrun by expanded production. Indeed, unless eco-efficient growth is oriented to creating new institutions that do not themselves depend on growth, the result will be to create a still larger, over-extended economy but without the inefficiencies that are now available to cushion a transition. Thus would fuel efficiency lead not to car-free cities but to more (bio)diesel or battery-powered automobiles funneling onto ever more congested freeways for ever greater numbers of downtown office complexes remote from where people live. With resources going to maintain or extend the infrastructure of “automobility” (e.g. freeways and overpasses), that money and physical resources are not available to build rail or tram lines or a bicycle infrastructure, let alone to rebuild the economy that demands such mobility in the first place. Such systemic changes require collective political choice, not just individual economic decisions.

This is a general problem with market mechanisms as they may work well to make incremental decisions but not to make collective, transformative ones. Changes in degree do not easily lead to changes in kind and, in fact, often work to pre-empt them. The latter requires a collective attention to the basic systems themselves, including the ability to address the historical economic benefits and dependencies that they have generated, and that in turn generate resistance to change. And, of course, prices are a poor guide to system change as prices themselves reflect the existing distributions and dependencies of established industrial systems, and of the associated attitudes and values

of energy and material inputs reveals that for every gram of a microchip, 630 grams of fossil fuels are required. This means that the memory chips for a single computer embody roughly 94 kg of fossil fuel.).

315. Fournier, *supra* note 276, at 532.

that are socially-constructed by them. This is why GLT points to a paradigm shift away from manipulating the *internal* mechanisms of neoclassical economics (e.g. carbon taxes that lead to hybrid cars) to developing *external* strategies that can foster a new ecological political economy (e.g. eco-industrial programs to phase out the urban automobile).

The potential benefits from enhanced resource efficiency thus cannot be separated from the larger contexts within which these efficiencies actually accrue, especially that generated by the dynamics of capitalist economics. Taken from the perspective of the production unit, “the most efficient production method, technology, or economic system is the one that gets the most output from the least input, so produces the cheapest widgets and generates the most product/sales/wealth for a given investment of labor and raw materials.”³¹⁶ On this calculus, mountain top removal may well be the most “efficient” method of mining coal even though it results in extensive destruction of forests, habitat, watersheds, and communities.³¹⁷ Similarly, it may be most efficient for fishing trawlers to use satellite-guided navigation systems to maximize their catches even though it leads to the overexploitation and collapse of fisheries.³¹⁸ And if industrial agriculture’s use of toxic pesticides and synthetic fertilizers can bring higher yields, then it must be the most efficient method of farming even if it depletes soil, pollutes water, and strips food of its nutritional value.

One can construct all the scenarios for internalizing these costs as one might want—but today’s prices reflect past patterns not future realities, as do political interventions. Given the cost-shifting nature of state-constructed regimes, many core industrial activities such as plastics manufacturing, metal mining, car

316. Smith, *supra* note 238, at 39.

317. *Id.* at 40; see also PLUNDERING APPALACHIA: THE TRAGEDY OF MOUNTAINTOP REMOVAL COAL MINING 1 (Tom Butler & George Wuerthner eds., 2009) (The process of mountaintop mining in Appalachia is described as turning “an entire region into an undeclared national energy sacrifice zone”).

318. Smith, *supra* note 238, at 40; see also Ransom Myers & Boris Worm, *Rapid Worldwide Depletion of Predatory Fish Communities*, 423 NATURE 280 (2003); Heike Lotze, *Repetitive History of Resource Depletion and Mismanagement: The Need for a Shift in Perspective*, 274 MARINE ECOLOGICAL PROGRESS SERIES 282 (2004).

manufacturing, and oil extraction could well go out of business if they were to internalize their full social and environmental externalities. Serge Latouche remarks, “with proper prices, civil aviation would come to a halt, and there would probably not be many cars in the world.”³¹⁹ If “efficiency” were considered from a broader standpoint than a neoclassical calculus—personal and community and ecological health, global equity and security, even collective “utility”—a very different picture would emerge. But such changes would entail actively reducing market demand (inimical to the growth economy) so that coal-fired power plants could simply be closed and collective decisions made to build trams and close freeways (inimical to established industrial systems). These are issues of collective decision, not technocratic calculation, of “re-formation” not reform. That there is a choice here is not because reforms are inherently useless; it is because the re-formative context for their proper functioning is absent.

B. Lessons from Economic Practice

a. The Case of Carbon and Green Development

If all this seems obvious to the sympathetic reader, it is not so to anyone working in the bureaucratic let alone corporate corridors of power where system maintenance and extension is the “realistic” context. It is thus not surprising that the actual experience with market-based schemes that are supposedly designed to reduce climate impacts has instead provided for the very opposite—for “new outlets for accumulation” through financializing a hitherto unpriced entity where the primary goal is to make profits from carbon emissions, not to reduce such opportunities by taking actions that would slash such emissions.³²⁰ Some critics go so far as to argue that, rather than contributing to a solution to climate change, pricing strategies that underlie carbon taxes, trading, and offsets may actually

319. SERGE LATOUCHE, *FAREWELL TO GROWTH* 74 (2009).

320. Giorgos Kallis, *In Defense of Degrowth*, 70 *ECOLOGICAL ECON.* 873, 878 (2011).

contribute to the problem.³²¹ Gilbertson and Reyes note that all carbon trading schemes to date have started by awarding the worst polluters with the largest numbers of free pollution rights.³²² This amounts to “one of the largest projects for the creation and regressive distribution of property rights in history.”³²³ In many cases, governments have handed over more pollution rights than polluters needed to meet their legally-mandated targets. For example, in the first phase of the EU Emissions Trading Scheme (the world’s largest and longest established carbon trading scheme) polluters were allocated an extra 130 million tonnes of carbon permits over what they actually emitted.³²⁴ With a surplus of permits, firms had little or no incentive to cut back emissions.³²⁵ The next five-year period of the trading scheme which ended in 2012 is expected to result in a mere 0.3% reduction in total emissions.³²⁶ Even this small drop is a telling indicator of the real source of the carbon problem (and its solution) insofar as the reduction was attributable to the 2008-2009 economic slowdown that resulted in a drop in emissions in traded sectors by 6% in 2008 and a stunning 11.6% in 2009.³²⁷ Similarly, carbon emissions in the U.S. dropped by 7% in 2009

321. See Larry Lohmann & Sarah Sexton, *Carbon Markets: The Policy Reality*, 10 GLOBAL SOC. POL’Y 9 (2010); GILBERTSON & REYES, *supra* note 285.

322. GILBERTSON & REYES, *supra* note 285, at 10.

323. *Id.* at 10.

324. *Id.* at 34. Carbon permits were over-allocated by 36.9% in 2005, 26.9% in 2006, 25% in 2007, and 31.7% in 2008. *Id.* at 43; see also *Questions and Answers on the Revised EU Emissions Trading System*, EU COMM’N (Dec. 18, 2008), <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/796> (last visited May 22, 2012) (the EU itself acknowledges the failure noting that “The environmental benefit of the first phase may be limited due to excessive allocation of allowances in some Member States and some sectors...”).

325. See GILBERTSON & REYES, *supra* note 285, at 35, 43-44 (while the EU blames the over-allocation on a lack of accurate emission projections, the concern not to overload the constraints on the economy is omnipresent. As well, corporate influence undoubtedly played a significant role, and the sale of excess profits has led to windfall profits).

326. DAMIEN MORRIS & BRYONY WORTHINGTON, CAP OR TRAP? HOW THE EU ETS RISKS LOCKING IN CARBON EMISSIONS 7 (2010), available at http://www.sandbag.org.uk/site_media/pdfs/reports/caportrap.pdf; see also GILBERTSON & REYES, *supra* note 285, at 315.

327. MORRIS & WORTHINGTON, *supra* note 326, at 5; see also David Gabel, *US Cut its CO2 Emissions by 7% Last Year*, ENVTL. NEWS NETWORK (May 6, 2010), <http://www.enn.com/pollution/article/41295> (last visited May 22, 2012).

which corresponded to a 2.4% drop in GDP. According to the U.S. Energy Information Administration, it was the largest drop in carbon emissions since the agency began keeping comprehensive records in 1949.

The European scheme also allows a corporation to “bank” its allocated permits. As a result, the decreased industrial output during the recession meant that big polluters could carry over their surplus permits into the next phase of the trading scheme in 2013. For the top ten most over-allocated companies in 2008, their surplus of permits could allow them collectively to increase their emissions by 50% above 2009 levels by 2020.³²⁸ A report by the non-governmental organization, Sandbag, comments:

As the essence of the scheme is to distribute carbon allowances to private companies, there is little recourse for reclaiming excess permits once they have been allocated. Furthermore, there is considerable inertia in the scheme with decisions affecting future fixed supplies of permits dictated many years in advance making them vulnerable to incorrect assumptions and unexpected events.³²⁹

Once again, efficient allocation becomes its opposite: “With emissions now below the level of the cap, the cap has become a trap—guaranteeing high levels of emissions into the future rather than working to deliver reductions.”³³⁰

Even more controversial are carbon offset mechanisms that allow emissions reductions to take place outside the capped area through “emission-savings projects.” The UN Clean Development Mechanism (CDM) is the largest offset scheme with projects ranging from hydroelectric dam building and biomass projects to palm oil plantations and even coal-fired power plants. It has worked by allowing companies and governments in the northern industrialized countries to meet their emissions reductions mandated by the Kyoto Protocol by buying relatively inexpensive

328. MORRIS & WORTHINGTON, *supra* note 326, at 9. Among these top 10 over-allocated companies (in proportion to their emissions), most are steel and cement companies. The most over-allocated company, SSAB Steel, is projected to be able to increase its 2009 emissions 250% by 2020.

329. *Id.*

330. *Id.* at 5.

carbon credits or offsets from projects developed in low income countries. In many cases, however, the project's claimed emissions reductions reflect hypothetical scenarios that cannot be proven.³³¹ But even where the claimed reductions turn out to be accurate, they simply cancel out the carbon emissions produced by the buyer of the offset. Thus, in a perfectly implemented system, the net result would be neutral. However, since a significant proportion of projects sold as offsets would have proceeded regardless of funding, and the credits they generate allow an industry elsewhere to exceed their emissions cap, the CDM actually ends up increasing rather than decreasing global carbon emissions.³³² This is another instance of the pattern common to the state-guided development that we have seen in our earlier case studies of these very industries.

Even worse, some of the offset projects lead to significant environmental or social costs in the host country, such costs effectively subsidizing production in the industrialized country that bought the offsets. In the Greater Mekong subregion, eight hydropower projects have applied for CDM credits.³³³ With the majority of people dependent on the rivers for their livelihood, culture, and food security, most of these projects will, on top of the threats they pose to important biodiversity and fish migration routes, have devastating impacts on communities that live along these rivers. For example, one of the first to apply for CDM credits was the Xeset 2 Hydropower Project, and it will dewater the Xeset and two other rivers. As a result, the NGO, International Rivers, complains that more than 18,000 people including many indigenous peoples "will lose domestic water

331. See Larry Lohmann, *Toward a Different Debate in Environmental Accounting: The Cases of Carbon and Cost-benefit*, 34 ACCOUNTING, ORGS. & SOC'Y 499, 504ff (2009); see also MORRIS & WORTHINGTON, *supra* note 326, at 56 (a project simply has to prove that "it is cleaner than the norm for existing power production in the region or country where it is located. As new plants are generally more efficient than old ones, this is rarely a difficult task.").

332. GILBERTSON & REYES, *supra* note 285, at 53. Chapter 4 covers a range of case studies of the Clean Development Mechanism in Brazil, Indonesia, India, and Thailand exposing how such projects routinely support ineffective and socially unjust projects.

333. They are part of the more than 100 major dams, diversions, and irrigations projects planned, and thousands smaller schemes already in place in the Mekong River Basin.

sources, wild fisheries, irrigation water, vegetable gardens, water for raising fish, and recreational and income generating opportunities.”³³⁴ While the government of Laos claims to have conducted consultation processes, “in a one-party communist state that does not tolerate dissent, consultation processes are rubber-stamping devices where communities feel afraid to speak out or raise concerns due to fear of repercussions.”³³⁵ If Xeset 2 is approved, “it could open the floodgates for similar non-additional and poorly designed and developed hydropower projects.”³³⁶ Another example is the Allain Duhangan Hydropower Project in Himachal Pradesh, India, one of the largest hydropower projects to get credits under the CDM. Like villages along the Xeset 2, the village of Jagatsukh will be detrimentally affected by the 192 MW dam that will divert creeks that farmers depend on for their livelihood and food security.³³⁷ Despite strong local opposition to the dam since its inception in 2003, the project is slated to receive around 4.94 million Certified Emissions Reduction credits.³³⁸

334. *International Rivers Comments on Xeset 2 Hydropower Project, Lao PDR 1*, INT’L RIVERS (Aug. 7, 2009), <http://www.internationalrivers.org/resources/comments-to-bv-cert-regarding-xeset-2-hydropower-project-laos-3121> (last visited May 22, 2012).

335. *Id.*

336. *Id.*; see also Philip Hirsch, *The Changing Political Dynamics of Dam Building on the Mekong*, 3 WATER ALTERNATIVES 312 (2010).

337. About 2,000 people live in the village of Jagatsukh and almost all oppose the project. The project will also destroy habitat used by threatened, rare or endangered species. See Terri Martin, *Muting the Voice of the Local in the Age of the Global: How Communication Practices Compromised Public Participation in India’s Allain Duhangan Environmental Impact Assessment*, 1 ENVTL. COMM. 171, 176 (Nov. 2007); *Comments on the ESIA of the Proposed Allain Duhangan HEP*, SOUTH ASIAN NETWORK OF DAMS, RIVERS AND PEOPLE (2003), http://www.internationalrivers.org/files/attachedfiles/flawed_environmental_and_social_impact_analysis_pdf.pdf (last visited May 22, 2012).

338. The 4.94 million credits derive from the total estimated reductions of 4,946,648 tonnes of CO₂ over the project’s 10 year period. UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, *CDM Project Design Document Form* (for Allain Duhangan Hydroelectric Project) 5 (2007), available at <http://cdm.unfccc.int/filestorage/L/Y/Z/LYZSN7J5RUYN08DZTC236SF3POYNWK/PDD.pdf?t=ZFZ8bWxmMzQyfDB92RmTymFGCyS3ip3Wo-sE> (last visited May 22, 2012); *The 75 Million Dollar Fraud*, SOUTH ASIAN NETWORK ON DAMS, RIVERS AND PEOPLE, http://www.sandrp.in/comments_CDM_HEPs/Allain_Duhangan.pdf (last visited May 22, 2012) (using the 2010 EU ETS average market rate of around U.S. \$16 per credit, this would come out to around \$75 million).

With larger plans to add 150,000 megawatts of hydropower to the Himalayan region, the situation risks being repeated hundreds of times throughout the region.³³⁹ While these and other major hydroelectric developments are promoted as being “in the public interest” most projects are developed not to meet local needs for electricity, but to feed the growing demand of South Asia’s urban industries and middle classes.³⁴⁰ The real decision makers, moreover, are global corporations and their institutional financial backers.³⁴¹ The overriding motive is to increase energy supply for producing computers, textiles, and other consumer goods for the world’s wealthy, while literally hundreds of small-scale communities are vanquished, taking with them diverse ways of living, knowledge systems, and cultural practices.

The examples go on. Although the topic deserves more detailed analysis than can be presented here, it is important to note how the massive offset program, REDD (or Reducing Emissions from Deforestation and Degradation) follows this same pattern and on a grand scale. In this case, southern countries sell the carbon-sink capacity of their forests to northern countries. These top-down models increase expert and state control over forests thus amplifying the risk of violating the sovereignty of indigenous peoples and their right to prior, free, and informed consent. As a result, these schemes are strongly opposed by many indigenous and forest peoples who fear that such policies will lead to “anti-people and exclusionary models of forest conservation . . . to protect lucrative forest carbon ‘reservoirs.’”³⁴²

339. See SHRIPAD DHARMADHIKARY, *MOUNTAINS OF CONCRETE: DAM BUILDING IN THE HIMALAYAS* (2008), http://www.internationalrivers.org/files/attached-files/ir_himalayas.pdf (last visited May 22, 2012).

340. *Id.* at 1.

341. Philip Hirsh, *Beyond the Nation State: Natural Resource Conflict and “National Interest” in Mekong Hydropower Development*, 29 *GOLDEN GATE U. L. REV.* 399, 411 (1999).

342. TOM GRIFFITHS, *SEEING ‘RED’? ‘AVOIDED DEFORESTATION’ AND THE RIGHTS OF INDIGENOUS PEOPLES AND LOCAL COMMUNITIES* (2007), *available at* http://www.forestpeoples.org/sites/fpp/files/publication/2010/01/avoideddeforestationredjun07eng_0.pdf (last visited May 22, 2012); For a critique of a project widely considered to be a model for REDD, see ARIANA DENSHAM ET AL., *CARBON SCAM: NOEL KEMPF CLIMATE ACTION PROJECT AND THE PUSH FOR SUB-NATIONAL FOREST OFFSETS* (2010), <http://www.greenpeace.org/usa/Global/usa/report/2010/1/carbon-scam-noel-kempff-clima.pdf> (last visited May 22, 2012).

This large scheme, the many specific projects worldwide, and the whole array of carbon markets and offset mechanisms all reflect a common, double-edged phenomenon. On the one hand is the displacement of *substantive* action to address real environmental problems and its accompanying problematic. On the other hand is the promotion of the pricing mechanism as a *procedural* tool with the technical allure that rewards enviro-capitalism while it lets the state off the hook for substantive action. This pervasive process is now reaching into the tiniest of ecological crevices with the growing application of pricing to all manner of ecosystem services. As Dempsey and Robertson note, such strategies “simplify the complexity of natural ecosystems, prioritize single exchange values over ecological complexity, and mask the unequal social relations embedded in the process of buying and selling environmental services.”³⁴³

b. When Clean Energy Meets Economic Growth

The rush to clean energy production reflects a similar pattern where, again, historical interests and imperatives prevail, and incrementalism confronts systemic obstacles. As Vaclav Smil argues, it is one thing to hypothesize a revolution in energy production, and another thing to attain it.³⁴⁴ For example, a clean energy revolution based in renewable production would “greatly increase the fixed land requirements of energy production and necessitate more extensive rights-of-way for transmission.”³⁴⁵ In addition, since the energy density of

343. Jessica Dempsey & Morgan Robertson, *Ecosystem Services: Tensions and Developments within Neoliberal Environmentalism*, PROGRESS IN HUMAN GEOGRAPHY (forthcoming); Inge Røpke, *Trends in the Development of Ecological Economics from the Late 1980s to the Early 2000s*, 55 ECOLOGICAL ECON. 262, 279 (2005) (contingent valuation provides decision makers with a simplistic technical solution that may be used to justify policies while simultaneously evading fundamental moral and political dilemmas. The source concludes that “prices are not worth much” since not only are many factors unquantifiable and incommensurable, but prices are necessarily a reflection of historical and existing power structures).

344. See Vaclav Smil, *Twenty-first Century Energy – Some Sobering Thoughts*, ORG. FOR ECON. CO-OPERATION & DEV. (Dec. 2006), at 22-23, http://www.oecdobserver.org/news/fullstory.php/aid/2083/21st_century_energy:_Some_sobering_thoughts.html.

345. *Id.*

renewable fuels is lower than fossil fuels, no readily available renewable energy source of a large enough scale presently exists.³⁴⁶ There are also the problems of intermittency of renewable flows, lack of storage, and uneven distribution of favorable sites.³⁴⁷ Even if there were alternatives immediately available, the financial cost for broad deployment would be enormous and would mean writing off the existing infrastructure for extracting, transporting, and refining fossil fuels worth well over \$5 trillion.³⁴⁸ Moreover, even with extraordinary commitment, such a transition requires decades. One of the most committed countries like Denmark, after 30 years, still gets 20% of its power from windmills and 80% from coal.³⁴⁹ On the other hand, while addressing global warming is critical and urgent, a complete and rapid switch to clean energy (or dubious sources of “cleaner” energy such as the energy now touted as coming from

346. Ottmar Edenhofer et al., *Summary for Policy Makers*, in IPCC SPECIAL REPORT ON RENEWABLE ENERGY SOURCES AND CLIMATE CHANGE MITIGATION (O. Edenhofer et al. eds., 2011) (refuting such claims with its projection that renewable technologies could make up 80% of the world's energy by mid-century. While the report asserts that “there are few, if any, fundamental technological limits” to developing the renewable energy technologies outlined, it also notes that “the substantial increase of renewables is technically and politically very challenging.”); see also *World Energy Outlook 2011 Factsheet 2*, INT'L ENERGY AGENCY, <http://www.worldenergyoutlook.org/media/weowebiste/2011/factsheets.pdf> (the immense challenge involved in shifting away from fossil fuel to renewable fuel sources is underscored by the International Energy Agency's 2011 *World Energy Outlook*. Its central scenario projects that by 2035 world oil demand will *increase* by 15 million barrels per year while the use of coal will rise by 65%. The report points out that because of the long economic life of much of the world's energy-related capital stock such as power stations, buildings, and factories, some of this infrastructure will need to be retired early in order to limit global carbon emissions to 450 ppm. It contends: “This would theoretically be possible at a very high cost, but is probably not practicable politically.”).

347. SMIL, *supra* note 280, at 22-23.

348. See Vaclav Smil, *Moore's Curse and the Great Energy Delusion*, THE AM., Nov. 19, 2008, <http://www.american.com/archive/2008/november-december-magazine/moore2019s-curse-and-the-great-energy-delusion> (last visited May 22, 2012). “Moore's Law” refers to the tendency (observed by Intel cofounder, Gordon Moore) for a computer's power to double every 18 months. While some people have extended this observation to energy systems more generally, Smil emphasizes that the rapid technical innovation in computer processing does not represent the norm for energy systems.

349. *Id.*; see generally JEFF RUBIN, *THE END OF GROWTH* (2012) (discussing Denmark's progress).

“fracking”) would not stop destructive mining and forestry practices, nor overexploitation of global fisheries and water resources, nor the production of toxic chemicals and excessive garbage. On the contrary, “given the Jevons paradox, the advent of cheap, clean energy could even accelerate these trends.”³⁵⁰

One can understand the popularity of these strategies because, again, they promise to marry prosperity in the old mode with production in a new one. But no matter how great the risks entailed in achieving them, they cannot work for a simple reason: in a world driven by the relentless pursuit of economic growth, the benefits generated by clean technologies will be overtaken by the external costs inflicted by economic growth. For the green economy, this is the definitive party crasher. The government-appointed UK Sustainable Development Commission report, “Prosperity Without Growth,” makes this very clear. It notes that energy intensity (that is the amount of primary energy needed to produce a unit of economic output) has overall declined worldwide by 33% since 1970.³⁵¹ The drop in energy intensity for the U.K. and U.S. was even more dramatic—a 40% decline since 1980.³⁵² At the same time, however, because of overall economic growth, world carbon emissions from fossil fuels increased by a stunning 80% since 1970.³⁵³ Despite commitments within the Kyoto Protocol to bring greenhouse gas emissions below 1990 levels by 2012, current measurements of carbon emissions are 40% higher than they were in 1990.³⁵⁴

It is tempting to point the finger at rapidly industrializing countries such as China for the increase in emissions since

350. Richard Smith, *Green Capitalism: The God that Failed*, 56 REAL-WORLD ECON. REV. 112, 126 (2011).

351. TIM JACKSON, PROSPERITY WITHOUT GROWTH 48 (2009), available at http://www.sd-commission.org.uk/data/files/publications/prosperity_without_growth_report.pdf.

352. *Id.*

353. *Id.* at 50.

354. *Id.* In the Kyoto Protocol, thirty-seven industrialized “Annex I” countries agreed to reduce their average greenhouse gas emissions by 5% from 1990 levels by 2012. These targets exclude emissions from aviation and shipping. See Press Release, Industrialized Countries to Cut Green House Gas Emissions by 5.2 percent, U.N. Press Release (Dec. 11, 1997) available at <http://unfccc.int/cop3/fccc/info/indust.htm> (last visited May 22, 2012).

according to standard data, developed countries have reduced their collective emissions by almost 2% between 1990 and 2008.³⁵⁵ However, a recent report on international emissions transfers shows that wealthy countries have been lowering their emissions by sending production overseas.³⁵⁶ The Kyoto Protocol, developed at the height of the neoliberal era when heavy production was being moved offshore, assigns emissions to the country where they are physically released during production of goods. However, when emissions embedded in imports and exports are taken into account, developed countries end up with a collective increase in emissions of 7% while China's emissions drop by almost 20%.³⁵⁷ As a result, "emissions from increased production of internationally traded products have more than offset the emissions reductions achieved under the Kyoto Protocol."³⁵⁸ This means that "even if all the unenforceable pledges made in the Copenhagen Accord were honored, carbon cuts by the rich nations between now and 2020 would be cancelled out by their imports from developing countries" and "nothing will have been achieved."³⁵⁹

This is no incidental concern as economic growth remains the main policy goal of almost every government in the world. Speth notes that the size of the world economy has quadrupled from

355. See Duncan Clark, *New Data on Imports and Exports Turns Map of Carbon Emission on its Head*, GUARDIAN, (May 3, 2011), <http://www.guardian.co.uk/environment/datablog/2011/apr/28/carbon-emissions-imports-exports-trade> (discussing a summary of changes in carbon emissions between 1990 and 2008, both with and without consumption emissions, for individual countries and Annex B and non-Annex B countries collectively).

356. Glen Peters et al., *Growth in Emission Transfers via International Trade from 1990-2008*, 108 PROCEEDINGS OF THE NAT'L ACAD. OF SCI. 8903 (2011), available at <http://www.pnas.org/content/early/2011/04/19/1006388108.full.pdf+html>; see also Stephen Davis & Ken Caldeira, *Consumption-based Accounting of CO2 Emissions*, 107 PROCEEDINGS OF THE NAT'L ACAD. OF SCI. 5687-92 (2010).

357. Duncan Clark, *Carbon Cuts by Developed Countries Cancelled out by Imported Goods*, GUARDIAN (Apr. 25, 2011), <http://www.guardian.co.uk/environment/2011/apr/25/carbon-cuts-developed-countries-cancelled>. For example, once trade is included, the UK's emissions go from a reduction of 28 million tonnes in standard calculations to an increase of 100 million tonnes.

358. *Id.*

359. George Monbiot, *Pass the Parcel*, GUARDIAN (May 23, 2011), <http://www.monbiot.com/2011/05/23/pass-the-parcel/> (commenting on the Peters et al. report).

around \$10 trillion in 1960 to more than \$40 trillion in 2000.³⁶⁰ With this continuing momentum, economic activity is projected to quadruple again to \$160 trillion by mid-century.³⁶¹ Assuming the same rate of growth, by the end of the century the economy will be 80 times what it was in 1960.³⁶² This is obviously impossible considering that the economy's five-fold increase in size over the past half a century has already resulted in serious erosion of 60% of the world's ecosystems.³⁶³ As one critic remarked, "[I]n the face of mounting ecological disasters worldwide, from droughts to floods, desertification to species extinction, the continued insistence on the efficacy of technological and market solutions and the concomitant denial that the capitalist principle of infinite growth is unsustainable can only be qualified as pathological."³⁶⁴

To further illustrate the point, Jackson and colleagues estimated the level of technology that would be required to meet an atmospheric carbon concentration of 450 ppm by 2050, as suggested by the IPCC Fourth Assessment Report.³⁶⁵ This would require a reduction in carbon emissions by 4.9% *per year* between now and 2050.³⁶⁶ Using the I=PAT formula,³⁶⁷ they calculated that in a business-as-usual scenario, a decline in carbon intensity (T) of 0.7% per year (the average decline since 1990) would balance out the expected 0.7% per year growth in population (P) (based on the UN's mid-range projection).³⁶⁸ Carbon emissions (I)

360. SPETH, *supra* note 211, at 4.

361. *Id.* at 4.

362. JACKSON, *supra* note 351, at 102.

363. *Id.* at 102.

364. Fournier, *supra* note 276, at 530.

365. JACKSON, *supra* note 351, at 53-54.

366. *Id.*

367. See Paul Ehrlich & John Holdren, *Impact of Population Growth*, 171 SCI. 1212 (1971). Where I = environmental impact, P = population, A = affluence or economic growth, and T = technological intensity of economic output. Relative decoupling requires that the T factor be decreasing relative to A (the main focus of ecological modernization) while absolute decoupling requires that the I factor be going down as well. The IPAT formula was developed forty years ago by Paul Ehrlich and John Holdren.

368. See United Nations Dep't of Econ. & Soc. Affairs, Population Div., *World Population Prospects: The 2008 Revision*, U.N. Doc. ESA/P/WP.210, *available at* http://www.un.org/esa/population/publications/wpp2008/wpp2008_highlights.pdf (this population growth rate is based on the UN's mid-range estimate for world population which projects a total of 9 billion people by 2050).

could then be expected to grow at about the same rate as the average global annual income (A) which is projected at 1.4% a year.³⁶⁹ At this rate, by the year 2050, carbon emissions would have increased to 80% over current levels.³⁷⁰ In order to reduce carbon emissions by 4.9% per year, technology would need to improve by 7% *per year or nearly 10 times current levels*.³⁷¹

This situation points to a major contradiction for economic growth. If one were to assume continued economic growth of even just 2% per year (well below the macro-economic optimum of 3%) from 2050 to the end of the century, then “to all intents and purposes, nothing less than a complete decarbonisation of every single dollar will do to achieve carbon targets.”³⁷² That is, instead of the “relative decoupling” that allows for reduced energy use for every unit of growth, what is needed is “absolute decoupling” that allows for energy use to decline overall even as growth continues. This is especially necessary if, as many scientists state, the necessary level of carbon in the atmosphere should be 350 not 450 ppm. For Jackson the conclusion is inescapable:

[S]implistic assumptions that capitalism’s propensity for efficiency will allow us to stabilize the climate or protect against resource scarcity are nothing short of delusional. Those who promote decoupling as an escape route from the dilemma of

369. See JACKSON, *supra* note 351, at 53. This is based on the average increase in per capita income (in real terms) since 1990.

370. *Id.* at 54.

371. *Id.* This would mean that by 2050 there would need to be a 21-fold improvement in the current average carbon content of economic output. Keep in mind that this is to reach a target of 450 ppm which many would consider far too high to stabilize the climate.

372. *Id.* at 56. If population growth decreases, it will relieve some of the pressure on technology improvement. Conversely, population could increase even more and hit the UN’s high range forecast of 11 billion people by 2050. However, with approximately 20% of the world’s population consuming 80% of the its resources, lowering the consumption of the affluent 20% combined with truly equitable global redistribution would be vastly more efficacious. As greater social equity decreases the need for, and pressure on economic growth while inequity drives economic growth through the rising tide principle, the latter is a more “rational” economic policy.

growth need to take a closer look at the historical evidence – and at the basic arithmetic of growth.³⁷³

This conclusion poses a direct challenge to the ideology that underpins today's environmental law, ecological modernization, the central premise of which is the ability to harmonize economic and environmental objectives through enhanced efficiency.

Breaking free of the economic imagery of capitalism is clearly not easy, and even those who challenge the economics of growth often still do so within the bounds of a capitalism that they see as capable of being reshaped if not by visionary corporate leaders then by progressive state-based legal reforms.³⁷⁴ Indeed, most of the proponents of the “heterodox” field of ecological economics that was founded on the limits of growth explicitly eschew a challenge to capitalism. Under the influence of neoliberalism, they have increasingly adopted the discourse and strategies of mainstream neoclassical economics (e.g. pricing ecosystem services).³⁷⁵ Even the burgeoning “degrowth” movement that specifically targets exponential growth and growth-based solutions to environmental degradation does so within careful bounds. A strategic explanation of this situation comes from one of degrowth's primary exponents who suggests that the concept of degrowth is really “a conceptual or ideological weapon . . . that fosters a spirit of critique.”³⁷⁶ Serge Latouche argues that society

373. *Id.* at 57.

374. *Id.* Jackson's critical report falls prey to this. His proposed “policies” and reforms include sharing available work, strengthening the planning capacity of local communities, creating and protecting public spaces, increasing taxation on high earners, instituting a Tobin tax on international financial transactions, improving access to quality education, and banning advertising to children. Jackson acknowledges that such a transition would require fundamental changes to underlying structure, but contends that such changes are possible through government action.

375. See Anderson & M'Gonigle, *supra* note 246 (discussing how this situation has been manifested).

376. Fournier, *supra* note 276, at 532; see also LATOUCHE, *supra* note 319 (providing a review and analysis of the concept of degrowth and explores how it can be implemented at various levels. Latouche argues that degrowth is the “only political project capable of renewing the left” as it provides a “radical critique of consumption and of development . . . *ipso facto* a critique of capitalism.”); see also Serge Latouche, *Can the Left Escape Economism?*, 23

is so locked into the paradigm of growth that “imaginative thinking outside the box is impossible.”³⁷⁷ This requires us, first and foremost, to “decolonize” our imaginations. Degrowth’s emphasis, therefore, is not so much on policy as it is on creating “a political alternative that seeks a popular mandate for radical changes.”³⁷⁸ Recognizing the impossibility of implementing degrowth under the current configuration of power, it appeals in the first instance not to powerful politicians but to a new cultural narrative that can lead to the development of autonomous spaces, both intellectually and physically, for social interaction, production, and experimentation.³⁷⁹

C. Lessons from State Practice: Carbon Democracy

If it is difficult for environmental lawyers (and anyone for that matter) to break out of the economic imaginary that infuses the theoretical underpinning of environmental law (ecological modernization), it is well nigh impossible for us to break out of the political imaginary that infuses its practical possibilities (the state). This form of political organization has so colonized our political (and “regulatory”) visions as to become “naturalized.” The state is all that there is, and all that is possible to be. And so, writes Tim Jackson: “The state is society’s commitment device par excellence, and the principal agent in protecting our shared prosperity.”³⁸⁰ He argues that by shifting the macro-economy

CAPITALISM, NATURE, SOCIALISM 74, 75 (2012). The limited degrowth critique is a telling manifestation of “discourse hegemony.”

377. Serge Latouche, *Why Less Should be So Much More: Degrowth Economics*, LE MONDE DIPLOMATIQUE – ENGLISH EDITION (Nov. 14, 2004), <http://mondediplo.com/2004/11/14latouche>.

378. Kallis, *supra* note 320, at 878.

379. *Id.* This is in line with David Korten’s model of revolutionary change where new cultural narratives are cultivated that “nurture a culture of partnership, redefine prosperity and security, affirm the possibilities of the higher orders of human consciousness” In contrast to imperial narratives and the culture of domination it nurtures, these “earth community stories” open up new cultural spaces to experiment with relations of partnership and cooperation essential for creating a new era; see DAVID KORTEN, *THE GREAT TURNING: FROM EMPIRE TO EARTH COMMUNITY* 302-12 (2006).

380. JACKSON, *supra* note 351, at 11. The proposed changes would require unprecedented levels of state regulation and involvement in running the economy and significant reductions in business activity.

away from the structural requirements of growth, the state will be freed to “play its proper role” and protect the long-term interests of society and ecology. Others, such as the environmental theorist, Robyn Eckersley, concur. In *The Green State*, Eckersley calls for a dramatic environmental turn by the state: “There are still few social institutions that can match the same degree of capacity and potential legitimacy that states have to redirect societies and economics along more ecologically sustainable lines.”³⁸¹ Furthermore, the state’s role as “final adjudicator and guarantor of positive law” puts it in the most powerful position to discipline market actors and consumers, as well as to redistribute resources.³⁸² Eckersley and, indeed, almost everyone concerned for such a conversion agree that “the key . . . lies in deepening the democratic accountability and responsiveness of states to their citizens’ environmental concerns while also extending democratic accountability to the environmental concerns of transnational civil society, intergovernmental organizations and the society of states in general.”³⁸³

As we have seen in our initial review of diverse resource regimes, the contradictions of capitalism have long molded the shape of governmental policies and laws to accommodate the state’s own dependence on the growth generated by these regimes. As governments became the macro-managers of the economy over the past century, this dependence deepened particularly as economic crises were transformed into political crises for which governments were held responsible. As a result, like environmental lawyers, governments have become not more but less empowered to engineer an environmental conversion. This is why we must now look beyond “legal laws” to consider the higher level, law-like dynamics of systems and institutions that are both authoritative (i.e. regulatory in effect) and socially constitutive (i.e. determinative of our material and cultural character). What more binding social law could there be today than that of the imperative of economic growth? And was such a

381. ECKERSLEY, *supra* note 231, at 7.

382. *Id.* at 12.

383. *Id.* at 15.

social law not “created” by society such that it could/should be capable of social “re-form” (i.e. systemic reformation)? Undoubtedly, the most common panacea for what ails the modern world—a dramatically invigorated democracy—must be at the center of an eco-conversion, but one must query what sort of a reformed democracy it might take, within what sorts of new economic contexts, with what new forms of cultural and discursive institutions, and what sorts of knowledges and social processes to support them? And how to achieve (to “constitute”) these? To interrogate what we now have, and what new forms might be necessary, is a primary contribution for a future GLT that takes us beyond the limits of environmental legal analysis as we have come to know it. For example, with serious constitutional amendments,³⁸⁴ Eckersley argues that her “green state” would act as a radical extension of liberal democracy rather than a radical departure from it.³⁸⁵ She describes her proposals as embracing a new “reflexive modernization” that is similar to widely discussed proposed new forms of legal rights for nature, constitutional rights to a clean environment, public trust doctrines, and new procedural obligations. But, as we have seen, all these proposals would, if effective, inherently pose a common threat to growth, to capitalism and, inevitably to the liberal state itself. This prospect undermines the proponents’ claims of adopting a “realistic” strategy that implicitly fits within the liberal mold, in comparison with more “radical” and unrealistic proposals that challenge this tradition and its associated

384. Eckersley’s central proposal is to create a green constitutional framework which has as its central reform the constitutional entrenchment of the precautionary principle. A green constitution would also include such things as a commitment to protect biodiversity and the earth’s integrity, environmental rights for citizens, rights to negotiate environmental standards, and rights to information regarding risk-generating proposals. The precautionary principle would, she argues, be the single most effective means for controlling the adverse impacts to future generations, non-citizens, and the non-human world; *see id.* at 135-36, 243; *see also* BOYD, *supra* note 222 (discussing similar hopes on a constitutional right to a healthy environment. Others similarly speak of “earth rights” and “ecosystem rights.”); *see generally* EARTH LAW CENTER, <http://earthlawcenter.org/about/> (last visited Feb. 27, 2013). This discussion is reminiscent of the longstanding critique of “rights discourse” that is well rehearsed in other areas of critical (feminist, race) legal theory.

385. ECKERSLEY, *supra* note 231, at 137. Eckersley characterizes it as “post-liberal” rather than anti-liberal.

institutional embodiments. This naturalization of the state is but another historical trend that accompanies the historical “loss of innocence marked by a step back from an anarchist rejection of the state.”³⁸⁶

But recall that the translation of the rise of the state into liberal democracy derives from two related traditions: economic liberalism and liberal democracy. As Chantal Mouffe notes, “[t]here was no necessary relation between those two distinct traditions but only a contingent historical articulation.”³⁸⁷ The central value of economic liberalism is individual autonomy; under capitalism, economic inequality is unavoidable insofar as only a small minority owns productive capital and the majority are required to labor for others. At the same time, the capitalist system allows for superior productivity and thus the possibility for mobility. By contrast, the original meaning of democracy is “rule by the common people” where the lowest and largest class holds greatest sway.³⁸⁸ In its modern incarnation, it has as its core principles state sovereignty and political equality, the former freighted with particularly suspect historical baggage.³⁸⁹ The renowned political theorist, C.B. Macpherson noted that, until about 150 years ago, democracy was feared by “everybody who was anybody” since, as he put it, they “knew that democracy, in its original sense of rule by the people or government in accordance with the will of the bulk of the people, would be a bad thing—fatal to individual freedom and to all the graces of civilized

386. MATHEW PATERSON ET AL., *GREEN THEORY IN THE STATE: THEORIES AND ISSUES* 135, 135 (Colin Hay et al. eds., 2006). The environmental political philosopher, Mick Smith, similarly criticizes Eckersley’s green state on the basis that state sovereignty is “by no means as flexible as Eckersley suggests” and, on the contrary, when “it deems its own security is threatened” will be the vehicle by which “states of emergency and antipolitical technocratic solutions” will be exercised; MICK SMITH, *AGAINST ECOLOGICAL SOVEREIGNTY: ETHICS, BIOPOLITICS AND SAVING THE NATURAL WORLD* 201 (2011).

387. CHANTAL MOUFFE, *THE DEMOCRATIC PARADOX* 3 (2000).

388. C.B. MACPHERSON, *THE REAL WORLD OF DEMOCRACY* 5 (1965).

389. See KARENA SHAW, *POLITICAL THEORY AND INDIGENEITY: SOVEREIGNTY AND THE LIMITS OF THE POLITICAL* (2008); SMITH, *supra* note 386. Both authors address sovereignty as a cultural/philosophical construct, a practical effect of which was to define, exclude, and control the non-human “other,” in Shaw’s case, Indigenous peoples and, in Smith’s case, nature.

living.”³⁹⁰ Consequently, the merging within “liberal democracy” of the very different logics of economic and political liberalism resulted in contradictions and tensions arising from democracy’s commitment to socio-political equality, and economic liberalism’s tendency to create immense economic inequality.³⁹¹

So-called “liberal” markets were in place nearly two centuries before the advent of representative democracy, and this form of governance developed only on the prior foundation of the values generated by these markets.³⁹² More particularly, the open democracies in which most Westerners live today developed on the basis of the almost boundless wealth generated by the rise and expansion of industrial capitalism, wealth that could satisfy the worker as it also enriched the capitalist. All of the accoutrements of modernity (below in italics) were only made possible with the development of dense energies, first coal and then oil—*industry* with its new *machinery* and vast *labor force* that was centered in the swelling *manufacturing cities* and drew on a globe-spanning *transportation network* that carried incoming *raw commodities* and outgoing *produced goods*. In turn, this productivity machine was directed to process a vast storehouse of non-fuel resources—forests, fish, rivers, geological landscapes—into the *commodities* of lumber, food, and ore that is the stuff of wealth. Only with this physical deluge of natural wealth was democracy itself transformed from a threat to the liberal state and market capitalism into a stabilizing force that could now

390. MACPHERSON, *supra* note 388, at 1. As conservatives during the English civil war argued, there were five times more people without landed property than those with. Thus, “if the master and servant shall be equal electors . . . the majority may by law . . . [enact] an equality of goods and estate” and result in chaos; Hanna Pitkin, *Representation and Democracy: Uneasy Alliance*, 27 SCANDINAVIAN POL. STUD. 335, 339 (2004) (quoting A.S.P. Woodhouse 1951). In the U.S., James Madison argued in *The Federalist Paper #10* that “pure democracies . . . have ever been spectacles of turbulence and contention: have ever been found incompatible with personal security or the rights of property; and have in general been as short in their lives as they have been violent in their deaths.” James Madison, *Federalist No. 10* ¶13 (1787), available at <http://www.foundingfathers.info/federalistpapers/fedindex.htm> (last visited May 22, 2012).

391. MACPHERSON, *supra* note 388, at 7; ROBERT DAHL, ON DEMOCRACY (1998); see also HELD, *supra* note 230.

392. MACPHERSON, *supra* note 388, at 6.

reward the masses who were willing to “take their fully and fairly competitive place within those institutions and that system of society.”³⁹³ Thus does liberal democracy rest on a very specific historical foundation, with particular on-going needs and expectations that cannot merely be assumed.

To maintain this stability, the liberal democratic state necessarily became the central defender and developer of capitalism. The flows of energy and nature-based commodities that it demands are essential for the development of current forms of political and economic life ranging from new forms of urbanization and governance to modern modes of eating, building, working, moving, playing—in short, the whole of modern life, including the global financial order upon which the post-war West has developed. Ours is literally a “fossil fuel mode of governance,” that is, a “carbon democracy.”³⁹⁴ This whole package underpins the idea of an economy that can be both sustainable and inequitable as long as it can keep growing. Thus, while fossil energy made possible the huge increases in economic production and growth, it also shaped the boundaries and expectations of the modern social and political imagination.

If abundant supplies of energy have provided liberal democracies with seemingly limitless growth, material abundance, global financial order, and the emergence of democratic politics, the passing of the era of dense fuels (whether from exploitable limits in supply or environmental costs in their use³⁹⁵) portend an uncertain future for liberal democracies that

393. *Id.* at 11. While those who gained the vote demanded various services from the state such as education, health and welfare, and regulation of the economy, Macpherson argues the state would have eventually had to provide these things regardless of democratic franchise. Social services, he notes, are necessary in order to quell social unrest and ensure the stability of the state, while regulation of the economy, as the great depression of the 1930s showed, is required to keep the economy operating.

394. See Matthew T. Huber, *Energizing Historical Materialism: Fossil Fuels, Space and the Capitalist Mode of Production*, 40 *GEOFORUM* 105 (2008) (discussing an analysis of the “fossil fuel mode of production”); see also Timothy Mitchell, *Carbon Democracy*, 38 *ECON. & SOC’Y* 399 (2009).

395. See James Murray & David King, *Climate Policy: Oil’s Tipping Point has Passed*, 481 *NATURE* 433 (2012) (arguing that the wild fluctuations in fuel prices that has led (currently and historically) to economic crises, is more likely to motivate a move away from fossil fuels than limited supply or climate change).

are unable to move beyond the capitalist metabolism from which they have emerged and have since become dependent upon. With ecological scarcity, can the liberal state respond in a way that preserves both its liberal and democratic character? History does not give cause for optimism, including the recent history of neoliberalism which, through a so-called “new constitutionalism” of global institutions such as the WTO and on-going free trade regimes, moved economic management beyond the reach of democratic politics.³⁹⁶ As access to resources and the continued operation of the “free” market inevitably comes under increasing pressure, and with modern societies so highly leveraged (both economically and environmentally), normal economic cycles of expansion and contraction (recession) become real threats to system stability. This does not bode well for calls to expand democracy, green the state, de-grow the economy, or even merely to maintain those constraining forces (such as environmental law and social welfare regimes) that arose in periods of more robust growth.

Here again, this assessment demands that “legal” understandings reach beyond assumed philosophical premises, long established institutional arrangements, and pre-existing power relations that underpin our liberal order. Leading political theorist, James O’Connor, suggested years ago that environmentalism itself was essentially “sub-theoretical”³⁹⁷ because it took on the tenets of liberal economics and democracy in a naturalized manner that is almost Fukuyamian in character.³⁹⁸ From its birth in the 1960s to the present day, the

396. On the constitutive rule-making of this “new constitutionalism” (also called a new “constitutionalism beyond the state”); see ISABELLA BAKKER & RACHEL SILVEY, *BEYOND STATES AND MARKETS: CHALLENGES OF SOCIAL REPRODUCTION* (2008); DAVID SCHNEIDERMAN, *CONSTITUTIONALIZING ECONOMIC GLOBALIZATION: INVESTMENT RULES AND DEMOCRACY’S PROMISE* (2008).

397. James O’Connor, *Capitalism, Nature, Socialism: A Theoretical Introduction*, 1 *CAPITALISM, NATURE, SOCIALISM* 11 (1988). O’Connor notes that in failing to comprehend the dynamics of capitalism, the legal successes of environmental lawyers in the U.S. in the 1970s and 1980s resulted in the migration of polluting industries to the global south where associated environmental damage has been more severe, both locally and globally.

398. FRANCIS FUKUYAMA, *THE END OF HISTORY AND THE LAST MAN* (1992). We refer here to Fukuyama’s highly touted, but controversial book, and its thesis that liberal democracy marks the final triumph of a single mode of thought and

panoply of laws, regulations, policies, and guidelines that fall under the general rubric of environmental law and policy remains rooted in, and propels forward, the “modernist project.” Its assumptions pervade environmental law: that (neutral) science can provide the knowledge to control environmental problems, and technology can provide the means; that markets can “internalize” externalities, and governments can act to make sure that they do if only they have “political will;” that progress is still possible under conditions and thinking inherited from an age long passed. All we really need is to do what is rational. According to English legal theorists Sean Coyle and Karen Morrow:

The question of the ‘philosophical foundations’ of environmental thinking in law may strike the lawyer, as well as the legal philosopher, as a strange one. For while a search for the philosophical commitments of environmental thinking undoubtedly makes sense in the context of ethics, or political theory, environmental *law* (it might be felt) lacks any such philosophical underpinning [T]here is not (on this view) to be found any deeper rationale or overarching principle beyond this purely instrumental concern with human wellbeing.³⁹⁹

This situation for environmental law contrasts with the Critical Legal Studies (CLS) movement that, beginning in the 1970s, propelled a transformation in legal theory beyond the narrow confines of the old jurisprudence. Environmental law has been absent from this movement because it is embedded within the dominant liberal paradigm and has nothing to offer it.⁴⁰⁰ Yet

social organization that will put past ideological battles to an end. His thesis was widely attacked as another in series of failed end-of-history promises especially as it was quickly displaced by an on-the-contrary “clash of civilizations” thesis that actually seemed to be playing out. Nevertheless, the continued dominance—indeed, the pervasive “naturalization”—of capitalist ideology and state management suggests that the Fukuyamian thesis of but-one-way-forward does in fact prevail (and, in a strange contradiction, actually helped to generate and sustain the clash of civilizations).

399. SEAN COYLE & KAREN MORROW, *THE PHILOSOPHICAL FOUNDATIONS OF ENVIRONMENTAL LAW: PROPERTY, RIGHTS AND NATURE* 1 (2004).

400. Supportive evidence for this assertion can be found in the texts accompanying the long history of critical legal studies (CLS), and its evolution into a diversity of theorizing—from feminist legal theory to postmodernism and the law—where environmental law is scarcely to be found; *see generally* GARY MINDA, *POSTMODERN LEGAL MOVEMENTS: LAW AND JURISPRUDENCE AT CENTURY’S*

its absence is bizarre on both sides as the exploitation of the environment with which environmental law is concerned props up the unjust modernism with which critical theory is concerned. While CLS flourished, however, environmental law took root as a reformist project that avoided the critical concerns of “race, class, and gender” and the postmodern insights of late twentieth social thinking and practice. As a result, the Left largely dismissed it as a bourgeois field concerned primarily with middle class quality-of-life concerns. This failure to engage from either the inside or outside of the field has left environmental law impoverished. Despite its countless challenges to particular economic and political developments, it remains bereft of a larger critical theoretical base, and thus absent the ability to be self-reflective. At the same time, the Left has still only partially embraced the values of “nature.” It is time for this to change on all sides.

VII. CONCLUSION: TOWARD A GREEN LEGAL THEORY

Two days after delivering his 2012 State of the Union address, President Obama hit the campaign trail with a central message: the need to expand domestic oil production. Speaking at a fuelling depot for UPS air parcel transport planes in Colorado (a metaphor for modernism if ever there was one), Obama exhorted: “We need an all-out, all-in, all-of-the-above strategy that develops every source of American energy.”⁴⁰¹ This includes expanded production in the Gulf of Mexico and “fracking,” as well as new sources that are “cleaner and cheaper and full of new jobs.”

The same day, on the other side of the Atlantic, Canadian Prime Minister Stephen Harper addressed the World Economic Forum. At home, Harper was in the midst of a media storm after he labeled environmentalists as “radicals” who were enemies of Canada for their opposition to a proposed pipeline to carry Tar

END (1995); REZA BANAKAR & MAX TRAVERS, AN INTRODUCTION TO LAW AND SOCIAL THEORY (2002) (an example of its absence).

401. Shawn McCarthy, *Obama Touts Domestic Oil, Gas*, GLOBE & MAIL, Jan. 27, 2012, at A8.

Sands bitumen through the mountains to ports on the West Coast for export to Asia.⁴⁰² In Davos, the Prime Minister outlined a “grand plan” for his next five years that included enhanced energy exports and the need to reduce “regulatory delays for mining and energy projects.”⁴⁰³ On that same day, on the front page of the Business section of the national newspaper, a federal document was leaked where environmental organizations and aboriginal groups were described as “adversaries” while industry associations, energy companies, and the National Energy Board—which is supposed to serve as an independent government agency evaluating new proposals—are listed as “allies.”⁴⁰⁴ Meanwhile, the federal *environment* minister was reported to have addressed the Calgary Chamber of Commerce, an “audience packed with some of the top oil patch executives,” where he stated that “Environment Canada is a strategic partner to everyone in this room I’m not here to kill your buzz.”⁴⁰⁵ His message was to streamline the regulatory process to avoid blockages to hydrocarbon development.⁴⁰⁶

This paper has analyzed the common frame that bounds these two political leaders despite their positions at seeming opposing ends of the ideological spectrum: a frame where the sustainability ideals of state-based environmental law blends with the material dynamics of the state to produce the central, and seemingly irresolvable, contradiction of modernity. We have attempted to understand this contradiction by considering how it:

- has historically shaped the structural character of various resource sectors;
- has produced patterns of development and environmental impacts that reflect commonalities across these sectors;

402. David Ebner, *Oil-Sands Pipeline Hits its Highest Hurdle*, GLOBE & MAIL, Jan. 9, 2012, at P. A1

403. Joe Friesen & Bill Curry, *Harper’s Grand Plan*, GLOBE & MAIL, Jan. 27, 2012, at A1.

404. *Federal Documents Spark Outcry by Oil Sands Critics*, GLOBE & MAIL, Jan. 27, 2012, at B1.

405. *Id.*

406. *Id.*

- continues to embody a liberal economic and political rationality that, today as in the past, limits the conditions of future possibility;
- inherently defines “green” initiatives so that they support continued economic growth and capital accumulation while excluding consideration of systemic alternatives, and;
- effectively defines environmental law to function as an incremental instrument of reform within bounded parameters that themselves undermine the efficacy of reform.

In summary, GLT is based on the premise of “legal laws” as not the true (or at least not the most important) sources of social regulation because they are themselves products of “higher” level systems, the needs and dynamics of which provide the truly authoritative momentum and direction of social evolution. Thus, the hope for effective regulatory “re-formation” demands a diverse set of new understandings about, and approaches to, the dynamics of constitutive material and cultural forces—from the internal needs of capital, to the spatial compulsions of the state, to the hegemonic effects of dominant discourses. The need is, in several ways, for a new theoretically-based critique and theoretically-informed understanding of “law” itself.

First, a new critical theory could fill the void that exists in environmental law, contribute to a broader range of legal theory, and open up new transformative possibilities.⁴⁰⁷ We have addressed how the philosophical and ideological origins of the liberal democratic state (its *ideal* foundations) continues to frame legal thought while its *material* base in the natural world provides an essential but minimally theorized context for virtually all aspects of modern law. The very act of creating the specialist field of environmental law itself tended to segment consideration of this reality rather than seeing nature’s presence/absence across the range of the legal system. In response, *green legal theory* is needed for environmentalists and

407. It is beyond the scope of this paper to consider in systematic detail its character. This is discussed more fully in M’Gonigle, *EARTH RULES: ON THE NATURAL LAW, BEHIND THE SOCIAL LAWS, THAT HOLDS US TO ACCOUNT*, *supra* note 24.

environmental lawyers while the *greening* of *legal theory* is necessary more generally.⁴⁰⁸

Second, GLT opens up to environmental legal scholars the analysis of *constitutive* social systems and dynamics that exist *as law* even though they exist above or behind the “legal law” as it has been narrowly conceived, and beyond the legal preoccupation with the rule of rules. This dominating conception has been much challenged in recent decades with, for example, Michel Foucault’s concept of the self-disciplinary character and micro reach of “governmentality” (as compared to the more explicit sanctioning quality of central government enforcement). It is also evident in the rise of legal pluralism that recognizes how laws are created by non-state actors, from organized religions to indigenous communities to the family. GLT takes this expansion further by looking at the effectively legal (i.e. socially structuring) impacts inherent in the dynamics of meta-systems such as capitalism and the sovereign state. Understanding these dynamics in this regulative way offers important, and timely, work for the GLT scholar.⁴⁰⁹

Third, and following from the broader insights of the “cultural turn” of which Foucault was a signal contributor, GLT is not about legal reform. This is perhaps its most difficult challenge to the environmental lawyer. To understand why this must be so, consider the invocation of Paul Kahn in *The Cultural*

408. It might be noted that this double bind contributes mightily to their having been no paradigm revolution in environmental law with environmental lawyers not being critical theorists, and vice versa.

409. The range of this examination necessarily reaches to the very foundations of modern legal positivism. Although based in a strongly materialist critique, it is at this intersection with the nature and limits of positivism that GLT engages with the more “idealist” (that is philosophical) basis of “wild law” and its “earth jurisprudence.” See CORMAC CULLINAN, *WILD LAW: A MANIFESTO FOR EARTH JUSTICE* (2d ed. 2011); see also Judith Koons, *Earth Jurisprudence: The Moral Value of Nature*, 25 PACE ENVTL. L. REV. 263 (2008). The limits of a philosophically-based green jurisprudence can be seen in Koons’ espousal of morally-based reforms to corporate practices. *Id.* at 325. Despite the much greater situatedness of GLT in a critical political economy, wild law and GLT share a prospective concern to develop a post-positivist “naturalism.” See R. Michael M’Gonigle, *A New Naturalism: Is There a (Radical) ‘Truth’ beyond the (Postmodern) Abyss?*, 8 ECOTHEOLOGY 8 (2000).

Study of Law that a “new discipline of legal study must abandon the project of reform.” He states:

We cannot trust our conclusions if we are writing for an audience to which we have ceded a power over our own personal interests. We cannot study law if we are already committed to law. We cannot grasp the law as an object of study if the conceptual tools we bring to the inquiry are nothing but the self-replication of legal practice itself

A new discipline of law needs to conceive its object of study and its own relationship to that object in a way that does not, at the same moment, commit the scholar to those practices constitutive of the legal order Understanding the constructed character of the rule of law allows us to see its contingent character and to understand that law’s claim upon us is not a product of law’s truth but of our own imagination—our imagining its meanings and our failure to imagine alternatives.⁴¹⁰

This turning away from reform seemingly makes no sense—and yet is obvious. On the one hand, no theorist concerned with the economy/environment contradiction would want to eschew issue-specific reforms where important natural amenities are threatened. On the other hand, to seek systemic reforms (like challenging growth) is “deemed to be the act of lunatics, idealists and revolutionaries.”⁴¹¹ Instead, what reforms are permitted increasingly only reinforce the contradictions that pervade their implementation. Under a vigorous neoliberalism, problems are to be “resolved” not through the old battles of a Left/Right dissensus over possible futures, but through the embrace of a “post politics” that seeks a managerial consensus where the fundamental conflict in values and vision is no longer seen as necessary, or tolerable.⁴¹² And so environmental lawyers now embrace what

410. PAUL KAHN, *THE CULTURAL STUDY OF LAW: RECONSTRUCTING LEGAL SCHOLARSHIP* 27, 39 (1999).

411. JACKSON, *supra* note 351, at 102.

412. This loss of the benefits of politics-as-dissensus is most notably associated with the work of the French political theorist, Jacques Ranciere. See Erik Swyngedouw, *The Antinomies of the Postpolitical City: In Search of a Democratic Politics of Environmental Production*, 33 *INT. J. URB. & REGIONAL RES.* 601 (2009) (discussing this in the context of urban environmental politics).

they once decried—green growth, corporate self-regulation, market-based solutions—as the “realistic” way forward in the era of neoliberal closure.

Ironically, the promise of theory is to help activists break out of this self-imposed box of ineffective practice. As the English literary theorist, Terry Eagleton, explained it, the value of theory is akin to that offered by a new person who quietly enters a room through a hidden passage and encounters a group of people arguing about how to find a way out. After listening for a while, “it occurs to her that though some of the talk is indeed constructive, much of it is more of a symptom of the situation than a strategic response to it.”

What she needs to do is fashion a form of discursive intervention which will somehow succeed in illuminating the relation between the talk and the situation; she must find some ‘meta-discourse’ . . . which will persuade her trapped fellows to grasp their talk as bound up with their material conditions rather than simply as a potential solution to them In this situation, the new individual is the theorist, and the ones already in the room are the ideologues.⁴¹³

The theorist here is thus not some irrelevant interloper, some high-minded abstractionist but maybe the most practical one in the place. After all, the task is still the same—to get out of the room by discovering its trap. So it must be with environmental law *and* GLT. But first, as they say, we must change the conversation.

Of course, a still skeptical reader might ask what any of this grand speculation has to do with the real world of environmental law where new coal mines are being opened every day, carbon concentrations keep increasing in the atmosphere, species keep going extinct—and we must act to challenge these now! Despite the depth of the present critique, the development of a green legal theory toward which this critique points ultimately is not directed to a rejection of environmental law but its transformation within a larger framework of theoretical understanding and strategic action. As we have acknowledged from the start, GLT is certainly

413. TERRY EAGLETON, *THE SIGNIFICANCE OF THEORY* 36-37 (1990).

not seeking to replace the role of environmental law *as resistance*, although it would definitely question its role *as reformer*. Given a new understanding of the limitations of environmental law's capacity for prospective action, a corollary need exists to open a new, critical, and theoretically-informed landscape beyond intra-systemic "reform" and toward larger "re-forms." Still addressing the real world of the present but opening up the discourse, GLT should help to unveil a "new narrative" of our past, a more informed context for environmental action in our present, new imaginaries of possible futures and, above all, new strategies for getting there. In the process, the *practice* of environmental law would evolve into a *praxis*, that is, a practice that is theoretically-informed and committed to manifesting where that theory leads.

Neither can this discussion be dismissed as environmental lawyers "being realistic" while green legal theorists engage in mere speculation. As we have argued, social practice without an explicit theoretical frame is blind, and easily leads to outcomes that contradict its own avowed goals as environmental law now does with its promulgation of carbon taxes, ecosystem pricing, green energy, and so on. Action without the right frame is akin to an American in London in a hurry to cross the road, looking left as he steps off the curb, not having taken the time to learn the new frame that demands that one must look in the other direction because cars there are on the "wrong" side of the road. The result is mission failure. At the same time, social theory without a practical commitment easily becomes detached and self-indulgent. Having said that, however, the yawning gap that exists in critical legal theory provides sufficient justification on its own for GLT in its general green(*ing*) function to address all aspects of the modern legal order, not just environmental law. GLT has immense practical value, for example, in helping to understand why democracy is necessarily imperiled and how we might begin to address new "constitutive" arrangements that could actively constitute new economic and political imaginaries.⁴¹⁴ At more immediate levels of action, it would

414. Without delving into a prospective green legal theoretical analysis here, one example of such an imaginary can be found in a recent article. Wes Nicholson, *Getting to Here: Bioregional Federalism*, 40 ENVTL. L. 713 (2010). As well, insofar as it is motivated by making the state accountable to a "natural

situate environmental reforms (for example, for the industrial sectors discussed in the opening pages of this article) within an agenda of the broader, post-industrial re-formation. In this task, it would also help identify principles not for legal law reform but for what might be seen as the re-formation of culturally constitutive logics. Merely by way of illustration, such principles might include: radical demand reduction (as compared with incremental eco-efficiency); displacement of capital dependence (as compared with capital growth); substantive project assessments (as compared with price-based assessments) and so on. As guiding principles for responding to climate change, their goal would not be to internalize or create new rights that legitimate the problematic context, but to re-form that context. Thus, green legal re-form would explicitly work not for energy efficiency for a new generation of hybrid cars but to escape the “social economy” of automobility.

In his recent book about climate change, Anthony Giddens complained that “we have no politics of climate change” because the politics being applied to this global threat remain rooted in a world now past, a world still stuck in a set of naturalized economic and political realities that lead people to believe that a deal to resolve climate change will “be reached as soon as the nations of the world see reason.”⁴¹⁵ Such a world would, of course, turn to environmental law to enshrine this reason—but this world is now past. If there is no politics, there is certainly no law of climate change, just a law of symptoms. This paper has begun to hint at the vast new conceptual, analytical, and practical spaces that need to be opened up, spaces that would allow environmental lawyers to make common cause with the wide new array of constituencies and knowledges pointing the way to the needed “legal” reformations. Humanity is at a turning point, but we fail to embrace its possibilities. Instead, in the well-worn phrase of American cultural theorist, Frederic Jameson, “it

law” order (i.e. where the state is seen as accountable beyond its own positivist constitution), Mary Wood’s application of the public trust doctrine has a green legal character. Wood, *supra* note 23. What is significant with both of these approaches, independent of the problem of implementation, is the new “constitutive” (and constitutional) context in which they situate the state.

415. ANTHONY GIDDENS, *THE POLITICS OF CLIMATE CHANGE* 4, 209 (2009).

is easier to imagine the end of the world than the end of capitalism.”⁴¹⁶ Like Giddens, Mitchell comments that “the democratic machineries that emerged to govern the age of carbon energy seem to be unable to address the processes that may end it.”⁴¹⁷ At the liberal limits of environmental law, the time is upon us to move beyond a bounded heritage so that we might let loose new imaginaries without which our shared goals will fade from the world.

416. Fredric Jameson, *Future City*, 21 NEW LEFT REV. 65, 76 (2003).

417. Mitchell, *supra* note 394, at 399.