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Statement of Purpose

The purpose of the *Texas Environmental Law Journal* is to provide members of the Environmental and Natural Resources Law Section of the State Bar of Texas and the public with legal articles and recent development columns on relevant environmental and natural resources law issues. The *Journal* also provides news of Section activities and other events pertaining to this area of law. The *Journal* is the leading source for articles on Texas environmental and natural resources law.

Joint Publication

The *Texas Environmental Law Journal* is an official publication of the Environmental and Natural Resources Law Section of the State Bar of Texas and is published jointly with the University of Texas School of Law's *Texas Environmental Law Journal*. In 1990, the Environmental and Natural Resources Law Section reached an agreement with this student organization at the University of Texas School of Law to co-produce the *Journal* as the *Texas Environmental Law Journal*. The students' involvement began with the summer issue in 1990.

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Journal Announcements

With Volume 39, the *Journal* changed from a quarterly publication to a triannual publication (Fall, Winter, and Spring & Summer). Also, the *Journal* is no longer carrying the "Changes in the Environment" section. Those announcements can be found on the Section's website at www.texenrls.org.

Letter from the Editors

Dear Readers,

In this issue's first Lead Article, "Gone to Texas: Concentrated Animal Feeding Operations and the Need for Compliance History Review of Out-of-State Applicants," **Christopher R. Brown** and **Blake Farrar** help us understand how Texas administers its compliance history rules related to concentrated animal feeding operations (CAFOs). The article also considers CAFOs nationwide and addresses the environmental problems they cause. It then explains federal CAFO laws and regulations under the CWA. Finally, Mr. Brown and Mr. Farrar evaluate Texas law and TCEQ rules, analyzing TCEQ's practice of establishing a procedure for monitoring compliance. The authors ultimately posit the following fundamental question: would an effective compliance history system help "restore and maintain the chemical, physical, and biological integrity of waters of the United States"? Despite uncertainties, this article answers that question affirmatively and advises that TCEQ restructure its rules and practices to create a better compliance history system.

In our second Lead Article, "Greening the Law of Advertising: Prospects and Problems," **Neil Gormley** explores whether advertising law should be enlisted in the effort to reconcile economic activity and environmental quality. In his article, Mr. Gormley first describes the links between advertising, consumption, and environmental harm and then identifies the contribution that improvements in the efficiency of retail markets can make to environmental sustainability. Next, Mr. Gormley discusses several possible reforms aimed at enhancing the informational content of advertising. This is followed with an evaluation of whether the potential reforms are consistent with the First Amendment's protection of commercial speech. Mr. Gormley concludes that several valuable regulatory approaches will be off-limits as long as courts persist in their zealous protection of commercial speech.

In the first of two Student Notes, "Finding Promise in Pond Scum: Algal Biofuels, Regulation, and the Potential for Environmental Problems," **Heather Hunziker** explores the potential benefits and risks of shifting biofuel production from currently popular crops, such as corn, to algae. Ms. Hunziker explains the technical advances in turning algae into fuel, which have been promoted by governments and taken advantage of in both the public and private sectors. These improvements are counterbalanced by public concern about genetically modified organisms escaping and contaminating their environment. This note evaluates how large-scale algae production would be regulated under current state and federal frameworks and offers suggestions for improving regulatory structures to mitigate risk.

In our second Student Note, "Overcoming the 'Energy Paradox' in the Built Environment," **George Padis** advocates for regulatory reforms that would encourage green building. Mr. Padis argues that because of the difficulties that arise from information asymmetries, market failures, and behavioral economics, the development of green building has not been as robust as expected. After exploring the

hurdles to the proliferation of green buildings, Mr. Padis argues how regulatory reform should address the "energy paradox" in the built environment. Specifically, Mr. Padis advocates for temporary government support through specific legal strategies to address these issues.

As a final note, we would like to extend our heartfelt appreciation and gratitude to Jimmy Alan Hall, who after nearly three decades of service to the Journal, has decided to retire from his post as Editor-in-Chief. To honor his contribution, we are pleased to announce in this issue of the *Journal* the creation of the annual Jimmy Alan Hall Student Note Award (see following page). The recipient of this award will be recognized at the *Journal*'s Spring banquet and a plaque with the recipients' names will be displayed at the Journal's student offices. Jimmy Alan has also graciously agreed to serve as Immediate-Past Editor-in-Chief for Volume 42, as he provides much-desired assistance in ensuring a smooth transition and training for this year's editorial board.

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Jimmy Alan Hall Award
for the Best Student Note

After twenty-eight years of dedicated work with the Texas Environmental Law Journal (TELJ), TELJ's long-time Editor-in-Chief, Mr. Jimmy Alan Hall, is retiring. Mr. Hall departs from his position at TELJ after overseeing the journal through its 41st Volume. In recognition of his contribution to TELJ, the students at TELJ are pleased to announce the establishment of the Jimmy Alan Hall Award.

As of the 2011-2012 school year, TELJ will honor the author of the best student note published in the current volume with this award. The Jimmy Alan Hall Award will be presented at the journal's annual banquet, held at the end of each school year.

Thank you, Mr. Hall, for your time and dedication to TELJ, which has given an invaluable educational opportunity to many law students interested in environmental law.

2011-2012 TELJ Editorial Board

Gone to Texas: Concentrated Animal Feeding Operations and the Need for Compliance History Review of Out-of-State Applicants

by Christopher R. Brown and Blake Farrar

I. Introduction and Overview

In the 2010–2011 Texas Sunset Advisory Commission evaluation of the programs that the Texas Commission on Environmental Quality (TCEQ) administers, the Sun-

set Report gave careful scrutiny to TCEQ's compliance history program.[1] In this context, compliance history refers to the practice of documenting a person's or facility's history of complying with environmental laws.[2] That past performance becomes a factor in the decision to issue a new permit to the facility, to renew its existing permit, to place stricter requirements in the renewed version of the permit, or to levy enhanced fines for repeat violations.[3] The Sunset Report made a number of recommendations with respect to compliance history, and TCEQ assented to all of them.[4] Several of the recommendations in the passed legislation include: removal of the statutory requirement for a uniform standard; removal of the statutory requirement to develop a compliance history classification for entities for which adequate compliance information is not available; and consideration of "positive" compliance factors and site complexity.[5]

TCEQ's approach to compliance history evaluation will likely change in the months and years to come. This article takes one of the myriad programs that TCEQ administers—the regulation of water pollution from concentrated animal feeding operations (CAFOs)—and examines the challenges encountered in administering the program. This article also examines how TCEQ may take this opportunity to respond to the new requirements of the legislation, to address these challenges, and provide for a more robust and effective permitting program.

Texans learn at an early age the story of American pioneers who, faced with economic ruin in their home states, migrated to the region of northern Mexico called Texas in 1819 and subsequent years. As eyewitnesses recounted, these pioneers signified their migration by marking their doors "GTT," or Gone to Texas.[6] The "Gone to Texas" story has been repeated in the regulatory context with regard to CAFOs. During a time when many factory farming corporations have consolidated into multistate operations with environmental compliance records all over the country, Texas considers applications from out-of-state factory farms on a blank slate. Once a factory farm operates in the state, the likelihood that it will lose its permit or suffer some other penalties for violating state water law or agency regulations is small. For out-of-state farms, as well as those already operating here, "Gone to Texas" is alive and well.

The term CAFO applies to approximately 238,000 facilities in the United States and denotes those with the largest number of livestock relative to other similar facilities.[7] The U.S. Environmental Protection Agency (EPA) defines CAFOs as "agricul-

1 2011 TEX. SUNSET COMM'N, SUNSET ADVISORY COMMISSION GUIDELINES: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY AND ON-SITE WASTEWATER TREATMENT RESEARCH COUNCIL 37–42 (Jan. 11, 2011), http://www.sunset.state.tx.us/82ndreports/tceq/tceq_dec.pdf.

2 *Frequently Asked Questions*, ENVTL PROT. AGENCY, http://www.epa-echo.gov/echo/ (last updated Oct. 11, 2011).

3 TEX. WATER CODE ANN. § 5.754 (West 2011).

4 2011 TEX. SUNSET COMM'N, *supra* note 1.

5 TEX. WATER CODE ANN. § 5.754(c) (West 2011).

6 *GTT–Handbook of Texas Online*, TEX. STATE HISTORICAL ASS'N. http://tshaonline.org/handbook/online/articles/pfg01 (last visited Nov. 19, 2011).

7 National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. 7176, 7179 (Feb. 12, 2003) (codified at 40 C.F.R. pts. 9, 122, 123 and 412) [hereinafter NPDES Guidelines].

ture enterprises where animals are kept and raised in confinement."[8] As the Second Circuit Court of Appeals noted in *Waterkeeper Alliance, Inc. v. EPA*, the largest-scale CAFOs "raise . . . staggering numbers of livestock—sometimes, raising literally millions of animals in one location. Economically, these CAFOs generate billions of dollars of revenue every year."[9]

When considering compliance history rules that inform water-quality permitting decisions with regard to CAFOs, one must keep in mind the fundamental objective of the federal Clean Water Act (CWA): to "restore and maintain the chemical, physical, and biological integrity of waters of the United States."[10] Without question, effective state regulation of factory farms plays an indispensable role in achieving this objective. At issue is the role the compliance histories of individual facilities and corporations play. The question is a serious one because CAFOs produce more than three times the solid waste of the entire human population of the United States and have discharged tens of millions of gallons of untreated wastewater into the nation's surface waters.[11]

To evaluate the manner in which Texas administers its compliance history rules with regard to CAFOs, this article first considers CAFOs nationwide, their consolidation into larger corporations and vertical integration with livestock producers, and briefly addresses the environmental problems they cause. Second, this article explains federal CAFO law and regulation under the CWA, the extent to which compliance history plays a role at the federal level, and the federal intent with regard to the role of compliance history in delegated state programs. Third, this article evaluates Texas law and TCEQ rules that establish a procedure for monitoring compliance. Fourth, the article evaluates actual TCEQ practice with regard to compliance history in response to a policy issue that is clearly national in scope. Finally, given the apparent shortcomings in the Texas compliance history system with respect to CAFOs, the following fundamental question is considered: would an effective compliance history system help "restore and maintain the chemical, physical, and biological integrity of waters of the United States"?[12] Despite uncertainties, this article answers that question affirmatively and advises that we restructure our rules and practices to create a better compliance history system.

II. CAFO Pollution

To understand the critical importance of monitoring the compliance history of CAFOs, one should first understand pollution generated by CAFOs. This section considers what pollutants animal wastes from CAFOs produce, how these pollutants enter water bodies, some of the ecological damages they produce, and why current trends in factory farming will likely produce greater quantities of water pollution in the future. Finally, this section considers a trend that requires a more effective interstate transfer

8 *Id.*

9 Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 493 (2d Cir. 2005).

10 Clean Water Act, 33 U.S.C. § 1251 (2011).

11 Doug Gurian-Sherman, *CAFOs Uncovered: The Untold Costs of Confined Animal Feeding Operations*, Union of Concerned Scientists 3–4 (April 2008), *available at* http://www.ucsusa.org/assets/documents/food_and_agriculture/cafos-uncovered-executive-summary.pdf.

12 Clean Water Act, 33 U.S.C. § 1251 (2011).

of information and evaluation of compliance history: the consolidation into regional, national, or international corporations by the entire factory farming industry. Corporations with extensive facilities out of state—many of which have negative compliance histories, as this article discusses in a subsequent section—have already applied for and obtained permits to operate CAFOs in Texas. Because the number of such applicants will likely increase in the future, the need to enforce compliance history rules will continue to grow in urgency.

A. CAFOs: A More Detailed Explanation

As this article already observed, agricultural operations produce an estimated 500 million tons of manure every year—three times the amount of waste the human population of the United States produces.[13] What distinguishes livestock waste from human waste is the manner of treatment: livestock waste is not treated, but placed in "lagoons" or in dry piles of litter and spread onto land.[14] EPA has focused on this industry because CAFOs generate millions of tons of manure every year, and "when improperly managed, [this manure] can pose substantial risks to the environment and public health."[15]

Water-quality issues pose challenges of a similar magnitude. EPA studies indicate that water pollutants from CAFOs include: (1) nutrients such as nitrogen and phosphorus; (2) organic matter; (3) solids, including the manure itself, and other elements mixed with it such as spilled feed, bedding, litter materials, hair, feathers and animal corpses; (4) pathogens (disease-causing bacteria and viruses); (5) salts; (6) trace elements such as arsenic; (7) antibiotics; and (8) pesticides and hormones.[16]

In 2000, EPA issued a comprehensive report that dealt in part with the ecological and health effects of waste released from CAFOs to surface water, groundwater, soil, and air.[17] The report documented a range of human health and ecological impacts, including the degradation of the nation's surface waters.[18] Such animal-waste discharges from CAFOs have also produced massive fish kills in locations throughout the United States.[19] Animal-waste contaminants also polluted drinking water sources, according to EPA's report.[20] EPA's National Water Quality Inventory report identified agriculture—including, but not limited to CAFOs—as the chief source of pollutants that impaired

13 NPDES Guidelines, *supra* note 7, at 7180.

14 Michele M. Merkel, *EPA and State Failures to Regulate CAFOs under Federal Environmental Laws* 1 (Sep. 11, 2006), *available at* http://www.environmentalintegrity.org/pdf/publications/EPA_State_Failures_Regulate_CAFO.pdf.

15 NPDES Guidelines, *supra* note 7.

16 ENVTL. PROT. AGENCY, RISK ASSESSMENT EVALUATIONS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS 24 (May 2004), *available at* http://www.epa.gov/nrmrl/pubs/600r04042/600r04042.pdf.

17 ENVTL. PROT. AGENCY, OFFICE OF WATER, EPA-841-R-02-001, NATIONAL WATER QUALITY INVENTORY: 2000 REPORT TO CONGRESS 1 (2002).

18 *Id.*

19 *Id.*

20 *Id.*

water quality in rivers and lakes.[21] Twenty-nine states reported that CAFOs contributed to water-quality impairment.[22]

Claudia Copeland, Environmental Specialist for the Congressional Record, describes how animal wastes from CAFOs are varied and can enter air, soil, and water through a number of conduits.[23] Copeland explains that animal-contaminated water can reach larger water bodies through a number of avenues: surface runoff and erosion, direct discharges to surface waters, spills, discharges, leaches into soil and groundwater, and volatilization of gases and odors to the atmosphere (including subsequent deposition back to land and surface waters).[24] Copeland notes that "[p]ollutants associated with animal waste can also originate from a variety of other sources, such as cropland, municipal and industrial discharges, and urban runoff."[25] Why do pollutants associated with animal waste now find their way to the diverse conduits Copeland describes? One answer lies in the way that CAFOs use land and dispose of the wastes associated with their operations.

B. A Changing Industry Produces Greater Quantities of Pollutants

Over the last few decades, agriculture has changed dramatically. Large-scale livestock facilities operate in a number of states and generate billions of dollars of revenue every year.[26] These industrial-size facilities increasingly replace small farms and confine thousands, or even millions, of animals in small areas.[27] The amount of land per animal unit (AU) declined nearly 40% from 1982 to 1997—from 3.6 acres to 2.2 acres per AU across all animal types. Larger operations focus primarily on animal production, which means such facilities have less land on which to spread the increasing amounts of manure, the major source of pollutants from CAFOs. The increased rate of animal-waste production without adequate land to dispose of it translates into the release of pollutants. Pollutants may originate at production houses and feedlots where animals are kept; manure storage facilities such as tanks, ponds, and lagoons; or on land where the manure is collected or applied.[28]

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21 *Id.*

22 *Id.*

23 Claudia Copeland, Cong. Research Serv., RL 33656, Animal Waste and Water Quality: EPA's Response to the *Waterkeeper Alliance* Court Decision on Regulation of CAFOs 1 (2007), *available at* http://www.cnie.org/NLE/CRSreports/07Aug/RL33656.pdf.

24 *Id.*

25 *Id.*

26 Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 493 (2d Cir. 2005) (citing EPA data indicating that by 1997, the value of poultry production exceeded $21.6 billion, and much of the poultry output was generated by corporate producers on large facilities producing more than 100,000 birds).

27 Merkel, *supra* note 14, at 1.

28 *See generally,* William D. McBride & Nigel Key, *Economic and Structural Relationships in U.S. Hog Production*, USDA, Agric. Econ. Rep. No. 818 (Feb. 2003), *available at* http://www.ers.usda.gov/publications/aer818/aer818.pdf; *see also* Noel Gollehon et al., U.S. Dep't of Agric., Agric. Bull. No. 771, Confined Animal Protection and Manure Nutrients 16–19 (2001), *available at* http://www.ers.usda.gov/publications/aib771/aib771.pdf.

As early as 1997, animal-feeding operations controlled only enough cropland and permanent pastures with the capacity to assimilate 40% of the nitrogen and 30% of the phosphorous in the manure produced.[29] Large farms accounted for only 2% of the total number of farms but almost half of the excess onsite nutrients.[30] Experts observe that CAFOs continue to increase in size and use smaller units of land for the number of livestock raised, which suggests federal and state authorities need to enforce their regulations more stringently to keep pace with the causes of CAFO pollution.[31]

C. Corporate and Regional Concentration of CAFOs

Agricultural economists have documented the increasing corporate and geographical concentration of CAFOs and the concerns these changes have produced. Increased size and consolidation have resulted in geographic diversity and the increasing predominance of multistate operations.[32] Increasingly sophisticated technology has made larger facilities possible; in turn, even larger facilities result from economy of scale.[33] Vertical integration and production contract agreements have proliferated and further decreased the number of corporations in the industry.[34] The consolidation of livestock corporations and the vertical integration of individual producers have resulted in fewer farms with confined animals, yet a steadily increasing number of confined animals are produced. Smaller operations are being replaced by larger and larger operations.[35]

The regions with the greatest number of CAFOs have also changed since the early 1980s. The number of animals in CAFOs increased 40% in the Prairie Gateway region (consisting of Texas, Oklahoma, Kansas, and surrounding areas) and 70% in the Southern Seaboard Region (which includes most of Virginia, Alabama, and Georgia, as well as North and South Carolina).[36] The areas that have seen significant declines are the Northern Crescent (Maryland and northward) as well as the Heartland (Northern Missouri, Iowa, Indiana, Illinois, Ohio, and surrounding areas).[37] This indicates a migration of operations into the Southeastern Coast and to the Southern Great Plains.[38]

The characteristics of the CAFO industry described here demonstrate that sound environmental policy requires a national approach. This article focuses on EPA's national standards and the need for states to be cognizant of the multistate nature of the industry. Given the focus on and importance given to compliance that has resulted

29 *See* NOEL GOLLEHON ET AL., U.S. DEP'T OF AGRIC., AGRIC. BULL. NO. 771, CONFINED ANIMAL PROTECTION AND MANURE NUTRIENTS (2001), *available at* http://www.ers.usda.gov/publications/aib771/aib771.pdf.

30 *Id.* at 17.

31 *Id.* at 31–32.

32 Marc Ribaudo & Noel Gollehon, *Animal Agriculture and the Environment*, *in* AGRICULTURAL RESOURCES AND ENVIRONMENTAL INDICATORS 147–156 (Keith Wiebe & Noel Gollehon eds., Nova Science Publishers, Inc. 2007).

33 *Id.*

34 *Id.*

35 GOLLEHON ET AL., *supra* note 28, at 10.

36 *Id.* at 11–15.

37 *Id.*

38 Ribaudo & Gollehon, *supra* note 32, at 148–49.

from the Sunset process, Texas should consider a shift in the compliance history evaluation of CAFOs that corresponds with reality. Subsequent sections of this article will develop the concept further.

III. The Clean Water Act, EPA, and a Regulatory Framework

Because Texas permits CAFOs pursuant to a delegation by EPA under the CWA, any discussion of Texas CAFO regulation requires a basic understanding of federal CAFO law and regulation. Texas has patterned the basic framework of its CAFO regulations in compliance with the federal rules discussed in this article: the size of facilities, for example. [39]

At the same time, one should not equate the federal law this article discusses with Texas CAFO regulation. As the CWA's savings clause makes clear, nothing in federal CAFO law or regulations "[s]hall restrict any right . . . under any statute or common law to seek enforcement of any effluent standard or limitation or to seek any other relief."[40] On certain issues, Texas has accepted this invitation to treat the federal CAFO regulations as a federal floor and impose more stringent regulation.

In fact, the most hotly contested issue in both *Waterkeeper Alliance* and *Pork Producers*—whether EPA can require CAFO facilities to apply for a permit before they actually discharge water pollutants—provides an example. Texas simply bases the obligation to apply for a permit on the type of livestock raised and the size of the facility[41] rather than an actual discharge, a "potential to discharge," or a "proposal to discharge."

With the caveat that Texas law and regulation sometimes departs from the federal "floor" regulations, this section seeks to define CAFOs under federal and state law and the legal bases for their regulation under the CWA. Further, this section describes the evolution of EPA's efforts to regulate CAFOs. It focuses in particular on the comprehensive revision of existing CAFO rules that EPA promulgated in 2003, the widespread reaction from industrial agricultural interests as well as environmental organizations, and the resulting litigation in *Waterkeeper Alliance*.[42] The discussion of this case will help to explain some of the changes to the 2008 rules now in effect.

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39 *See What are Concentrated Animal Feeding Operations? When Must One Have a Permit?*, Tex. Comm'n on Envtl. Quality, http://www.tceq.texas.gov/permitting/wastewater/cafo/cafo_definitions.html (last modified Jan. 6, 2011). Compare the livestock numbers for different facility categories under the Texas rules with those identified in the federal regulations, *see infra* note 43.

40 33 U.S.C. §1365(e).

41 *See* Tex. Comm'n on Envtl. Quality, *supra* note 39.

42 Waterkeeper Alliance Inc. v. EPA, 399 F.3d at 486, 486 (2d Cir. 2005).

A. The Components of a CAFO under Federal Law: Increasing Federal Regulation through the 2003 Federal CAFO Rules

Federal CAFO rules establish populations that qualify facilities as either medium or large CAFOs subject to water quality regulation.[43] Texas uses these same numbers to categorize medium- and large-sized CAFOs.[44]

In addition to the categories and numbers of animals a facility maintains, federal and Texas rules consider a facility to constitute a CAFO only when "[a]nimals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period . . . [and] . . . [c]rops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility."[45] Also, one of the following conditions must be satisfied:

> (A) Pollutants are discharged into waters of the United States through a man-made ditch, flushing system, or other similar man-made device; or
> (B) Pollutants are discharged directly into waters of the United States which originate outside of and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation.[46]

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43 The definition of a CAFO is "an AFO [animal feeding operation] that is defined as a Large CAFO or as a Medium CAFO by the terms of this paragraph, or that is designated as a CAFO in accordance with paragraph (c) of this section." 40 C.F.R. § 122.23(b)(2) (2011).

To be categorized as a Medium CAFO, the AFO must stable or confine between 200 to 699 mature dairy cows, whether milked or dry; 300 to 999 veal calves; 300 to 999 cattle other than mature dairy cows or veal calves; 750 to 2,499 swine each weighing 55 pounds or more; 3,000 to 9,999 swine each weighing less than 55 pounds; 150 to 499 horses; 3,000 to 9,999 sheep or lambs; 16,500 to 54,999 turkeys; 9,000 to 29,999 laying hens or broilers if the AFO does use a liquid manure handling system ; 37,500 to 124,999 chickens (other than laying hens) if the AFO does not use a liquid manure handling system; 25,000 to 81,999 laying hens if the AFO does not use a liquid manure handling system; 10,000 to 29,999 ducks if the AFO does not use a liquid manure handling system; or 1,500 to 4,999 ducks if the AFO does use a liquid manure handling system. 40 C.F.R. § 122.23(b)(6) (2011).

To be categorized as a Large CAFO, the AFO must stable or confine at least 700 mature dairy cows, whether milked or dry; 1,000 veal calves; 1,000 cattle other than mature dairy cows or veal calves; 2,500 swine each weighing 55 pounds or more; 10,000 swine each weighing less than 55 pounds; 500 horses; 10,000 sheep or lambs; 55,000 turkeys; 30,000 laying hens or broilers if the AFO does use a liquid manure handling system ; 125,000 chickens (other than laying hens) if the AFO does not use a liquid manure handling system; 82,000 laying hens if the AFO does not use a liquid manure handling system; 30,000 ducks if the AFO does not use a liquid manure handling system; or 5,000 ducks if the AFO does use a liquid manure handling system. 40 C.F.R. § 122.23(b)(3) (2011).

44 *See* TEX. COMM'N ON ENVTL. QUALITY, *supra* note 39.

45 *Id.*

46 40 C.F.R §§ 122.23(b)(6)(ii)(A)–(B) (2011).

A facility that qualifies as a medium or large CAFO must meet CWA requirements, which prohibit the discharge of a pollutant by any point source to navigable waters except when authorized by a permit issued under the National Pollutant Discharge Elimination System (NPDES).[47] EPA furthers the CWA's objectives—including the ultimate objective not just to reduce, but to eliminate the discharge of water pollutants—by authorizing certain discharges but placing important restrictions on the quality and character of allowable discharges.[48]

EPA describes the components of a CAFO facility from which one could anticipate discharges of polluted water as follows: "animal confinement areas; feed storage areas; manure, litter, process wastewater storage areas; confinement house ventilation fan[s] . . . ; land-applied manure, litter, or process wastewater; and other site specific sources [or] . . . pathways for pollutants from the CAFO to reach waters of the United States."[49] Land-applied pollutant waste products are subject to permitting requirements only if the facility applies manure in a manner that deviates from accepted practice and causes the discharge of polluted water that exceeds the quantity exempted for agricultural storm water runoff.[50]

The point-source discharge rules EPA enacted in the 1970s with respect to the five above-described areas remained essentially unrevised until the late 1990s when EPA initiated a review of its CAFO rules.[51] At that time, Congress also looked into CAFO issues, primarily through oversight hearings in 1999 and 2001.[52] In 2000, EPA presented proposed CAFO rule revisions to the public; during the following two years, these proposals provoked a groundswell of responses from the regulated agricultural community, as well as environmental organizations.[53] Industry groups opposed the

47 *See Clean Water Act*, Envtl. Prot. Agency, http://cfpub.epa.gov/npdes/cwa.cfm?program_id=6 (last updated Aug. 12, 2011).

48 33 U.S.C. §§ 1251(a)(1), 1342–43 (2011).

49 Office of Wastewater Mgmt., Office of Water, U.S. Envtl. Prot. Agency, *Implementation Guidance on CAFO Regulations – CAFOs That Discharge or Are Proposing to Discharge* (May 28, 2010), http://www.epa.gov/npdes/pubs/cafo_implementation_guidance.pdf [hereinafter EPA Implementation Guidance].

50 Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 506–12 (2d Cir. 2005).

51 Copeland, *supra* note 23, at 2–3.

52 *Id.*

53 *See, e.g.*, Charles W. Abdalla, *The Industrialization of Agriculture: Implications for Public Concern and Environmental Consequences of Intensive Livestock Operations*, 10 Penn St. Envtl. L. Rev. 175, 190 (2002) (advocating greater regulatory scrutiny of jurisdictional boundaries for regulating animals); Terence J. Centner, *Establishing a Rational Basis for Regulating Animal Feeding Operations: A View of the Evidence*, 27 Vt. L. Rev. 115, 138–42 (2002) (exploring the quality of evidence being cited to justify new federal regulations for CAFOs); Theodore A. Feitshans & Kelly Zering, *Federal Regulation of Animal Poultry Production Under the Clean Water Act: Opportunities for Employing Economic Analysis to Improve Societal Results*, 10 Penn St. Envtl. L. Rev. 193, 209–15 (2002) (advocating regulations that consider social welfare and efficacy); David R. Gillay, *Oklahoma's Concentrated Animal Feeding Operations Act: Balancing the Interests of Landowners with the Exponential Growth of the Hog Industry* 35 Tulsa L.J. 627, 642–49 (2000) (analyzing CAFO regulations); Martin A. Miller, *Coping with CAFOs: How Much Notice Must a Citizen Give?*, 68 Mo. L. Rev. 959, 981–82 (2003) (examining a citizens suit against a CAFO that suggests increased liability for CAFOs); Nancy A. Welsh & Barbara Gray, *Searching for a*

proposed permitting requirements as costly and unnecessary; environmental groups urged the creation of more stringent national standards, including improved control technology such as Best Control Technology to limit the release of pathogens from CAFO facilities. EPA revised the 2000 proposals, and in late 2002, issued its final revisions to the rules, which became effective on April 14, 2003.[54]

The 2003 rules revised the way EPA regulated discharges of manure, wastewater, and other process wastes from CAFOs and modified permitting requirements and applicable effluent limitation guidelines. Importantly, the rules created two new requirements: (1) all CAFOs must apply for a discharge permit; and (2) all CAFOs must develop and implement a nutrient management plan (NMP), in part to ensure that the facilities would apply manure to land at rates that minimized water pollution.[55]

B. *WATERKEEPER ALLIANCE*: JUDICIAL SCRUTINY OF THE 2003 FEDERAL CAFO RULES AND A RESULTING CHANGE IN FOCUS

As with the 2000 proposals, the 2003 final rules met opposition, which culminated in litigation among agricultural and environmental interests. On February 28, 2005, the Second Circuit Court of Appeals issued its decision in *Waterkeeper Alliance*.[56] It is worthwhile to consider the *Waterkeeper Alliance* decision because it resulted in the revised CAFO rules promulgated by EPA in 2008. Some issues discussed in *Waterkeeper Alliance* illustrate the water pollution problems at CAFOs and how EPA sought to address them. The decision also sheds light on the post-2008 federal CAFO rules and the specific kinds of past violations that should play a role when an agency evaluates a corporation's compliance history. This discussion will focus only on issues of particular relevance to compliance history and enforcement.

1. NO DUTY TO APPLY BASED ON A "POTENTIAL TO DISCHARGE"

Most importantly, *Waterkeeper Alliance* agreed with the agricultural appellants that EPA's 2003 rules exceeded the agency's authority under the CWA by imposing on all CAFOs a "duty to apply" for an NPDES point-source permit and an agricultural storm-water exemption.[57] If the facility had a "potential to discharge" point-source pollutants, the rules required a permit, even if a new facility did not anticipate discharges

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Sense of Control: The Challenge Presented By Community Conflicts Over Concentrated Animal Feeding Operations, 10 PENN ST. ENVTL. L. REV. 295, 315–21 (2002) (evaluating decision making processes to address CAFO-related disputes); Amy Willbanks, *The Unified National Strategy for Animal Feeding Operations: Another Federal-State Partnership in Environmental Regulation,* 8 S.C. ENVTL. L.J. 283, 288–89 (2000) (intimating that the federal government will become more active in responding to water pollution problems).

54 COPELAND, *supra* note 23, at 2–3.

55 National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. 7176 (Feb. 12, 2003) (codified at 40 C.F.R. pts. 9, 122, 123, and 412) *available at* http://www.epa.gov/npdes/regulations/cafo_fedrgstr_chapt5.pdf (noting that at a minimum, a nutrient management plan establishes the requirements a facility must satisfy with regard to storage of manure and litter and management of treated wastewater, taking into account levels of pollutants like nitrogen and phosphorous).

56 Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 506–12 (2d Cir. 2005).

57 *Id.*

or, with respect to an existing permit, no such discharges had ever occurred.[58] Because *Waterkeeper Alliance* rejected the universal duty to apply for a permit, the 2008 revised rules require an NPDES permit and stormwater exemption only if a facility discharged or proposed to discharge such wastewater.[59]

2. No Need to Apply Based on a "Proposal to Discharge"

Subsequent to the promulgation of EPA's 2008 rules in response to *Waterkeeper Alliance*, the Fifth Circuit Court of Appeals considered the agency's requirement that facilities "proposing to discharge" apply for a permit. As in *Waterkeeper Alliance*, which rejected the "potential to discharge" formulation in the 2003 rules, the Fifth Circuit in *National Pork Producers* rejected the 2008 "proposal to discharge" iteration:

> [Federal precedent] leave[s] no doubt that there must be an actual discharge into navigable waters to trigger the CWA's requirements and the EPA's authority. Accordingly, the EPA's authority is limited to the regulation of CAFOs that discharge. Any attempt to do otherwise exceeds the EPA's statutory authority. Accordingly, we conclude that the EPA's requirement that CAFOs that "propose" to discharge apply for an NPDES permit is ultra vires and cannot be upheld.[60]

Both *Waterkeeper Alliance* and *National Pork Producers* concluded that EPA cannot require facilities to apply for a permit or general permit coverage until they actually discharge manure into a stream. Moreover, EPA's own administrative records likely contain sufficient evidence to form an administrative presumption that AFOs and CAFOs are designed to discharge.[61] As such, both *Waterkeeper Alliance* and *National Pork Producers* both fall victim to an interpretation of the CWA that produces an absurd result: the NPDES program applied to agriculture, unlike the same program applied to every other industry, is not intended to prevent discharges before they occur.

This recurrent issue on the federal level has important consequences for the Texas compliance history rules, which is why this article addresses these federal issues. The assumption underlying the compliance history rules is that comprehensive regulation of CAFOs, documentation of their permit violations, and a system that translates those violations into a compliance rating or score will help prevent discharges before they occur. The entire compliance history system relies on comprehensive permitting and effective documentation of the way facilities operate. Clearly, such a system cannot function if the state commits an ultra vires act by requiring a facility to seek a permit in the first instance.

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58 *Id.*

59 40 C.F.R § 122.23(d) (2011).

60 Nat'l Pork Producers Council v. Envtl. Prot. Agency, No. 635 F.3d 738 (5th Cir. 2011).

61 Karla A. Raettig, *Improvements Needed in Permitting CAFOs Under the Clean Water Act*, Environmental Integrity Project (Sep. 28, 2007), http://www.environmentalintegrity.org/pdf/publications/NPDES_permitting.pdf.

3. Nutrient Management Plans (NMP)

The *Waterkeeper Alliance* court also concluded that EPA erred when it failed to require a facility to include the specific requirements of its NMP in its permit.[62] NMPs establish requirements for the storage of manure, litter, and process wastewater, as well as nutrients associated with livestock operations such as nitrogen and phosphorous.[63] The 2003 rules left the creation and maintenance of these plans to individual CAFOs.[64] EPA did not require NMPs to form part of the NPDES permit.[65] The court concluded that the CWA required effluent limitations to be included, whether or not they were quantitative; the qualitative standards were subject to the same requirement.[66] The 2008 rules required permit applications to include NMPs and that site-specific NMPs be developed for facilities eligible for coverage under a general permit.[67] As *Waterkeeper Alliance* required, such a site-specific NMP would be subject to public inspection and comment before a facility could gain authorization under the general permit.[68]

C. Relevance of EPA Rules and *Waterkeeper Alliance* to Compliance History

The development of federal rules and their shift in focus after *Waterkeeper Alliance* raise issues directly relevant to the use of compliance history in water-quality regulation. Fundamentally, EPA's 2003 and 2008 rulemaking initiatives sought to expand the number of facilities subject to CWA regulation. EPA estimated that the 2003 rules would expand the number of facilities required to obtain water-quality permits from about 12,800 prior to 2003 to approximately 15,500, which represented approximately 20% of all CAFOs in the United States.[69] EPA also acknowledged that, until 2003, only 4,000 CAFOs were permitted.[70] Therefore, any effort to evaluate a company's individual CAFO based on how that company's other facilities perform would require close to universal CAFO permitting.

Moreover, *Waterkeeper Alliance*'s holding that a facility's NMP should be incorporated into its water-quality permit bears relevance to compliance history. EPA or the state agency has better access to information central to the operation of a CAFO. Making the management of manure, litter, process wastewater, and nutrients such as nitrogen and phosphorous a matter of public record improves the ability of both EPA and the public to monitor compliance.[71] More scrupulous monitoring would enable EPA to assess specific practices at CAFOs; for example, the rate at which a facility applies waste to land would be easier to access. Maintenance of a NMP that conforms to

62 *Waterkeeper Alliance*, 399 F.3d at 502–06.
63 *Id.* at 495–99.
64 *Id.* at 495.
65 *See generally id.*
66 *Waterkeeper Alliance*, 399 F.3d at 496.
67 40 C.F.R. § 122.23 (2011).
68 *Waterkeeper Alliance*, 399 F.3d at 501–04.
69 COPELAND, *supra* note 23, at 2.
70 *Id.*
71 40 C.F.R § 122.42(e)(1) (identifies the requirements to develop and implement a nutrient management plan).

EPA guidelines can also be considered when deciding whether a facility discharges or proposes to discharge for purposes of obtaining an NPDES permit.[72]

The discussion thus far demonstrates that, to the extent possible after *Waterkeeper Alliance*, EPA sought to maintain a universal permitting requirement similar to the prior "duty to apply." The real key to EPA's understanding of the new permit rule, however, lies in the relationship between future "proposals to discharge" and past or current "discharges." For purposes of this article, what emerges is striking. EPA makes current and future decisions about a CAFO permit based chiefly on an owner or operator's compliance history, including its subsequent remedial actions for past violations. The 2008 revised rules made in response to *Waterkeeper Alliance*—as well as the guidance documents the agency has released to interpret the new rules—emphasize that past or present discharges constitute a factor in determining whether to obtain a permit.[73] The Preamble to the 2008 CAFO Rule reasons that:

> Such intermittent, sporadic, even occasional, discharges may in fact be the norm for many CAFOs, but they are nonetheless "discharges" under the CWA and are prohibited unless authorized under the terms of an NPDES permit. CAFOs that have had such intermittent or sporadic discharges in the past would generally be expected to have such discharges in the future, and therefore be expected to obtain a permit, unless they have modified their design, construction, operation, or maintenance in such a way as to prevent all discharges from occurring.[74]

EPA's reasoning bears emphasis because it demonstrates the central role that compliance history plays in the entire NPDES permitting process for CAFOs. EPA declares that, absent clear modifications in design, construction, operation, or maintenance, illegal discharges in the past should be construed as continuous, intermittent, or occasional discharges in the future. Past performance does not simply make future violations more or less likely. Instead, a presumption exists that past violations translate into current and future violations absent demonstrated changes to the facility.[75] A CAFO's "continuous, intermittent, or sporadic" discharges in the past influence not just EPA's initial decision to permit but subsequent decisions as well, up to and including the termination of permits for noncompliance.[76]

EPA's efforts to compile the compliance records of approximately 800,000 facilities—some of them CAFOs regulated under the CWA—reflects the federal agency's emphasis on compliance history: "inspections, violations, and enforcement."[77] EPA

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72 *See generally* EPA Implementation Guidance, *supra* note 49.

73 *Id.* at 2–3; *see also* Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines for Concentrated Animal Feeding Operations in Response to Waterkeeper Decision, 73 Fed. Reg. 70418 (Nov. 20, 2008) [hereinafter Preamble to the 2008 CAFO Rule] (codified at 40 C.F.R pts. 9, 122, and 412).

74 Preamble to the 2008 CAFO Rule, *supra* note 73.

75 *Id.* at 70423.

76 40 C.F.R § 122.64 (2011).

77 *Enforcement and Compliance History Online (ECHO)*, Entl. Prot. Agency, http://www.epa-echo.gov/echo/ (last updated Sept. 7, 2011) [hereinafter ECHO].

declares that the "Enforcement and Compliance History Online" website (ECHO) enables the public to retrieve the compliance records of facilities in their community.[78]

Moreover, EPA clearly contemplates that the states will use compliance history to make permitting decisions. Whether to authorize a CAFO under a general or individual permit provides a conspicuous example.[79] EPA notes that NPDES regulations provide it, or state permitting authorities, with the discretion to determine which permit would be most appropriate given the facts peculiar to a specific CAFO.[80] A primary consideration is the facility's compliance history, as "EPA recognizes that most CAFOs will likely be covered by NPDES general permits; however, there are some circumstances when an individual permit might be appropriate . . . e.g., . . . facilities that have a history of noncompliance. . . ."[81] Compliance history, whether evaluated at the federal or state level, focuses on persons, not facilities. As the Preamble to the 2008 CAFO Rule explains, "the Clean Water Act regulates the conduct of persons, which includes the owners and operators of CAFOs rather than the facilities or their discharges."[82]

When TCEQ makes CAFO-related permitting decisions like this one, it does so under its authority as a permitting authority that administers the federal NPDES (rendered TPDES) program. A memorandum of agreement (MOA) between TCEQ's predecessor agency, the Texas Natural Resource Conservation Commission (TNRCC), and EPA confers this responsibility on TCEQ.[83] The MOA itself places emphasis on compliance measures Texas is required to administer to retain the delegation, including compliance-related recordkeeping that forms the basis of compliance history records.[84] Both EPA and NPDES rules regarding CAFOs assume that a state will take compliance history into account: continuous, intermittent, or sporadic discharges or other permit violations in the past should play an important role in making permit decisions in the present. The remaining sections of this article examine how Texas complies with this federal expectation, whether in law, regulations, or actual regulatory activity.

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78 *First Time Users*, ENTL. PROT. AGENCY, http://www.epa-echo.gov/echo/first_time_users.html (last updated May 16, 2011).

79 National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. 7176, 7232 (Feb. 12, 2003) (codified at 40 C.F.R. pts. 9, 122, 123, and 412) *available at* http://www.epa.gov/npdes/regulations/cafo_fedrgstr_chapt5.pdf.

80 *Id.*

81 *Id.*

82 Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines and Standards for Concentrated Animal Feeding Operations in Response to the Water Keeper Decision, 73 Fed. Reg. 70418 (Nov. 20, 2008) (codified at 40 C.F.R. pts. 9, 122, and 412) *available at* http://www.gpo.gov/fdsys/pkg/FR-2008-11-20/pdf/E8-26620.pdf.

83 *See* Memorandum of Agreement between the Tex. Natural Res. Conservation Comm'n and the U.S. EPA Region 6 (May 5, 1998), *available at* www.epa.gov/region6/water/npdes/docs/texas_moa.pdf.

84 *Id.* at 37–38.

IV. The Texas Legislature, TCEQ, and the Evolution of Compliance History in Texas

The goal of creating a system that effectively incorporates compliance history into the CAFO-permitting process has fallen short in Texas, both because of the rules TCEQ enacted and the way the agency administers them in response to legislative requirements. Before one can evaluate whether the problems just described actually exist, however, one must understand the Texas law and rules that create the framework for considering compliance history when making permit-related decisions. This section explains the legislature's mandate to TCEQ to monitor the compliance history of all entities the commission permits, including CAFOs, and to develop a performance-rating system that would enable the TCEQ to use compliance as an important consideration at almost every phase of permit-related decisionmaking. The compliance history and rating system that TCEQ developed in response to this mandate then receives attention.

A. TCEQ CAFO Permitting Requirements and Compliance History

Texas rules prohibit the discharge or disposal of manure, litter, or wastewater from AFOs into or adjacent to waters in the state except in accordance with an individual water-quality permit issued by TCEQ or a CAFO general permit or other authorization.[85] Current rules adopted by TCEQ pre-*National Pork Producers* confirm that CAFO owners and operators "have a duty to seek coverage" as provided by the rules.[86] By requiring facilities to obtain coverage without regard to "discharges or propos[als] to discharge," the Texas CAFO rules echo the pre-*Waterkeeper Alliance* regulatory landscape: facilities with the "potential to discharge" must obtain permit coverage.[87]

A basic difference between federal and Texas regulation concerns the manner in which past compliance with environmental law and regulation is used. Without question, EPA has devoted a great deal of attention to bringing facilities into compliance and letting the public know which ones have violated the law.

The ECHO program provides a vast database to the public to learn whether facilities near them comply with the law. Specifically with respect to CAFOs, EPA has established compliance procedures that include inspections, reports, record reviews, and self-reporting by facilities.[88] CAFOs can be subject to civil investigations if the agency learns of serious, widespread, and/or continuing permit violations.[89] As the previous discussion reflects, EPA premises permitting decisions on past compliance.

Texas, however, has taken the basic premise that a permitting authority should take past compliance into account when making permit-related decisions and devel-

85 30 Tex. Admin. Code § 321.31(a) (2011) (Tex. Comm'n on Envtl. Quality, Concentrated Animal Feeding Operations).

86 *Id.* § 321.33(a).

87 *Id.*

88 *Clean Water Act Compliance Monitoring*, Entl. Prot. Agency, http://www.epa.gov/compliance/monitoring/programs/cwa/index.html (last updated Mar. 17, 2010).

89 *Civil Investigations*, Envtl. Prot. Agency, http://www.epa.gov/compliance/monitoring/investigations/index.html (last updated Jan. 2, 2009).

oped it into a highly detailed system. In 1985, the legislature formulated the broad outline of a compliance history system and charged TNRCC with fleshing out specific rules and making the system effective.

In what became § 5.754 and § 26.0281 of the Texas Water Code, the legislature established the framework for compliance history development and application. At the outset, one is struck by the range of commission decisions in which compliance history should play a role: (a) whether to issue a permit at all;[90] (b) whether to amend a permit;[91] (c) whether to perform announced inspections;[92] (d) whether to take enforcement actions;[93] (e) whether to enhance penalties for repeat violations;[94] (f) whether to renew a permit;[95] (g) whether to deny a permit;[96] (h) whether to suspend a permit;[97] (i) whether to revoke a permit;[98] (j) what added oversight the commission should exercise over a violating facility; [99] and (k) whether an owner or operator is entitled to obtain a flexible permit.[100]

This list is striking because it indicates the legislature sees compliance history as a significant consideration in every phase of the permitting process.[101] Keeping track of owner or operator's compliance is intended to be more than an exercise in keeping good records. How an owner or operator performed in the past is to play a role in virtually every permit decision imaginable in the present.

The question remains, however, what is the requisite level of non-compliance that warrants an adverse action on any of the above-described permit actions. The legislature instructed TCEQ to devise a means by which an owner or operator could be classified as a high, average, or poor performer. The legislature recently amended § 5.754 and changed these classifications to above-satisfactory, satisfactory, unsatisfactory, and unclassified.[102] The statute does not suggest that an owner or operator's status in this hierarchy would automatically subject it to adverse action in any of the above permit-related decisions. However, the legislature apparently did intend that performance status should play a significant role in TCEQ's permit-related decision making.

Further, the legislature instructed TCEQ on the factors it should consider when determining compliance history classification.[103] When TCEQ cites a facility for violating the law, TCEQ rules, or its permit, TCEQ is to characterize the violation as major, moderate, or minor.[104] TCEQ is to determine what constitutes a "repeat violator" while giving consideration to the size and complexity of the site at which the

90 TEX. WATER CODE ANN. § 5.754(e)(1) (West 2011).
91 *Id.*
92 *Id.* § 5.754(e)(3).
93 *Id.* § 5.754(e)(2).
94 *Id.* § 5.754(f).
95 *Id.* § 5.754(e)(1).
96 *Id.*
97 *Id.*
98 *Id.*
99 *Id.* § 5.754(g).
100 *Id.* § 5.754(h)(2).
101 *Id.* § 5.754.
102 *Id.* § 5.754(b).
103 *Id.* § 5.754(c).
104 *Id.* § 5.754(c)(1).

violations occurred and limiting violations of the same nature and same environmental media that occurred in the preceding five years.[105] A problem emerges from these statutory provisions. On the one hand, the legislature made it abundantly clear that TCEQ should treat compliance history as a significant factor at each phase of the permitting process, from the initial application to the hypothetical revocation of a permit. On the other hand, the statute identifies a number of factors on which to base its decisions and gives TCEQ discretion to define those factors. The overriding legislative goal appears lost in the multiplicity of factors and TCEQ's discretion to define them. However, the statute makes abundantly clear that compliance history should not drown in the morass of TCEQ discretion.[106] Nowhere is this clearer than in § 5.754(i), which states in part:

> *The commission shall consider the compliance history of a regulated entity when determining whether to grant the regulated entity's application for a permit or permit amendment for any activity under the commission's jurisdiction* . . . . [N]otwithstanding any provision of this code or the Health and Safety Code relating to the granting of permits or permit amendments by the commission, the commission, after an opportunity for a hearing, *shall deny a regulated entity's application for a permit or permit amendment if the regulated entity's compliance history is unacceptable based on violations constituting a recurring pattern of conduct that demonstrates a consistent disregard for the regulatory process,* including a failure to make a timely and substantial attempt to correct the violations.[107]

Despite the creation of a multifactor test that the TCEQ rules define, the legislature did not intend to make compliance history an optional consideration when the commission evaluates permits.

B. TCEQ Translates the Compliance History Laws into Rules

The federal CAFO regulation emphasized that EPA intended its 2008 revised rules to apply to persons—entities that could own and/or operate more than one facility—and not to individual facilities. In § 5.754(a) of the Texas Water Code, the legislature required TCEQ to "establish a set of standards for the classification of a person's compliance history."[108] Section 26.001(25), in turn, defines a person as an "individual, association, partnership, corporation, municipality, state or federal agency, or an agent or employee thereof."[109]

Consistent with the mandate from federal regulators and state legislators to evaluate compliance history on the basis of real or legal persons who could own a number of facilities, TCEQ's compliance rules refer to the evaluation of individual sites but also of persons who own or operate a number of facilities.[110] Indeed, § 60.2(f) of

105 *Id.* §§ 5.754(c)(2)–(3).
106 *Id.* § 5.754(i).
107 *Id.* (emphasis added).
108 *Id.* § 5.754(a).
109 *Id.* § 26.001(25).
110 30 Tex. Admin. Code § 60.2 (Tex. Comm'n on Envtl. Quality. Compliance History).

TCEQ's compliance history rules declares that TCEQ will calculate a "person classification" by averaging the site ratings of all the sites owned or operated by that person in the state of Texas.[111] Section 60.2(g) then imposes on TCEQ the responsibility to post both person and site ratings on their website.[112]

Texas's compliance history rules acknowledge the need to consider out-of-state compliance history when TCEQ evaluates a new permit application. The rules provide that TCEQ should evaluate "final enforcement orders, court judgments, and criminal convictions relating to violations of environmental laws of other states," with the qualification that such documents should be considered only to the extent that they are "readily available to the Executive Director."[113] Undoubtedly, because this provision has languished unused, the phrase "readily available" remains undefined. If one accepts the plain meaning of the phrase, however, the vast majority of compliance-related information on an out-of-state CAFO applicant is "readily available."[114] ECHO contains CAFO-enforcement data compiled nationwide.[115] EPA provides other databases on multi-media facilities and those permitted under NPDES.[116] Any pending litigation or judgment rendered against a CAFO in a federal court could be located on Public Access to Court Electronic Record (PACER).[117] Conceivably, state court judgments would require research that would leave the realm of "readily available," but TCEQ could require the names of any parent corporations on an application as well as the other states in which the corporation operates CAFO facilities.

This discussion of "readily available" belabors the obvious but points out an oddity in the way TCEQ calculates compliance history. First, as already noted, the rules themselves require TCEQ to consider an applicant's out-of-state violations. Later in the compliance history rules, however, a person's compliance rating is to be calculated by averaging the compliance scores of that person's facilities in Texas.[118] A new applicant would have no such facilities, which leads TCEQ to assign new out-of-state applicants the "average performer by default" designation.[119] As written, the rules require TCEQ to consider out-of-state compliance history but ignore it when assigning a compliance rating to the person, that is, the corporation. TCEQ personnel confirm the practice of assigning out-of-state applicants an average by default rating and suggest that any other approach would be unworkable, in part because TCEQ would not know what to make of judgments for CAFO violations in another jurisdiction.[120] If another state runs a delegated program that adopts the basic federal guidelines, one wonders

111 30 TEX. ADMIN. CODE § 60.2(f).
112 *Id.* § 60.2(g).
113 *Id.* § 60.1(c)(3).
114 *Id.* § 60.1.
115 ECHO, *supra* note 74.
116 *See Results Guide*, ENVTL. PROT. AGENCY, http://www.epa-echo.gov/echo/resultsguide.html (last updated May 16, 2011) (listing several databases accessed from this page).
117 *See* PUBLIC ACCESS TO COURT ELECTRONIC RECORDS (PACER), http://www.pacer.gov/ (last visited Oct. 15, 2011).
118 30 TEX. ADMIN. CODE § 60.2(f).
119 *See id.* § 60.2(b).
120 Interview with Laurie Fleet, CAFO Team Leader, Water Quality Assessment, Tex. Comm'n on Envtl. Quality, in Austin, Tex. (Oct. 7, 2010).

why experts in Texas would find an unauthorized CAFO discharge into the waters of the United States unfathomable if it occurred in Missouri.

C. An Example of a Multi-state Incident

A CAFO that placed a pathogen in the stream of commerce illustrates problems similar to those that necessitate the expanded, multistate use of compliance history information to prevent water pollution. In the summer of 2008, a salmonella outbreak from tainted eggs affected large portions of the country.[121] The multistate incident ultimately led to the recall of approximately 500 million eggs.[122] As the incidents were investigated, a poultry CAFO owner and operator named Austin J. DeCoster emerged as the source.[123] DeCoster owned the offending facilities in Iowa—Hillandale Farms and Wright County Eggs, but had also run operations in Maine, where he faced regulatory and legal problems.[124]

Granted, a contaminant that enters the stream of commerce through contaminated food from a CAFO differs from surface-water pollution. However, the salmonella outbreak warrants scrutiny in this context. A Maine CAFO with a number of health and environmental violations moved to Iowa. Iowa permitted the corporation's facility, either without knowledge of, or concern for, past compliance history. Once in Iowa, the corporation exhibited negligent practices once again. Widespread public health risks resulted. Although the public likely forgot the multistate salmonella scare and saw it as an isolated event, public health experts construed the event differently: CAFOs pose ongoing environmental and public health threats on a regional or national basis.[125] With respect to water quality, Texas cannot afford to do what Iowa did in the Hillandale Farms case given an industry increasingly dominated by corporations operating large facilities in a number of states.

Texas is the number one producer of manure in the United States and in the top ten to fifteen states in which CAFO facilities in all three major categories are located: chicken, hog, and cattle.[126] CAFO operators from all over the country have chosen Texas for their operations. An unequivocal conclusion flows from this reality: the increasingly national character of the CAFO industry necessitates a change in Texas compliance rules and practice.

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121 Philip Brasher, *Troubles Mount for Iowa Firm as Recall Expands*, Des Moines Reg., Aug. 20, 2010, http://www.usatoday.com/yourlife/food/safety/2010-08-19-salmonella-Iowa-firm_N.htm.

122 Gardiner Harris, *Egg Producer Says His Business Grew Too Quickly*, N.Y. Times, Sep. 22, 2010, http://www.nytimes.com/2010/09/23/business/23eggs.html.

123 *Id.*

124 *Id.*; *see also* Alec MacGillis, *Before Salmonella Outbreak, Egg Firm Had Long Record of Violations*, Wash. Post, Aug. 22, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/08/21/AR2010082102822.html.

125 *Public Health and Livestock Confinements: Identifying Threats to Human Health*, Plains Justice, http://plainsjustice.org/files/PublicHealthandCAFOs.pdf (last visited Oct. 16, 2011).

126 Sierra Club & Consumers Union, *Report:Texas No. 1 in Livestock Waste Pollution* (May 18, 2000) (on file with authors) *available at* http://consumersunion.org/other/cafoprsw500.htm (summarizing joint report performed by Consumer Reports and Sierra Club regarding CAFO regulation practices in Texas).

TCEQ records reflect that a number of the top national and international meat-processing corporations own and operate CAFOs under the Texas general permit and commenced their operations here with an "average by default" rating: "insufficient information from which to formulate a rating," as the rules state. Examples include: Seaboard Farms, Premium Standard, Tyson, Cargill, Nippon Meatpackers, and Swift/ConAgra.[127] As the Texas compliance rules are written, out-of-state environmental performance exists in limbo: TCEQ must consider it, but cannot do anything because of it. As written: (1) the compliance history rules require the consideration of "persons," not just "facilities;" (2) a corporate "person" that applies to operate a CAFO may well be an out-of-state corporation, as the above examples demonstrate; (3) the compliance history rules explicitly require TCEQ to consider civil judgments, consent decrees, criminal convictions, and similar adjudications against the "person" for environmental violations; but, (4) a compliance performance rating for a person can include only in-state violations.[128]

D. A Modest Proposal: Scrutinizing Out-of-State Applicants

The opportunity to eliminate this contradiction will soon be forthcoming in TCEQ's rulemaking response to the changes made by the Sunset legislation to compliance history requirements. Drafting rules to more accurately assess a corporation's compliance history—whether in-state or out-of-state—would be a complicated business, one that would involve some method of consultation with other state environmental agencies and EPA to account for corporations that operate dozens of CAFOs in scores of states. However challenging, such a revision in the rules is imperative. With regard to out-of-state corporations with outlandish water-quality violations at their existing facilities, one cannot imagine a worse rule than simply to designate them as unclassified by default. Credit rating companies would cringe. Texas needs rule amendments on this issue.

Some immediate objections to expanding the compliance history rules do not prove insurmountable. First, one wonders whether Texas can deny a permit application, require an individual rather than general permit, or impose permit conditions based on environmental violations and legal judgments in other states. An important distinction is in order here. If a company enters a consent decree with an environmental agency in another state for illegal water discharges, Texas obviously has no jurisdiction over that violation, or the enforcement action, or the subsequent judgment. This should not affect Texas' ability to use out-of-state courts' judgments for environmental violations when Texas makes in-state permitting decisions. Especially with respect to a delegated program, Texas should be able to adopt rules to protect water quality that take into account the prior out-of-state performance of a corporation. TCEQ would not be relying on the out-of-state court's judgment, but the information the case re-

127 Tex. Comm'n on Envtl. Quality, TCEQ Commissioners' Integrated Database, http://www10.tceq.state.tx.us/epic/CCD/ (last modified Sep. 24, 2009) (providing a database to search registered permits).

128 30 TEX. ADMIN. CODE § 60.2(f) (2011) (Tex. Comm'n on Envtl. Quality, Compliance History) (requiring Executive Director to assign a classification to a "person" by averaging the site ratings of all the sites owned or operated by that person in the State of Texas).

veals about the corporation's practices. The corporations that produce beef, pork, and poultry in CAFOs are national, integrated with their suppliers, often merged with each other and subsidiaries. Under these circumstances, how can a state like Texas identify CAFO facilities legally affiliated with an applicant that wants to operate a facility in Texas? This is a critical question that exceeds the scope of this article, but a few observations are in order. The familiar non-answer actually applies here: TCEQ would evaluate CAFO applicants on a case-by-case basis. The relationship between the applicant for a Texas permit and a parent corporation or other entities would be the first in a series of fact-specific questions. First, the compliance histories of all the facilities a corporation owns, if similar in size and function to a proposed facility, should be evaluated.

When an out-of-state corporation applies to construct and/or operate a CAFO in Texas, TCEQ should investigate the other facilities the company operates and with which it contracts to produce its meat products by using ECHO and similar state CAFO databases, as well as PACER for federal judgments. TCEQ should then ask whether there have been discharges at other facilities similar to the one that would be constructed in Texas, and ask what measures the company has taken to remedy the defects at the other facilities. Second, Texas should amend or eliminate § 60.2(f) of TCEQ's compliance history rules, which defines a "person's" compliance rating as the average of the compliance ratings for that person' CAFOs located within the state.[129] This provision is unworkable for national corporations with tens or hundreds of CAFO facilities throughout the country: averaging compliance histories would dilute even the most enormous violations at a few sites. Without question, devising workable rules that would take into account CAFO compliance out-of-state would be a complex process. Whatever form those revised rules took, however, the "averaging" provision will not work for multistate companies. Beyond violations of a certain magnitude, the owner of a facility should not benefit from the fact that it owns scores of others. The importance of taking a qualitative approach to compliance history would be critical. For example, the permitting authority should consider whether major violations have resulted from types of facilities or management practices the corporation requires of its own facilities, or facilities with whom it contracts.

But the problems with § 60.2(f) of TCEQ's compliance history rules do not end with averaging compliance histories. By directing TCEQ to average only those compliance histories an owner might have within Texas, the rule contradicts § 60.1(c)(3), which directs TCEQ to consider judgments, convictions, consent decrees, and similar court judgments from out-of-state that relate to the person's environmental compliance.[130] As already discussed, TCEQ grants out-of-state applicants an "average by default" rating without regard to the applicant's history in other states.

Third, TCEQ should consider the full range of options available to it when an out-of-state applicant has demonstrated significant environmental violations out-of-state, including refusal to issue the permit. Short of this, TCEQ could require a facility to obtain an individual permit at the outset that includes protections tailored to that corporation's past violations. This is the measure EPA contemplated in its discus-

129 *Id.* § 60.2(f).
130 *Id.* § 61(c)(3).

sion of compliance history on the state level, as the Federal Register excerpt already cited demonstrates.

The application for coverage under the general CAFO permit does not require any information on out-of-state violations, despite the rule to the contrary.[131] TCEQ maintains no files on out-of-state applicants or their compliance information upon applying for a facility in Texas. TCEQ has never required an individual permit from an out-of-state applicant on the basis of compliance history. TCEQ has never sought a memorandum of understanding with other states or EPA concerning the exchange or use of compliance history information. TCEQ automatically assigns an "average by default" classification to out-of-state applicants. In short, out-of-state applicants have no history whatsoever, even if they or their parent corporations have paid $7.5 million for massive water-quality violations in another state. The out-of-state applicant who applies for a permit to operate a CAFO goes to Texas with the same assurance as his distant pioneer forbearers: that the state will turn a blind eye to his credit history in his home state. The contemporary settler differs only in the sense that it is a corporation and its environmental compliance history, rather than its credit history, may be disastrous.

V. CONCLUSION

This article started with the premise that compliance history is valuable to the extent that it actually furthers the CWA's objective "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Properly designed, a state's system of documenting compliance history and method of using it in permitting decisions could in fact serve these purposes. The question remains whether the use of compliance history can actually help us improve the Nation's waters.

Above all, one must recognize that the trend in the meat-production industry is toward fewer and larger corporations that vertically integrate with livestock producers when they do not actually run CAFOs under their own corporate name. One must also recognize that the trend toward more animals in less space translates into a greater capacity for contaminants in the meat, greater air pollution, and greater wastewater runoff. Because the environmental problems with CAFOs appear to be increasing, the need to devise more effective regulation becomes paramount.

Game theory offers lessons that suggest the necessity of compliance history information in permitting decisions.[132] When a party must decide how to maximize his advantage in a single transaction—"one-shot"—he and his opponent must decide whether to cooperate with each other or pursue individual advantage. In a "one-shot" transaction, game theory dictates that individual advantage is the superior choice. If the game involves the same choice of self-interest or cooperation but a series of transactions is involved, the considerations change. The party can adopt a number of approaches: always cooperate, always act out of self-interest, or choose each round what the strategy will be that time. After extensive studies with a whole range of human temperaments

131 *See* Tex. Comm'n on Envtl. Quality, *General Permit to Discharge Wastes, General Permit No. TXG920000*, (2009), *available at* http://www.tceq.texas.gov/assets/public/permitting/waterquality/attachments/general/txg920000.pdf.

132 WILLIAM POUNDSTONE, THE PRISONER'S DILEMMA 239–249 (Doubleday 1992).

as well as with computers, researchers found a strategy that alternates the choices of cooperation and self-interest in response to the opponent's decision in the prior round produces the best result. By having information about the opponent's past behavior, one can formulate a decision that produces the best result. It makes sense to cooperate now in order to secure cooperation in the future, but it also makes sense to defect from cooperation and act in self-interest if the opponent provokes this response by his behavior in the previous round. This is a simplified account of the "iterated prisoner's dilemma" game. The creator of this game and the man who discovered the optimal strategy for winning it, Robert Axelrod, described the game as trying to ascertain "the shadow of the future." [133]

When an out-of-state corporation applies for a permit to operate a CAFO in Texas, TCEQ becomes the player in a game involving repeat transactions. In the very first round of the game—the decision whether to grant the corporation a permit—TCEQ needs information about its "opponent" that indicates whether it will cooperate or "defect." There is no information that will actually predict what strategy the corporation will choose later. The same is true in the iterated prisoner's dilemma: one can only seek "the shadow of the future" by observing the opponent's actions in prior rounds. Here is where TCEQ makes a crucial mistake: by assigning an "average by default" rating to any out-of -state applicant—asking no questions whatsoever about other facilities run by the same corporation—TCEQ chooses the "cooperate" strategy on the basis of no information at all.

Every "round of the game" from that point on—each time the facility violates the law—will involve the same problem. TCEQ conducts the investigation, issues the notice of violation, and pursues the administrative or judicial order against the facility. But then TCEQ takes that information and translates it into a form that provides it with inaccurate, or at least inadequate, information in the next round: the performance rating. The decision to ignore compliance history altogether when a corporation applies from out of state, coupled with the decision to apply rules that make it difficult to use compliance history information in future rounds of the game, hamper TCEQ's ability to enforce the law. The better the compliance history system, the more accurate TCEQ's knowledge of the regulated entity can be and the more effective its responses to violations.

This essay discussed a national meat-producing corporation that committed significant violations in the other states where they operate. One may notice that—on the basis of violations reviewed for this article, at least—these were not the corporations whose facilities committed the most serious in-state violations. This observation suggests that compliance history has little predictive value and therefore plays little role in furthering the CWA's purposes. There are several preliminary responses. First, the gambler's fallacy should not form the basis of our environmental policy. Second, TCEQ's records are vast and the information presented here is incomplete, even if acquired with help from TCEQ's CAFO and compliance specialists. Third, the number of national meat-processing organizations that operate CAFO facilities under their

133 *Id.* at 236.

own name does not take into account the vertically-integrated producers that operate according to the national company's guidelines.[134]

Studies exist, however, that suggest past environmental violations can help predict regulatory compliance in later years. One study performed a rigorous statistical analysis of the most prominent corporate environmental rating system used to make socially responsible investments. The study analyzed the rating system devised by Kinder, Lydenberg, and Domini Research and Analytics (KLD).[135] That rating system contains a section that expresses concerns about the pollution records of certain companies, evaluates what factors may have contributed to the violations, and suggests future behavior that may result from past actions.[136] The study evaluating the KLD rating system concluded that it provides a small but statistically significant predictor of future environmental violations.[137]

Whether with regard to a Texas or an out-of-state corporation, compliance history is a necessary but not sufficient condition. Although it does not serve as a perfect predictor of future violations or a perfect means of formulating deterrents, without evaluating compliance history side-by-side with a current decision, TCEQ blinds itself to potentially useful information.

Whether individuals differ concerning the utility of compliance history, the need to document compliance history and use it in regulating potential polluters arises from a legal duty. Federal law assumes the need to make current permit-related decisions in light of risks of future wastewater discharges in the future. *Waterkeeper Alliance* and the federal CAFO rules require facilities to seek permits if they have discharged wastewater in the past or have a potential to discharge in the future based on the facility's design or management. The Texas Water Code imposes a non-discretionary duty on TCEQ to consider compliance history and spells out the basic framework within which TCEQ must work.

The rules TCEQ has enacted to carry out the legislature's mandates, however, diminish the value of compliance as a regulatory tool. The contradiction that TCEQ must consider out-of-state judgments but only factor Texas judgments into the compliance rating renders out-of-state information virtually useless. The rules should be amended to eliminate this contradiction and new rules should be devised that would enable TCEQ to gather information on administrative, civil, and criminal judgments from other states. No memoranda of understanding with other states, databases, or other rule provisions currently exist on this issue. As these rules serve to restore and maintain the integrity of the Nation's waters, TCEQ should amend them to make them more effective when a corporation applies to operate a CAFO in Texas and when any CAFO, once permitted, violates the law.

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134 Karla A. Raettig, *Improvements Needed in Permitting CAFOs Under the Clean Water Act*, Environmental Integrity Project (Sep. 28, 2007) http://www.environmentalintegrity.org/pdf/publications/NPDES_permitting.pdf.

135 Aaron K. Chatterji et al., *How Well Do Social Ratings Actually Measure Corporate Responsibility?*, 18 J. ECON. & MGMT. STRATEGY 125, 126–29 (2009) (summarizing Kinder, Lydenberg, and Domini rating system).

136 *Id.*

137 *See id.* at 129–40.

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Greening the Law of Advertising: Prospects and Problems

by Neil Gormley

> *"Advertising is based on one thing: happiness. And do you know what happiness is? Happiness is the smell of a new car. It's freedom from fear. It's a billboard on the side of a road that screams with reassurance that whatever you're doing is OK. You are OK."*
> — Don Draper[1]

I. Introduction

Mass-media advertising has endured fierce criticism for as long as it has occupied a prominent position in the American economy and society. In 1964, the pioneering media theorist Marshall McLuhan identified the aim of advertising as bringing "all human impulses and aspirations and endeavors" into "programmed harmony" with economic production[2] and likened the subversion of critical faculties by the advertised image to a form of hypnosis.[3] Others have criticized advertising as causing individual

1 *Mad Men* (AMC television broadcast July 19, 2007).
2 Understanding Media: The Extensions of Man 227 (1964).
3 *Id.* at 231.

disempowerment;[4] the crowding out of culture and politics;[5] and even the "continuous, systematic, ruthless destruction of elements of permanence essential to cultural activity."[6] In this article, I consider the possibility that these cultural critics were on to something, but offer a different criticism. I suggest that advertising as practiced in the United States today unnecessarily exacerbates harm to the environment from human consumptive activity. And I ask whether anything can be done about it under the law.

In legal and economic theory, advertising is the "dissemination of information as to who is producing and selling what product, for what reason, and at what price."[7] It functions primarily to provide consumers with useful information and to increase the efficiency of markets. But the practice of advertising departs dramatically from this theoretical construct. In this article, I formulate and assess several reforms of the law of advertising that might incentivize advertisers to do in practice what they do in theory: enable welfare-maximizing consumer choices.

This article's larger objective is environmental. Abundant evidence suggests that current levels of human consumption exceed the limits of environmental sustainability, even as population and rates of consumption continue to grow. One prominent accounting of global sustainability indicates that humankind annually uses 150% of the planet's yield of renewable resources and capacity for absorbing pollution.[8] The implication is that current consumption borrows against the long-term health of natural systems. Improving consumer choices through advertising reform could facilitate reductions in environmentally harmful consumption, by enabling the satisfaction of more human needs with the same inputs.

Ultimately, the value of the reforms considered in this article does not depend on dire estimates of environmental degradation. It is enough that the costs of pollution and resource depletion are real and significant, and that the possibility of running up against hard environmental constraints in the future is worth planning for. Accepting those two propositions, I proceed on an assumption that strikes me as uncontroversial: reducing the pollution and resource depletion associated with future increases in consumers' material well-being is a worthwhile goal.

Of course, all forms of environmental regulation can be viewed as efforts to achieve the very same goal. But the regulation of advertising in service of the environment would differ in an important respect from most existing environmental regulation: it would seek to influence economic activity through the decisions of consumers, not of producers. Existing regulatory regimes focus overwhelmingly on the supply side of economic transactions; few efforts—eco-labeling and smart electricity metering stand out as exceptions—have been made to intervene on the demand side in pursuit of sustainability. The virgin territory of demand-side interventions holds out a promise of

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4 CHRISTOPHER LASCH, THE CULTURE OF NARCISSISM (1991); Neil Postman, Informing Ourselves to Death, Address to the German Informatics Society in Stuttgart (Oct. 11, 1990) ("[F]or the average person, information no longer has any relation to the solution of problems.").

5 GEORG FRANCK, ÖKONOMIE DER AUFMERKSAMKEIT EIN ENTWURF 1 (1998).

6 HAROLD INNIS, CHANGING CONCEPTS OF TIME 11 (2004).

7 Va. State Bd. of Pharmacy v. Va. Citizens Consumer Council, Inc., 425 U.S. 748, 765 (1976).

8 BRAD EWING ET AL., GLOBAL FOOTPRINT NETWORK, CALCULATION METHODOLOGY FOR THE NATIONAL FOOTPRINT ACCOUNTS, 2010 EDITION 1 (2010), *available at* http://www.footprintnetwork.org/images/uploads/National_Footprint_Accounts_Method_Paper_2010.pdf.

low-hanging fruit—valuable opportunities to reduce harm to the environment at little or no cost to human welfare.

The paucity of efforts to intervene on the demand side has much to do with the dominance of the legal theoretic paradigm of law and economics. Consistent with the bedrock notion of revealed preferences in economics, the law assumes that consumption patterns reflect a rational pursuit of fixed preferences by individuals. Under this view, any effort to alter the purchasing decisions of consumers for the purpose of limiting environmental externalities will generate off-setting costs in individual welfare. It follows from these assumptions that the most efficient regulatory interventions are typically found nearer to the point of production.

Rather than hew to those assumptions, this article seeks to identify important ways in which the rational actor model fails to capture the reality of advertising and consumption. In so doing, it draws upon the lessons of behavioral law and economics, a field that seeks to incorporate into the fabric of the law the growing scientific awareness of the ways in which humans depart from the ideal of the rational actor.[9] In that respect, this article responds to a need identified twelve years ago by Jon Hanson and Douglas Kysar: "Any legal concept that relies in some sense on a notion of reasonableness or that is premised on the existence of a reasonable or rational decision maker will need to be reassessed in light of the mounting evidence that a human is a reasoning rather than a reasonable animal."[10]

The argument that advertising law should be enlisted in the effort to reconcile economic activity and environmental quality must clear several hurdles, both conceptual and legal. This article proceeds in three parts. Part I describes the links between advertising, consumption, and environmental harm and identifies the contribution that improvements in the efficiency of retail markets can make to environmental sustainability. Part II discusses several possible reforms aimed at enhancing the informational content of advertising, reducing its tendency to subvert rational consumer decision making, and encouraging environmentally superior choices. Part III evaluates the consistency of these possible reforms with the First Amendment's protection of commercial speech and argues for a broad interpretation of the exception for false, deceptive, and misleading advertisements. Nevertheless, I conclude that several valuable regulatory approaches will be off-limits as long as courts persist in zealous protection of commercial speech.

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9 *See* Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1476–80 (1998) (characterizing real people as distinct from ideal rational actors, as having "bounded rationality, bounded will power, and bounded self-interest").

10 Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: The Problem of Market Manipulation*, 74 N.Y.U. L. REV. 630, 634–35 (1999) (citation omitted). In the intervening years, Jon Hanson has come to view *both* law & economics and behavioral law & economics as products of an inadequate "dispositionist" paradigm in which human behavior is "strongly presumed to reflect freely willed, preference-satisfying individual choice," without sufficient regard for the powerful influence of "situational" forces. *See* Jon D. Hanson & David Yosifon, *The Situational Character: A Critical Realist Perspective on the Human Animal*, 93 GEO. L.J. 1, 8 (2004). My approach is more behavioralist than situationist. Because I offer concrete proposals for reforming advertising law, I am constrained by the practical need to meet existing doctrinal structures half-way.

II. ADVERTISING AND THE ENVIRONMENT

A. ECOLOGICAL ECONOMICS

The phenomenon of diminishing returns to scale is a bedrock of the discipline of economics. In microeconomics, every enterprise has an optimal scale beyond which it is *uneconomic* to grow further, because marginal costs outweigh marginal benefits. And yet, in what ecological economist Herman Daly has termed the "glittering anomaly," orthodox economics refuses to recognize that the aggregate human economy might have an optimal scale.[11] Rather than treat the human economy as a subsystem of the larger biophysical system of the Earth, economic theory treats the human economy as the whole.[12] Pollution and depletion are relegated to the theoretical hinterland through the notion of "externalities." Growth of gross domestic product (GDP) is assumed to be an unambiguous good. Indeed, growth is treated as a near panacea that will provide humankind with the resources and wisdom to attend to the ills of the larger system—the environment.[13] Ecological economics, by contrast, urges that the environmental costs of additional growth of the human economy are real, substantial, and increasing. Its practitioners insist that there is a limit beyond which these environmental costs—to humans—become greater than the material benefits—again, to humans—of additional growth.[14]

The signs are all around us that we are approaching, or perhaps already surpassing, that optimum. The situation has been ably summarized elsewhere,[15] but a few statistics help put the problem in perspective. Natural habitats are being destroyed at an accelerating pace. Fifty percent of all temperate grasslands and forests have already disappeared.[16] More than 16,000 known species face extinction, and as many as 12,000 species unknown to science become extinct each year.[17] At current rates, a significant fraction of existing species will disappear by mid-century.[18] The vast majority of the oceans' valuable fisheries have collapsed or are in sharp decline.[19] The soil of croplands is being carted away by erosive forces approximately ten to forty times faster than rates of soil formation, and erosion on cropland outstrips the erosion that occurs

11 HERMAN R. DALY, BEYOND GROWTH: THE ECONOMICS OF SUSTAINABLE DEVELOPMENT 60 (1996).

12 *See id.* at 6.

13 *E.g.*, John Tierney, *The Richer-Is-Greener Curve*, N.Y. TIMES (Apr. 20, 2009), http://tierneylab.blogs.nytimes.com/2009/04/20/the-richer-is-greener-curve.

14 *See, e.g.*, Earl Cook, *The Consumer as Creator: A Criticism of Faith in Limitless Ingenuity*, *in* ENERGY EXPLORATION AND EXPLOITATION, 194 (1982).

15 *E.g.*, PETER A. VICTOR, MANAGING WITHOUT GROWTH: SLOWER BY DESIGN, NOT DISASTER (2008); DONELLA H. MEADOWS ET AL., LIMITS TO GROWTH: THE 30-YEAR UPDATE (2004).

16 David Biello, *All Consuming*, MOMENTUM, Summer 2010, at 14, *available at* http://environment.umn.edu/momentum/images/images_2.3s10/momentum_summer10_pages_lowres.pdf.

17 *Id.*

18 JARED DIAMOND, COLLAPSE: HOW SOCIETIES CHOOSE TO FAIL OR SUCCEED 488 (2005).

19 *Id.*

in forested soils by a factor of at least 500.[20] Freshwater, upon which so much life depends, is being consumed far faster than it can be replenished.[21]

One aspect of our current trajectory is quite unmistakably unsustainable—carbon pollution. Greenhouse gas concentrations in the atmosphere are already increasing average temperature and altering the climate in drastic and unpredictable ways. Keeping atmospheric concentrations of carbon dioxide below 450 parts-per-million—the level at which the Intergovernmental Panel on Climate Change estimates a 50% chance of avoiding a dangerous temperature increase of 2.1 degrees Celsius[22]—presents humankind with a massive technological and industrial challenge, even if total world energy consumption remains at current levels.[23] Given the near certainty of future increases in the energy consumed by developing economies, it is difficult to escape the conclusion that consumers in the developed world will have to cut back.

Numerous efforts have been made in recent years to assess empirically the sustainability of the aggregate human economy. One of these efforts is the Ecological Footprint, an environmental accounting method that compares annual resource consumption worldwide against the planet's annual productive capacity for fisheries, cropland, grazing land, wood products, shelter, and carbon sequestration.[24] A recent comprehensive accounting using the Ecological Footprint method, indicates that humankind arrogates to itself approximately 150% of the planet's sustainable capacity.[25]

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20 *Id.* at 489.

21 *Id.* at 490.

22 Tariel Mórrígan, *Target Atmospheric Greenhouse Gas Concentrations: Why Humanity Should Aim for 350 ppm CO2e* 4 (2010), *available at* http://www.global.ucsb.edu/climateproject/papers/pdf/Morrigan_2010_Target%20Atmospheric%20GHG%20Concentrations.pdf (citing Susan Solomon et al., Climate Change 2007: The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (2007)).

23 *See* Saul Griffith, Climate Change Recalculated, Address to the Long Now Foundation (Jan. 16, 2009), *available at* http://fora.tv/fora/fora_transcript_pdf.php?cid=8907.

24 *See* Ewing et al., *supra* note 8.

25 *Id.* at 12. Like all accounting regimes, the ecological footprint is vulnerable to criticism for failing to capture aspects of the problem that it is not designed to measure. The ecological footprint uses the global hectare—a standardized unit of measurement equal to one hectare with global average productivity—to represent both consumption and productive capacity. Utilization of a common unit of measurement allows aggregation and comparison across resource types and countries, but obscures some ecological costs. For example, the growth of intensive monoculture production methods appears as an unvarnished good in ecological-footprint accounts.

Many critics have charged that the ecological footprint has an anti-trade bias because it assigns a large footprint to dense or highly urban national or subnational units that must import food and other resources. *E.g.*, Jeroen Van Den Burgh & Fabio Grazi, *On the Policy Relevance of Ecological Footprints*, 44 Envtl. Sci. & Tech. 4843, 4844 (2010). Whatever the validity of this criticism, it is inapplicable when one uses the ecological footprint, as I do here, as "an indicator of instantaneous non-sustainability at the worldwide level." Joseph E. Stiglitz et al., Report by the Commission on the Measurement of Economic Performance and Social Progress 71 (2009), *available at* http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf.

Another measure of the aggregate impact of human consumption, called Human Appropriation of Net Primary Production (HANPP), reinforces the conclusions drawn from studies that use the Ecological Footprint methodology. In a groundbreaking 1986 study, Vitousek et al. estimated that humans appropriate 25% of the total photosynthetic production of the Earth's plants, minus the energy used by the same plants to grow and reproduce.[26] In the past twenty years, numerous authors have revisited, and largely validated, the Vitousek et al. result.[27] More to the point, when only *terrestrial* net primary production is considered, the proportion used by humans rises to 40%.[28] HANPP has been shown to be "a major indicator of human pressures on ecosystems."[29] Many ecosystems may be unable to weather a single doubling of HANPP—a doubling which, at current rates, will almost certainly occur.[30]

What is to be done? Humankind, though off to a slow start, is already adopting a range of strategies. Take three, merely illustrative, examples:

- Sustainable forestry operations aim to produce timber while minimizing the long-term negative effects on local ecosystems.
- The green revolution in agriculture promises increased yields of hemp per acre from genetically enhanced seeds.
- Consumers seek out simple, well-made furniture.

These can all be viewed as efforts to maximize the services that consumers obtain from goods per unit of *throughput*, the term that ecological economist Herman Daly uses to refer to the flow of raw material inputs into the human economy, followed by

26 Peter M. Vitousek et al., *Human Appropriation of the Products of Photosynthesis*, 36 BIOSCIENCE 368 (1986).

27 Subsequent efforts have yielded conclusions that are broadly consistent with the Vitousek results, but changes in definitions and assumptions complicate comparison between the studies, such that few conclusions can be drawn about changes in HANPP since the 1970s. Helmut Haberl et al., *Global Human Appropriation of Net Primary Production (HANPP)*, THE ENCYCLOPEDIA OF EARTH (Apr. 29, 2010), http://www.eoearth.org/article/Global_human_appropriation_of_net_primary_production_(HANPP); *Id.* ("[D]ifferences resulting from the use of different definitions were by far larger than differences resulting from uncertainties in the data.").

28 DALY, *supra* note 11, at 57.

29 Haberl et al., *supra* note 27.

30 While population growth seems unquestionably to be leveling off, it has a long way to go before it peaks. The United Nations Population Fund estimates that the world population will continue rising until approximately 2300. By 2050, there will be 9 billion people on Earth, a near doubling of the 1990 level of 5.2 billion. *See World Population Prospects: The 2008 Revision*, POPULATION NEWSLETTER 1 (U.N. Dep't of Econ. and Soc. Affairs, New York, N.Y.), June 2009, at 1, *available at* http://www.un.org/esa/population/publications/popnews/Newsltr_87.pdf. But the greater cause for concern is the steady increase in *per capita* resource consumption. While the human population only doubled between 1950 and 1990, water use tripled, fish consumption grew 4.4-fold, and energy use quintupled. W.H. Corson, *Changing Course: An Outline of Strategies for a Sustainable Future*, 26 FUTURES: THE JOURNAL OF FORECASTING AND PLANNING 206, 206 (1994). For China to increase its per capita resource consumption to current first-world levels will imply an *eleven*-fold per capita increase. Jared Diamond, *What's Your Consumption Factor?*, N.Y. TIMES (Jan. 2, 2008), http://www.nytimes.com/2008/01/02/opinion/02diamond.html.

their conversion into commodities, and finally into waste outputs.[31] It is this flow, this throughput, that must remain within the regenerative and absorptive capacities of the ecosystem for the human economy to avoid straying beyond its optimal scale.

Daly expresses this idea in three ratios:[32]

$$\frac{service}{throughput} = \frac{service}{stock} \times \frac{stock}{throughput}$$

Therefore, we optimize the economy by maximizing the services that we get from a given capital stock, and maximizing the capital stock that we can produce and maintain at a level of throughput that is sustainable in perpetuity.

Daly further disaggregates these concepts:[33]

$$\frac{services}{\substack{NK\ services \\ sacrificed}} = \frac{services\ from\ MMK}{stock} \times \frac{stock\ of\ MMK}{throughput} \times \frac{throughput}{stock\ of\ NK} \times \frac{stock\ of\ NK}{\substack{NK\ services \\ sacrificed}}$$

Returning to the three environmentally conscious adaptations mentioned earlier we can see that each is an effort to improve one of Daly's ratios. The switch to durable furniture increases the services gained from each item (a Mission-style chair, say) over its usable lifetime, while the simplicity of the design increases the quantity of chairs produced per throughput. Genetically modified crops increase the throughput of hemp available to weave the seat of the chair per acre of arable land (natural capital) put under cultivation. And sustainable forestry practices limit the loss of ecosystem services when forests are converted into usable natural capital. In this more precise formulation, the goal of economics ought to be to maximize the services gained from the stock of man-made capital per unit of natural capital service sacrificed. Thus, in this context, Daly would urge that policymakers should aim to maximize chair-hours while minimizing the loss of hydrologic and other services from the forests that provide the timber.

Notable though Daly is for his willingness to challenge several core orthodoxies of his discipline, these equations reveal that there is another economic orthodoxy that the iconoclast leaves intact: the consumer as rational actor. The ultimate maximand in Daly's equations is total services derived from man-made capital—not utility, happiness, or any other stand-in for subjective welfare. Daly understands "the causal connections between economic growth, increases in personal consumption, and increasing environmental damage."[34] But he assumes the same causal connections between increases in personal consumption (or at least in the services derived from the goods consumed) and welfare.[35] And Daly has been explicit about this, referring to the ser-

31 DALY, *supra* note 11, at 28.

32 *Id.* at 69.

33 *Id.* at 84. NK = natural capital; MMK = man-made capital.

34 D. GOLDBLATT, SOCIAL THEORY AND THE ENVIRONMENT 43 (1996).

35 *See* DALY, *supra* note 11, at 68 ("[I]t is the capital stock from which we derive satisfaction, not from the additions to it (production) or the subtractions from it (consumption)." (quoting Kenneth Boulding, *Income or Welfare?*, 17 REV. OF ECON. STUD. 77, at 79 (1949))). Thus, Daly

vice efficiency of man-made capital stock as a function of "resource allocation among the different product uses in conformity with individual preferences and ability to pay."[36] The ultimate economic good is that people get the services for which they pay, at minimal cost to the environment.

We should be willing to go further. A more complete formulation of the task of bringing the human economy in line with natural constraints requires the addition of another ratio to Daly's equation: the welfare generated by services from man-made capital, per service from man-made capital consumed, must also be maximized. That is, the ecologically efficient society must work to ensure that scarce man-made capital is put to uses that actually enhance human welfare. If achieving environmental sustainability requires reductions in environmental throughput, either now or in the future, gains in the efficiency of consumer choice can offset the welfare losses that reductions in throughput would otherwise produce.[37]

Advertising law may have a role to play in securing these efficiency gains. Our Mission-style chair example can illustrate the basic mechanism. If an advertisement provides people with information they did not have before—for example, if they did not realize they could afford a Mission-style chair, or were unfamiliar with its unique benefits—then the advertisement may have facilitated a welfare-enhancing transaction. If, on the other hand, people who purchase Mission-style chairs because of advertisements would have been equally happy sitting on whatever they had before or on another chair that was advertised poorly—if the advertisement worked, for example, by fooling them or appealing to a fleeting emotion—then the scarce resources sacrificed to make the Mission-style chair were largely wasted.[38] The questions therefore become: Are advertisements primarily informational? Do they improve consumer choice? And if not, what, if anything, can be done to require advertisements to improve consumer choice?

B. The Effects of Advertising

The lesson of ecological economics, then, is that to optimize the human economy we must maximize the ratio of welfare to throughput. There are at least three reasons to suspect that commercial advertising, as currently practiced, frustrates that goal. First, advertising may drive consumers to make suboptimal choices between competing goods and services. Second, it may increase aggregate consumption beyond optimal

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recognized that planned obsolescence, for example, was a thing to be avoided. But Daly does not inquire whether the uses of the capital stock in which people pay to engage are actually providing as much satisfaction as widely believed.

36 *Id.* at 84.

37 Another promising approach is taking steps to deal with income inequality. If the welfare value of consumption demonstrates rapidly diminishing returns, then redistribution of income would also be likely to increase the welfare that is attainable for a given man-made capital stock. That inquiry, however, is beyond the scope of this article.

38 Admittedly, people may occasionally be fooled into buying things that nevertheless increase their welfare. But the relevant question is about the opportunity cost of the purchase: Was there a better use of those scarce ecological resources? It seems clear that the economy that allocates based on rational, informed choice will, on average across an entire economy, produce more welfare per throughput.

levels. And, finally, the substantial resources that our economy devotes to the activity of advertising itself may be largely wasted. I consider each possibility in turn.

1. Advertising Alters Consumer Choices

Advertising may alter consumer choices in ways that frustrate the goal of maximizing welfare for a given level of environmental impact in two ways. It may drive consumers to spend their limited income on goods and services that they would not otherwise purchase, leaving authentic needs unmet. Or it may induce consumers faced with a choice between substitutes to choose the environmentally inferior alternative.

While some are skeptical of the impact of commercial advertising,[39] its persistence in a market economy is strong evidence of its effectiveness in altering consumer decisions. Businesses devote over $200 billion to advertising every year in the United States.[40] From this we may deduce either that sellers are profoundly deceived about the effectiveness of advertising, or that advertising alters consumer behavior.

The first option is easily dismissed. The empirical evidence of the effects of marketing on consumer choice is impressive. One study measured the effect of advertising on investors' choices from a menu of investment portfolios offered by the Government of Sweden, finding that portfolio advertising had a robust effect.[41]

As one meta-study summarized:

> Studies conducted over the past three decades demonstrate that advertising works. It works across media. It works for consumer products as well as industrial ones. It works for new products as well as established products. It works in the short term and continues to work years after the advertising has been run. It even works to help companies through a recession, and it gives those companies a boost after the recession.[42]

Advertising therefore alters consumer choices. Does it do so in ways that help or hinder the goal of maximizing welfare? We can begin to answer that question by framing it somewhat differently. Does advertising work primarily by furnishing consumers with information they lack? Unfortunately, it does not. In the late 1970s, studies indicated that nearly 60% of the assertions in common consumer advertisements were not

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39 *See infra*, text accompanying note 130.

40 Douglas Galbi, *U.S. Advertising Expenditure, 1998-2007*, Purple Motes, http://purplemotes.net/2009/02/16/us-advertising-expenditure-1998-2007/ (Feb. 16, 2009) (citing Robert J. Coen's 2007 estimate of approximately $280 billion and the U.S. Census Bureau's 2007 estimate of $220 billion); *see also Advertising, Marketing Spend to Reach $412.4B in '08; Shift to Company Sites*, MarketingCharts.com (July 15, 2008), http://www.marketingcharts.com/television/advertising-marketing-spend-to-reach-4124b-in-08-shift-to-company-sites-5277/ (citing Outsell Inc.'s 2008 estimate of $249 billion).

41 Henrik Cronqvist, Advertising and Portfolio Choice (2006), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=920693.

42 Peter Kim, *Does Advertising Work: A Review of the Evidence*, 9 J. Consumer Marketing 5, 7–8 (1992); *but cf.* Gordon R. Foxall & Ronald E. Goldsmith, Consumer Psychology for Marketing 114–15 (1994) (discussing the precision of tools used by advertisers to measure the effectiveness of commercial messages in altering product attitudes).

factual, but subjective.[43] The informational content of advertising has declined further since. Persuasive messages that "elicit only emotional responses, omitting virtually all information" have come to dominate professional advertising.[44] Print advertising in *Time* magazine, for example, contained fewer than half as many words in 2000 as in 1976.[45]

There is good reason to think that the effectiveness of advertising is due to its ability to induce irrational responses and not to its provision of factual information. As Hanson and Kysar explain in their extensive survey of cognitive psychology literature, "individuals exhibit systematic and persistent cognitive processes that depart from axioms of rationality."[46] Advertisers are well-acquainted with the biases and heuristics on which consumers rely and with consumers' tendency to be swayed by emotion and vague associations. And advertisers tailor their messages accordingly—just one example of what Hanson and Kysar call "market manipulation."[47]

"Consumer research conducted over the last decade or so suggests strongly that consumers have a very limited capacity for receiving and using information [and] that they do not as a rule undertake rational, comparative evaluations of brands on the basis of their attributes."[48] Consumers routinely believe the nonfactual, nonfalsifiable claims made by advertisers,[49] even though such "puffing" claims are presumed harmless in advertising law.[50]

Emotional processes frequently determine product attitude formation and purchasing decisions in "low involvement situations."[51] For example, the mood that an advertisement produces in recipients has important effects on the way that they process the information and stimuli contained in it.[52] "Individuals in positive moods

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43 *E.g.*, Terence A. Shimp, *Social Psychological (Mis)Representations in Television Advertising*, 13 J. CONS. AFF. 28, 35 (1979).

44 Sarah C. Haan, *The "Persuasion Route" of the Law: Advertising and Legal Persuasion*, 100 COLUM. L. REV. 1281, 1288 (2000); *see also* Yoav Hammer, *Expressions Which Preclude Rational Processing: The Case for Regulating Non-Informational Advertisements*, 27 WHITTIER L. REV. 435, 438–44 (2005) (surveying evidence of the decreasing informational content of advertising).

45 David A. Hoffman, *The Best Puffery Article Ever*, 91 IOWA L. REV. 1395, 1440 (2006) (citing Haan, *supra* note 44 at 1288).

46 Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: Some Evidence of Market Manipulation*, 112 HARV. L. REV. 1420, 1424–25 (1999); *see also* Oren Bar-Gill, *Seduction by Plastic*, 98 NW. U. L. REV. 1373, 1373 (2004) ("[C]ompetitive forces compel sellers to take advantage of consumers' weaknesses.").

47 Hanson & Kysar, *supra* note 46, at 1425.

48 FOXALL & GOLDSMITH, *supra* note 42, at 31.

49 Hoffman, *supra* note 45, at 1435 (quoting Perry Haan & Cal Berkey, *A Study of the Forms of Puffery*, 8 J. MARKETING COMM. 243, 246 (2002)).

50 Jean Wegman Burns, *Confused Jurisprudence: False Advertising Under the Lanham Act*, 79 B.U. L. REV. 807, 868–69 (1999) ("[C]ourts assume that purchasers are not likely to rely on [puffing] statements.").

51 FLEMMING HANSEN & SVERRE RIIS CHRISTENSEN, EMOTIONS, ADVERTISING AND CONSUMER CHOICE 218 (2007) (defining "low involvement situation" as a situation in which "the consumer is not particularly interested in the product in question, the information provided about it, or the overall situation in which the advertising is experienced").

52 *See* Jeremy A. Blumenthal, *Emotional Paternalism*, 35 FLA. ST. U. L. REV. 1 (2007).

tend to process information more superficially or heuristically, tend to rely more on stereotypes, and are more easily persuaded than individuals in negative moods."[53] Furthermore, positive emotions have a pronounced tendency to reduce inhibitions and self-control.[54] Conversely, commercials that arouse fear in the viewer prompt "pessimistic risk estimates and risk-averse choices."[55]

"There is little question that marketers are aware of, and make use of, [both cognitive shortcomings and] emotional influences on consumer behavior."[56] Sarah Haan describes the eight-billion-dollar-a-year enterprise of advertising research:

> Like behavioralists and cognitive psychologists—some of whom author articles that appear in advertising journals—advertising researchers study human decision making shortcuts, or heuristics, and fashion models of human decision making, which they call "persuasion routes." Unlike the cognitive psychologists, however, advertisers act on these models, using them to create advertisements that steer consumers down particular routes to persuasion. By investing millions of dollars in follow-up quantitative research—consumer surveys, focus groups, and retail sales information, much of which is never published—advertisers hone their appeals until they achieve maximum persuasiveness.[57]

These insights form the foundation of the discipline of marketing, exemplified by texts like Pamela Danziger's aptly named how-to guide, *Why People Buy Things They Don't Need*.[58]

There is a strong argument that advertising alters consumers' purchase decisions in ways that frustrate the satisfaction of authentic needs. At the very least, we can conclude that advertising largely fails to provide consumers with the information they need to make intelligent, welfare-maximizing decisions.

What about the goal of minimizing environmental costs? Undoubtedly, there has been an explosion in "green advertising" designed to highlight product attributes that appeal to environmentally conscious consumers.[59] But it is difficult to assess what proportion of green advertising claims is trustworthy and what proportion is so-called "greenwash." Critics charge that sellers "exaggerate or even fabricate the environmental qualities of their goods, letting their advertising rhetoric far outstrip their environmental contributions."[60]

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53 *Id.* at 38.

54 *See id.* at 39.

55 *Id.* at 41. One need only think of the commercials for Brinks Home Security to see the potential for manipulation inherent in advertisements that seek to stimulate fear. (An example is at http://www.youtube.com/watch?v=MeBt2xouWbY.)

56 Blumenthal, *supra* note 52, at 47.

57 Haan, *supra* note 44, at 1282.

58 Pamela N. Danziger, Why People Buy Things They Don't Need: Understanding and Predicting Consumer Behavior (2004).

59 Jessica E. Fliegelman, *The Next Generation of Greenwash: Diminishing Consumer Confusion Through a National Eco-Labeling Program*, 37 Fordham Urb. L.J. 1001, 1003 (2010).

60 Roger D. Wynne, *Defining "Green": Toward Regulation of Environmental Marketing Claims*, 24 U. Mich. J.L. Reform 785, 787 (1991); *see also* TerraChoice Environmental Marketing, *The Sins of*

The jury is still out regarding the contribution that advertising currently makes to reducing the environmental costs of consumption on a per-product basis. It may be that advertising enables some environmentally friendly products to find customers; but not to the extent that it would if advertising claims were more trustworthy and more trusted. What is clear is that advertising law affords no special advantage to environmentally superior products relative to products that appeal to consumers based on other attributes. In Part II, I consider the potential benefits of reforming advertising law to do just that.

2. Advertising Increases Consumption

The second reason why advertising undermines efforts to bring the human economy in line with physical constraints is its promotion of consumption. Though one major effect of advertising is to alter individual purchase decisions—and the impact of this effect on the environment may vary from case to case—advertising also causes purchasing to increase in the aggregate. In this sense, consumer advertising has a clear and pronounced consumerist valence. And these consumerist messages are ubiquitous. Researchers estimate that children in the United States see between 20,000 and 40,000 television commercials each year.[61] Messages promoting nonconsumptive pursuits are conspicuously undersupplied.

As Steven Shiffrin has summarized:

> Living in a society in which children and adults are daily confronted with multiple communications that ask them to purchase products inevitably places emphasis on materialistic values. The authors of the individual messages may not intend that general emphasis, but the whole is greater than the sum of the parts. Even if it were not, the parts add up to a loud materialist chorus.[62]

In other words, the marketplace of ideas,[63] whatever its value as an intellectual construct in other arenas, breaks down when it comes to the choice *whether* (as opposed to *what*) to consume. And there is evidence that the materialist valence of advertising produces real costs in human welfare.[64] But even if material consumption in advanced

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Greenwashing 2010 (2009), *available at* http://sinsofgreenwashing.org/findings/greenwashing-report-2010/.

61 David G. Yosifon, *Resisting Deep Capture: The Commercial Speech Doctrine and Junk-food Advertising to Children*, 39 LOY. L.A. L. REV. 507, 521 (2006).

62 Steven Shiffrin, *The First Amendment and Economic Regulation: Away from a General Theory of the First Amendment*, 78 NW. U. L. REV. 1212, 1281 (1983).

63 *See* Abrams v. United States, 250 U.S. 616 (1919) (Holmes, J., dissenting).

64 *E.g.*, Robert E. Lane, *The Road Not Taken: Friendship, Consumerism, and Happiness*, 8 CRITICAL REV. 521 (1994) (examining the relationship between consumerism and societal depression); John Waide, *The Making of Self and World in Advertising*, 6 J. BUS. ETHICS 73 (1987). At the levels of development that the United States has enjoyed now for some decades, the correlation between consumption and self-reported happiness is tenuous. "Comparing across countries, it is true that income and happiness are positively related and that the marginal utility falls with higher income. Higher income clearly raises happiness in developing countries, while the effect is only small, if it exists at all, in rich countries." Richard A. Easterlin, *Diminishing Marginal Utility of Income? A Caveat*, ((Univ. of S. Cal., Working Paper No. 5, 2004), at 1,

economies is as fulfilling as other human pursuits, a society's choice to privilege that approach to the satisfaction of human needs tremendously complicates the effort to reconcile economic activity with ecological constraints.

3. Advertising Expenditures Are Wasted Resources

The final reason why advertising stands in the way of truly efficient use of nature's resources is that a significant proportion of advertising expenditures are wasted because the messages are ineffectual. At first blush, this argument may appear inconsistent with the others, but there is no contradiction; though evidence that advertising affects consumer decisions is undeniable, it is equally clear that advertising is to some extent self-cancelling. "One of the ironies of advertising in our times is that as commercialism increases, it makes it that much more difficult for any particular advertiser to succeed, hence pushing the advertiser to even greater efforts."[65] Though advertisers work to grow their markets, the potential for growth is not unlimited, so sellers inevitably seek to increase their market share. In industry after industry, each competitor spends lavish sums to draw customers away from others. From this perspective, when advertising moves beyond the provision of basic information and into the realm of persuasion, much of it becomes the deadweight loss of a massive capitalistic collective action problem, probably to the tune of tens of billions of dollars of scarce resources each year.

The foregoing suggests that Americans are poorly served by the current state of advertising. Advertisements alter consumer choice without privileging environmentally superior products, increase total consumption, and cancel each other out. But these criticisms are not all equally compelling. Direct expenditures on advertising pale in comparison to the economic activity that is altered by advertising. Moreover, growth in overall consumption is not inconsistent in principle with the goal of maximizing human welfare for a given level of environmental impact: Additional consumption may still be "economic." Even if it is not, it can in theory become so if consumption patterns are redirected towards greater environmental efficiency. Of the three phenomena surveyed, therefore, the corruption of consumer choice is the most deserving of scrutiny. That will be my focus in the following discussion of advertising law reform.

III. Remaking Advertising Law for Sustainability

A. The Tripartite Regime of Advertising Law

Advertising is governed at present by a tripartite regulatory regime. The Federal Trade Commission (FTC) Act empowers the FTC to police advertisers' "unfair and

(quoting Bruno S. Frey & Alois Stutzer, Happiness and Economics: How the Economy and Institutions Affect Well-Being 90 (2002)); *see also* Richard Easterlin and Laura Angelescu, *Happiness and Growth the World Over*, Time Series Evidence on the Happiness-Income Paradox at 2, IZA Discussion Paper Series (March 2009), *available at* http://ftp.iza.org/dp4060.pdf (responding to recent criticism of the conclusion that time-series data does not reveal any long-term correlation between income and happiness).

65 Robert W. McChesney, The Political Economy of Media: Enduring Issues, Emerging Dilemmas 266 (2008).

deceptive acts [and] practices" through issuance of cease and desist orders and fines.[66] The federal Lanham Act creates a cause of action for businesses injured by the false or misleading statements of their competitors.[67] State common law and consumer protection statutes furnish remedies to injured consumers.[68]

All three sources of law hold advertisers to roughly the same standard.[69] Advertising claims, express and implied, are actionable if materially false or misleading and likely to alter consumers' purchasing decisions.[70] The standard for whether a claim is misleading is objective and guided by the concept of the reasonable consumer.[71] Claims on which a reasonable consumer would not rely in making purchasing decisions—including statements of opinion and other nonfactual claims—are non-actionable "puffery."[72] The good or bad faith of the advertiser is legally irrelevant.[73]

The FTC formerly interpreted its statutory mandate more broadly. In 1964, it promulgated the "cigarette rule," defining an unfair business practice as one that: (1) "is within at least the penumbra of some common-law, statutory, or other established concept of unfairness"; (2) "is immoral, unethical, oppressive, or unscrupulous"; and (3) "causes substantial injury to consumers" (or competitors or other businessmen).[74] This construction of the statute might have been generous enough to encompass advertisements calculated to lead consumers to act irrationally. But under pressure from skeptics in Congress, in the courts, and ultimately at the head of the agency itself, the FTC backed away from this broad reading of its authority.[75] In 1980, it adopted an

66 15 U.S.C. § 45 (2011).

67 Trademark Act of 1946 (Lanham Act) Pub. L. No. 79-489, 60 Stat. 428 (codified at 15 U.S.C. §1125) (2006).

68 *E.g.*, New York State General Business Law § 349; Readco, Inc. v. Marine Midland Bank , 81 F.3d 295, 301 (2d Cir. 1996) (discussing New York state common law governing promissory estoppel); Schlaifer Nance & Co. v. Estate of Andy Warhol, 119 F.3d 91, 98 (2d Cir. 1997) (discussing New York state common law governing fraud).

69 *See* Johnson & Johnson Vision Care, Inc. v. Ciba Vision Corp., 348 F.Supp.2d 165, 177–78 n.6 (S.D.N.Y. 2004) ("[T]he standards for analysis of Plaintiff's New York state law claims are the same as those for analysis of the Lanham Act claims in all relevant respects."). Indeed, several state deceptive advertising statutes direct that courts interpreting them are to be guided by agency and judicial interpretations of the FTC Act. *E.g.*, MASS. GEN. LAWS ANN. 93A § 2(b).

70 *E.g.*, FTC v. Stefanchik, 559 F.3d 924, 928 (9th Cir. 2009) (interpreting the FTC Act); *Johnson & Johnson*, 348 F.Supp.2d at 177–78 (interpreting the Lanham Act); Pelman v. McDonald's Corp., 396 F. Supp. 2d 439 (S.D.N.Y. 2005) (interpreting N.Y. GEN. BUS. L. § 349).

71 *Stefanchik*, 559 F.3d at 928; Coastal Abstract Serv., Inc. v. First Am. Title Ins. Co., 173 F.3d 725, 731 (9th Cir. 1999); Oswego Laborers' Local 214 Pension Fund et al. v. Marine Midland Bank, N.A., 85 N.Y.2d 20 (N.Y. 1995).

72 *See Coastal Abstract*, 173 F.3d at 731 (holding that a claim that a competing title company was too small to render adequate service to a particular customer was nonactionable puffery because too "vague and subjective" to induce reliance). For a comprehensive discussion of the slippery doctrines of puffery, see Hoffman, *supra* note 45.

73 Lefkowitz v. Colo. State Christian College of Church of Inner Power, Inc., 76 Misc.2d 50, 346 N.Y.S.2d 482 (Sup. Ct. N.Y. Co. 1973).

74 Unfair or Deceptive Advertising and Labeling of Cigarettes in Relation to the Health Hazards of Smoking, 29 Fed. Reg. 8324, 8355 (1964).

75 Matthew A. Edwards, *The FTC and the New Paternalism*, 60 ADMIN. L. REV. 323, 343.

enduring interpretation of unfairness requiring that the injury to the consumer be both substantial and not reasonably avoidable.[76] The current FTC interpretation thus takes the paradigmatic rational consumer as its starting point; if a consumer fails to act reasonably in response to an unfair practice, then the practice falls outside of the FTC's authority.[77]

In short, all of these regulatory regimes assume that consumers are rational actors and that advertisers count on consumers' rationality in crafting their messages. Sellers are not to be held responsible for the actions of the rare consumer who makes irrational purchasing decisions. As we have seen, the reality of advertising and consumer behavior is starkly different. Advertising consists primarily of nonfactual, irrational appeals, yet advertising law declines to police those appeals, requiring only that fact-based claims calculated to appeal to rational actors be truthful. Perversely, therefore, the burdens of the current legal regime are reserved exclusively for the advertising messages—factual ones—that we should favor. It is thus not surprising that advertising law largely fails to incentivize the provision of information.

B. Reforming Advertising Law

How can advertising law be enlisted to promote truly welfare-maximizing decisions that minimize the attendant environmental costs? I consider three categories of reforms. I make no claim that they are politically attractive—or even politically feasible—at present, but each responds to the policy goals that I have outlined.

The first way one could reform advertising law to promote consumer choices more conducive to maximizing human welfare per throughput is to confer an advertising advantage on producers of environmentally superior products. If advertising significantly affects consumer attitudes and operates primarily through appeals to irrational cognitive and emotional processes, then regulators can give environmentally superior products a leg up by restricting or dis-incentivizing the advertising of environmentally inferior alternatives. For example, rather than prohibiting the sale of vehicles with low fuel efficiency, government could restrict the advertising of the offending vehicles, securing environmental benefits with far less imposition on consumer choice than in the case of a product ban.[78] Such regulation could reduce the demand for those vehicles among consumers who make their purchase decisions primarily on the basis of advertisements. Individuals who have a need for those vehicles independent of the irrational and affective attitudes promoted by commercial advertisements would still have access to the product. The effect would be to increase the satisfaction of human needs for a given level of consumption of the environmentally inferior product.

A second set of reforms could focus on the integrity of consumer decision-making processes. Regulators could restrict particular advertising techniques that subvert ratio-

76 *See* Letter from the FTC to Hon. Wendell Ford and Hon. John Danforth, S. Comm. on Commerce, Sci., and Transp., Comm. Statement of Policy on the Scope of Consumer Unfairness Jurisdiction (Dec. 17, 1980), reprinted in In the Matter of Int'l Harvester Co., 104 F.T.C. 949, 1070–76 (1984).

77 *See* Edwards, *supra* note 75, at 343.

78 Of course, fuel-inefficient cars and trucks are only one potential target of this advertising law innovation. Other candidates might include meat, non-organic food, uncertified forest products, and electricity from coal-fired power plants, among countless others.

nal decision making. As Hanson and Kysar explain, "because individuals exhibit systematic and persistent cognitive processes that depart from axioms of rationality, they are susceptible to manipulation by those actors in a position to influence the decision making context."[79] Thus, advertising law might be modified to prohibit common techniques of behavioral manipulation,[80] with the aim of reducing demand for consumer products based on irrational impulses. Though a comprehensive treatment of psychological literature is beyond the scope of this article, techniques targeting the following heuristics and biases should be among the candidates considered for regulation:

- **Manufactured Uncertainty** – Advertisers take advantage of consumers' unfounded optimism in the face of a range of possible outcomes. "[W]hen an attribute is expressed as a range of possible values rather than as a fixed value, individuals interpret the range in favor of the outcome they are predisposed to select."[81] Advertisers regularly capitalize on this cognitive bias of consumers by citing prices (and product attributes) as ranges, often leaving out the higher prices entirely by using formulations like "as low as $1.99" or "up to 50% off." Regulators could require that advertisers use figures that are reasonably representative, rather than figures that represent the outer limits of the possible range.
- **The Power of Zero**[82] – Consumers consistently overreact to things that are "free," such that they are more likely to purchase an item that is marketed as including some portion free than the same total quantity, for the same total price, without the "giveaway."[83]
- **Anchoring** – Because of a pervasive inability to accurately assign absolute value to preferences, consumers are highly vulnerable to the manipulation of contextual cues to suggest value. A mediocre deal can be made to appear much better by pairing it with an even worse one.[84]
- **Artificial Scarcity** – The illusion of scarcity can stimulate artificial demand for products. Thus, offering a product "for a limited time only" increases its perceived value.[85]
- **Visceral Override** – When particular impulses are triggered, such as hunger and sexual arousal, consumers' decisions and attitudes about products are significantly altered.[86] Manipulation of these impulses could be prohibited,

79 Hanson & Kysar, *supra* note 46, at 1424–25.

80 The term is the rough equivalent of what David Yosifon calls "deep capture," *see supra* note 63, at 591, and Matthew Edwards calls "behavioral exploitation." Edwards, *supra* note 77, at 325.

81 Hanson & Kysar, *supra* note 10, at 735.

82 The term is Dan Ariely's. *See* PREDICTABLY IRRATIONAL: THE HIDDEN FORCES THAT SHAPE OUR DECISIONS, Ch. 2 (2008).

83 *Id.*

84 *Id.* at ch. 1.

85 ROBERT CIALDINI, INFLUENCE: SCIENCE AND PRACTICE (2001).

86 Hanson & Kysar, *supra* note 10, at 683, *quoting* George Loewenstein, *Out of Control: Visceral Influences on Behavior*, 65 J. ORG. BEHAV. & HUM. DECISION PROCESSES 272, 272–73 (1996) ("At sufficient levels of intensity, these, and most other visceral factors, cause people to behave contrary to their own long-term self-interest, often with full awareness that they are doing so."); Ariely, *supra* note 82, at ch. 5.

and the prohibition could be cabined by creating a safe-harbor for triggering impulses when it is a necessary incident to communicating product attributes. Thus, McDonald's would be permitted to display its chicken nuggets, but Coors would be prohibited from filling its advertisements with scantily clad females. And food sellers could be prohibited from intentionally timing advertisements to catch television viewers at their most hungry.

- **Mood-congruent Judgments**[87] – The mood that an advertisement produces in recipients has important effects on the way they process the information and stimuli contained in it. "[I]ndividuals in positive moods tend to process information more superficially or heuristically, tend to rely more on stereotypes, and are more easily persuaded than individuals in negative moods."[88] Furthermore, positive emotions may have a tendency to reduce inhibitions and self-control.[89] Conversely, commercials that arouse fear in the viewer prompt "pessimistic risk estimates and risk-averse choices."[90]
- **Repetition Effects** – "The more times a person hears a particular statement, the more likely that person is to believe the statement is true."[91] Over time, people come to believe claims even when they were initially perceived to be unpersuasive, "because after a period of time the subjects disassociate the source of the message from their memory of the message."[92] This effect may explain the alarming rates at which television viewers are found to "believe" puffing claims,[93] or unverifiable statements of opinion that the law assumes consumers will disregard.[94] While repetition of true fact claims may merely aid in learning, overwhelming repetition of non-factual commercial messages is a good candidate for regulation.
- **Ineffective Disclaimers** – Although it is widely accepted that consumers do not read fine print in retail settings,[95] the law continues to assume that fine print disclaimers in television commercials are effective. One study found that more than 62% of Saturday-morning television commercials targeting children contained fine print.[96]

Despite several decades of sheepishness, the FTC is probably still institutionally equipped to play an active role in defining the contours of this broader understanding of misleading advertisements. It has a great deal of experience in using official guidance and rulemaking to provide notice to private actors regarding its interpretations

87 *See* Blumenthal, *supra* note 52.

88 *Id.* at 38.

89 *Id.* at 39.

90 *Id.* at 41. One need only think of the commercials of Brinks Home Security to see the potential for manipulation inherent in advertisements that seek to stimulate fear.

91 Haan, *supra* note 44, at 1301.

92 *Id.* (quoting Linda F. Alwitt & Andrew A. Mitchell, Psychological Processes and Advertising Effects: Theory, Research, and Applications 277 (1985)).

93 Hoffman, *supra* note 45, at 1435–36.

94 *See generally id.* at 1440.

95 *E.g.*, Diane E. Liebert et al., *Effects of Television Commercial Disclaimers on the Product Expectations of Children*, 27 Journal Commc'n 118–24 (1977).

96 Haan, *supra* note 44, at 1294.

of its necessarily broad and somewhat vague statutory mandate. For example, the FTC has long used the so-called "Green Guides" to impose order on the murky and highly fact-dependent determinations of which environmental attribute claims constitute implicit deception.[97] It can do the same to determine which advertising techniques constitute impermissible behavioral manipulation, helping mitigate uncertainty and lessen the risk that truthful, informative commercial speech will be chilled.

The third and most ambitious reform, complementary to prohibiting particular techniques of behavioral manipulation, would limit advertisers to fact claims. Existing rules that preclude liability where consumers have not conformed to a legal standard of reasonableness could be replaced with rules that permit factual inquiries into how actual consumers react—or may be expected to react—to the advertising messages at issue. For example, instead of assuming as a matter of law that consumer decisions are not influenced by unfalsifiable opinion claims (puffery), the law could allow liability premised on such claims if the advertiser knew or intended that a significant portion of the audience would be induced to purchase on the basis of the puffery.[98] After all, it makes little sense to assume consumers adhere to a standard of rational cost-benefit decision making in the face of evidence that they predictably depart from that standard in making purchasing decisions and that advertisers know consumers are not rational. Moreover, a requirement of reasonableness should not be retained as a normative aspiration in the retail purchasing context because it is simply not worth a consumers' time to engage in deliberate, conscious, cost-benefit decision making. Advertisers who put enormous thought and effort into crafting advertising messages can take steps to avoid consumer confusion at lower cost. This stricter regime of advertising regulation could possibly be limited to sellers that engage professional advertisers, or that otherwise make annual advertising expenditures above a certain dollar threshold.

The FTC could play a central role here also, by embracing a broader interpretation of its statutory mandate through its regulations. State law regimes, many of which expressly incorporate FTC standards, would presumably evolve in tandem. But it is important to acknowledge the dramatic effect that a shift from reasonableness requirements to empirical inquiries into consumer behavior would have on the practice of advertising. Because liability does not currently depend on an advertisement's falsity, but can be established on the ground that it is *unsubstantiated*,[99] and because actionable claims can be implicit as well as explicit,[100] the creation of liability for nonfactual claims would include a large proportion of existing advertising. Indeed, unfalsifiable, unsubstantiated implied claims that are intended to and do induce purchases likely

97 Guides for the Use of Environmental Marketing Claims, 16 C.F.R. § 260 (1998), 72 Fed. Reg. 66,091 (Nov. 27, 2007). *See generally* Jennifer Woods, Comment, *Of Selling the Environment—Buyer Beware? An Evaluation of the Proposed F.T.C. Green Guides Revisions*, 21 LOYOLA CONSUMER L. REV. 75 (2008).

98 Others have gone further, calling not only for case-by-case factual inquiries into reliance on puffing claims, but for a burden-shifting regime that would presume liability for puffery unless defendants can negate reliance. *See* Hoffman, *supra* note 47, at 1444.

99 Richard Craswell, *Interpreting Deceptive Advertising*, 65 B.U. L. REV. 657, 710 (1985) (discussing the FTC's substantiation requirement).

100 *Id.* at 697.

appear in *most* current professional advertisements. Eliminating the puffery defense would effectively limit sellers to truthful, substantiated fact claims, fundamentally changing the nature of advertising.

If consumers made fewer purchasing decisions under the sway of advertisements that work by insinuation, emotional appeals, and other forms of behavioral manipulation, then patterns of consumption would more closely approximate the welfare-maximizing ideal of law and economics. Wasteful consumption that complicates efforts to reconcile economy and environment would thereby be reduced. The First Amendment, however, stands as a potential obstacle to regulating advertising messages along these lines. In the next section, I assess constitutional constraints to these proposals and argue that several of the proposed reforms are consistent with the protection afforded to commercial speech.

IV. First Amendment Constraints

For much of the history of the First Amendment, commercial speech—that is, speech proposing a commercial transaction—was unprotected.[101] Laws burdening advertising were spared the scrutiny brought to bear on other categories of speech on the theory that regulation of the commercial sphere was entirely within the realm of legislative judgment[102] and that advertising was a mere adjunct to commercial activity.

The Supreme Court put an end to that approach 1976 with its decision in *Virginia State Board of Pharmacy v. Virginia Citizens Consumer Council*. Commercial speech has since enjoyed an intermediate status between full speech protection and no protection.[103] As the term "commercial speech" connotes, advertising is speech. At the same time, it is in many ways a commercial act, or at least intimately associated with the commercial activity recognized by the courts to be subject to regulation since the excesses of the Lochner era were rejected. Thus, the Supreme Court in *Virginia Pharmacy* made clear that the protection afforded to commercial speech would be less robust than in other speech.[104] The Court qualified its extension of First Amendment protection to advertising in three respects. First, it made clear that time, place, and manner restrictions would be permissible, and even hinted that the First Amendment made more room for such restrictions in the commercial context.[105] Second, the Court made an exception for commercial speech that proposes a commercial transaction that is illegal.[106] Third, and most importantly, the Court made clear that protection did not extend to untruthful commercial speech.[107] And the Court clarified that untruthful speech was not confined to speech that was provably false, but included speech that is

101 *See* Va. State Bd. of Pharmacy v. Va. Citizens Consumer Council, Inc., 425 U.S. 748, 758 (1976) ("There can be no question that in past decisions the Court has given some indication that commercial speech is unprotected.").

102 Valentine v. Christensen, 316 U.S. 52, 54 (1942).

103 *See Virginia Pharmacy*, 425 U.S. at 748.

104 *Id.* at 771.

105 *Id.*

106 *Id.* at 772–73.

107 *Id.* at 771.

"only deceptive or misleading."[108] The Court saw itself as imposing "no obstacle to a State's dealing effectively with this problem."[109] In subsequent cases, a further distinction between commercial speech protection and other speech crystallized: unlike restrictions on core political and other categories of speech, restrictions on commercial speech receive only intermediate scrutiny.[110]

This intermediate treatment of commercial speech has attracted a range of criticisms. From the outset, Justice Rehnquist signaled his disagreement with protecting commercial advertisements, mocking his fellow Justices for equating "public decision making as to political, social, and other public issues" with "the decision of a particular individual as to whether to purchase one or another kind of shampoo."[111] Countless academics have called for sharper doctrinal distinctions between commercial advertisements and core political speech.[112] Many have emphasized that the central justifications for freedom of speech either do not apply, or apply with far less force, in the context of commercial advertisements. For example, since most commercial advertising is done by for-profit corporations, most restrictions on advertising would have no negative impact on human autonomy.[113] And if, as the Supreme Court has said, "the central meaning of the First Amendment" is protection of the right to criticize government and government officers in order to safeguard the democratic process,[114] advertising consumer products seems to bear little or no relation to that purpose.

Despite these criticisms, the doctrinal winds have been blowing in the opposite direction—towards greater protection of commercial speech, not less.[115] Advocates of stiffened scrutiny of commercial speech restrictions emphasize the value of commercial advertising, the difficulty of distinguishing between commercial and noncommercial speech, and the preference for countering harmful speech with more speech. This view has been ascendant at the high court for some time. As Justice O'Connor's opinion for the Court in *Lorillard Tobacco Co. v. Reilly* recognized, at least five Justices then on the Court expressed their willingness to apply strict scrutiny to all restrictions on truthful commercial advertising.[116]

It is unclear to what extent *Sorrell v. IMS Health*,[117] a decision from the Court's last term, effectuates such a change. Justice Kennedy's opinion for the Court states that "heightened scrutiny" applies to the restrictions on pharmaceutical advertising efforts there challenged. *Sorrell* contains a good deal of rhetoric suggesting that this height-

108 *Id.*

109 Va. State Bd. of Pharmacy v. Va. Citizens Consumer Council, Inc., 425 U.S. 748, 771 (1976).

110 *See, e.g.*, U.S. v. Edge Broadcasting Co., 509 U.S. 418, 432 (1993).

111 *Virginia Pharmacy*, 425 U.S. at 787 (Rehnquist, J., dissenting).

112 For a survey and synthesis of many of these arguments, *see* Tamara R. Piety, *Against Freedom of Commercial Expression*, 29 CARDOZO L. REV. 2583 (2008).

113 *Cf.* C. Edwin Baker, *Scope of the First Amendment Freedom of Speech*, 25 UCLA L. REV. 964, 994 (1978) (justifying the First Amendment on the grounds of "self-fulfillment or self-realization.").

114 N.Y. Times v. Sullivan, 376 U.S. 254, 273 (1964).

115 For an argument in favor of extending full First Amendment protection to commercial speech, *see* Alex Kozinski & Stuart Banner, *Who's Afraid of Commercial Speech?*, 76 VA. L. REV. 627 (1990).

116 533 U.S. 525, 554 (2001).

117 131 S. Ct. 2653 (2011).

ened scrutiny is strict scrutiny,[118] but decides in the end only that the restrictions do not survive intermediate scrutiny.[119] *Sorrell* thus appears to take precisely the same tack as its predecessors,[120] assuming without deciding that intermediate scrutiny still applies in commercial speech cases.[121]

In considering whether changes to advertising law would pass constitutional muster, environmentalists can hope for no better than the intermediate scrutiny laid out in *Central Hudson Gas & Electric Corporation v. Public Service Commission of New York*,[122] which has been applied, in form if not substance, in each subsequent case. The traditional formulation of that test is as follows:

> Under *Central Hudson*, commercial speech receives a limited form of First Amendment protection so long as it concerns a lawful activity and is not misleading or fraudulent. Once it is determined that the First Amendment applies to the particular kind of commercial speech at issue, then the speech may be restricted only if the government's interest in doing so is substantial, the restrictions directly advance the government's asserted interest, and the restrictions are no more extensive than necessary to serve that interest.[123]

The remainder of this article inquires whether the proffered changes to advertising law would survive intermediate scrutiny.

A. Restricting Advertising of Environmentally Inferior Products

Restrictions on the advertising of environmentally inferior products, though they would advance important environmental goals at little cost in human welfare, are the least likely of the reforms considered here to survive intermediate scrutiny under *Central Hudson*. As a threshold matter, the government must specify a "substantial interest" that it seeks to serve. The key question is the level of generality at which to frame the interest. An interest in environmental protection and resource conservation would almost certainly qualify as substantial,[124] but its generality could complicate matters at the subsequent tailoring stages. By contrast, the narrower interest in preventing excessive consumerism would facilitate satisfaction of the tailoring requirement, but it runs

118 *Id.* at 2663 ("The law on its face burdens disfavored speech by disfavored speakers."); *id.* ("[The law] goes even beyond mere content discrimination, to actual viewpoint discrimination.") (citing *R.A.V. v. St. Paul,* 505 U.S. 377, 391 (1992), a case that applied strict scrutiny).

119 *Id.* at 2667.

120 *E.g.*, Greater New Orleans Broadcasting Assn., Inc. v. United States, 527 U.S. 173, 184 (1999).

121 As described below, the manner in which *Sorrell* actually *applies* intermediate scrutiny may be subtly innovative.

122 447 U.S. 557 (1980).

123 Posadas de Puerto Rico Assoc. v. Tourism Co. of P.R., 478 U.S. 328, 340 (1986).

124 *See Central Hudson,* 447 U.S. at 568 (holding that the government interest in energy conservation was "plainly" substantial); Nat'l Elec. Mfrs. Ass'n v. Sorrell, 272 F.3d 104, 115 n. 6 (2d Cir. 2001) (recognizing a substantial state interest in protecting the environment from mercury pollution).

the risk that a court would decline to recognize it as substantial. Because, as discussed below, the framing of the governmental interest is unlikely to alter the outcome of the analysis at steps three and four, it makes little sense for proponents of regulation to run this risk.

The third step of the *Central Hudson* analysis requires that the restriction on commercial speech directly advance the substantial government interest. And the Court has cautioned that remote or unlikely advancement of the substantial interest is insufficient.[125] Here, a ban on advertising must directly advance the goal of reducing consumption of the targeted products.

There is some support in Supreme Court precedent for the conclusion that a ban on advertising will suppress demand for a product. In *Edge Broadcasting*, for example, the Court accepted as undeniable the proposition that a restriction on radio advertising for a state lottery that affected only 11% of total airtime would directly advance the state's interest.[126] More recently, however, the Court has been more skeptical of the effectiveness of advertising. In *Lorillard*, even in the face of comprehensive studies by both the Food and Drug Administration (FDA) and the FTC on the effects of tobacco advertising on children, the Court's opinion strained to avoid lending gratuitous support to the argument that restricting advertising might alter consumption patterns, concluding merely that, "[o]n this record and in the posture of summary judgment, we are unable to conclude that the Attorney General's decision to regulate advertising of smokeless tobacco and cigars in an effort to combat the use of tobacco products by minors was based on mere speculation [and] conjecture."[127] In *44 Liquormart, Inc. v. Rhode Island*, Justice Stevens' plurality opinion for four Justices rejected the contention that a ban on price advertising of alcohol would reduce demand, thus promoting the state's asserted interest in temperance. Remarkably, the Justices accepted that the ban on advertising would raise prices, but required a direct evidentiary showing that higher prices would significantly affect aggregate consumption.[128] Lower courts have not always followed the Court in its skepticism of supply and demand, perhaps out of suspicion that the demand for alcohol is exceptionally price inelastic.[129] Nevertheless, the ability of the governments to establish that an advertising ban will reduce demand for environmentally harmful products is not assured.

The final step of the *Central Hudson* analysis is also the most treacherous. A restriction on commercial speech must not be more extensive than necessary for the advancement of the asserted interest. In other words, it must be "narrowly tailored to achieve the desired objective."[130] The Court has on several occasions insisted that, despite the

125 Lorillard Tobacco Co. v. Reilly, 533 U.S. 525, 566 (2001).

126 U.S. v. Edge Broadcasting Co., 509 U.S. 418, 431-32 (1993).

127 *Lorillard*, 533 U.S. at 561 (internal quotation marks and citation omitted).

128 517 U.S. 484, 505–06 (1996). Justice Stevens' skepticism on this point stands in marked contrast to his opinion dissenting from Court's decision that plaintiffs lacked standing to sue in *Allen v. Wright*, 468 U.S. 737, 788 (1986) ("This causation analysis is nothing more than a restatement of elementary economics: when something becomes more expensive, less of it will be purchased.").

129 *See* Coyote Publ'g v. Miller, 598 F.3d 592, 608 (9th Cir. 2010) ("[P]rohibitions on advertising tend to limit demand.").

130 *Lorillard*, 533 U.S. at 556.

linguistic similarity of this test to the standard of strict scrutiny, *Central Hudson* does not require that the government employ the least speech restrictive means in pursuit of its objective.[131] The manner in which the test has been applied in practice, however, gives reason for skepticism. In *Central Hudson*, for example, the Court invalidated a ban on advertising by electric utilities on the ground that it was more extensive than necessary to achieve the goal of energy conservation. The Court reasoned that electric utilities, in promoting consumption of their electricity, might in some cases siphon demand from other energy suppliers whose services were less energy efficient. But the showing that the Court required on this point was vanishingly small. Because it was "within the realm of possibility" that such a circumstance might arise, and without any showing that it had, the Court invalidated the ban.[132] It summarized its holding in sweeping language: "To the extent that the Commission's order suppresses speech that in no way impairs the State's interest in energy conservation, the Commission's order violates the First Amendment[]."[133]

The Court applied an even stricter version of the narrow tailoring requirement in *Lorillard*. In that decision, tobacco companies challenged a Massachusetts law prohibiting the advertising of tobacco products within 1,000 feet of a school. At step four of the *Central Hudson* analysis, the Court concluded that the State's failure to vary the radius of the no-advertising zone depending on whether the area was urban or rural demonstrated a fatal lack of tailoring, because much more speech would be restricted in urban areas—which have a high density of schools—than in rural areas.[134] Yet the Court never explained why the interest in protecting schoolchildren was not correspondingly greater as well in areas with more schools, so this apparently amounted to a holding that a commercial speech restriction's impact on protected speech can require invalidation even when that impact is a necessary incident to the advancement of a substantial government interest. This scrutiny is "intermediate" in name only.

Given that the Court has in practice required that tailoring of commercial speech restrictions be nearly perfect, and that the circumstances under which restrictions on advertising an environmentally harmful product would be more extensive than necessary are limited only by the Court's imagination, the proposal to restrict advertising of environmentally inferior products is unlikely to withstand intermediate scrutiny. The Court's decision last term in *Sorrell* strengthens this conclusion. *Sorrell* contains sweeping language that suggests that restricting a disfavored advertising message is *never* permissible, even if the restrictions serve an important state interest. For example, when *Sorrell* states the traditional standard of intermediate scrutiny, it adds that the standard "ensure[s] . . . that the law does not seek to suppress a disfavored message."[135] More dramatically, it dismisses out of hand the argument that the restrictions are justified by the interest in protecting the integrity of the doctor-patient relationship because

131 *See id.*

132 *Central Hudson*, 447 U.S. at 570 ("[w]e must credit as within the realm of possibility the claim that electric heat can be an efficient alternative in some circumstances.")

133 *Id.*

134 Lorillard Tobacco Co. v. Reilly, 533 U.S. 525, 563 (2001) ("The uniformly broad sweep of the geographical limitation demonstrates a lack of tailoring.").

135 Sorrell v. IMS Health, 131 S. Ct. 2653, 2668 (2011).

"the fear that speech might persuade provides no lawful basis for quieting it."[136] *Sorrell* seems to leave little room for regulatory regimes that burden truthful advertising out of concern about the effects of the advertising.

B. Restricting Nonfact Claims and Other Behaviorally Manipulative Advertising Techniques

As with restrictions on the advertising of particular products, restrictions targeting nonfactual or manipulative advertising techniques would be unlikely to survive a strict application of the tailoring requirements of *Central Hudson*. Whatever governmental interest is asserted, it is easy to imagine particular applications of the restriction—particular advertisements—that would render the ban overbroad. For example, if the asserted interest is resource conservation or pollution reduction, the ban would be vulnerable to the precise criticism that was fatal to the ban in *Central Hudson*, namely, that in a particular case a behaviorally manipulative technique might actually promote the consumption of an environmentally superior product to the detriment of an environmentally inferior one. And even if a more specific governmental interest is accepted as substantial at step two of the test, such as the interest in combating consumerism, one can imagine particular instances in which a behaviorally manipulative advertisement (albeit a rather inept one) would produce less consumerism than a particularly effective fact-based advertisement.

Instead, if behaviorally manipulative advertising rules are to have a chance of withstanding challenge, it must be under the exception for false, deceptive, or misleading speech. Speech that falls into that category, *Central Hudson* instructs, evades "intermediate" scrutiny altogether. Moreover, unlike the latter prongs of the *Central Hudson* test, the application of which has grown steadily stricter over the last two decades, the exception for misleading speech is largely defined by precedents that predate the most protective era for commercial speech.[137] In many of the Court's more recent cases, states have waived the argument that the targeted speech was misleading.[138] In addition, most of the precedents in this area are confined to a very specific type of communications—advertising by attorneys—traditionally subject to strict oversight.[139] The first prong of *Central Hudson*, therefore, represents an area of constitutional law that may yet prove adaptable to new social-psychological insights and newly urgent governmental objectives.[140]

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136 *Id.* at 2670.

137 *See* Bates v. State Bar of Ariz., 433 U.S. 350 (1977); In re R. M. J., 455 U.S. 191 (1982). *But see* Peel v. Att'y Registration and Disciplinary Comm'n of Ill., 496 U.S. 91, 109 (1990) (hewing to a presumption that factually true statements were not misleading where no evidence to the contrary had been presented).

138 Yosifon, *supra* note 61, 568–71.

139 *See*, *e.g.*, *Bates*, 433 U.S. 350; *In re R. M. J.*, 455 U.S. 191.

140 Robert Post has convincingly argued that an exception for misleading speech is inconsistent with the rationale for protecting commercial speech in the first place unless premised on and limited by the same social-psychological considerations. Robert Post, *The Constitutional Status of Commercial Speech*, 48 UCLA L. REV. 1, 41 (2000). For Post, the misleading exception can only be justified in terms of the context in which most commercial advertising occurs – a context characterized by consumer irrationality, vulnerability, and dependence. *Id.*

There is yet another reason for focusing on the exception for misleading speech. Even if the Justices who, in *44 Liquormart*, signaled their willingness to abandon *Central Hudson* confront a case that clearly presents the issue of misleading speech, it seems likely that misleading speech will remain unprotected, at least in the near term. Even fierce critics of the Court's countenancing of restrictions on commercial speech, such as Chief Judge Kozinski of the Ninth Circuit, accept that untruthful speech ought to remain subject to regulation.[141] They point to the persistence of the tort of libel as evidence that strict scrutiny can accommodate the need to regulate untruth.[142] More significantly, the four Justices who favor the application of strict scrutiny to commercial speech restrictions have not indicated that they would go so far as to curtail the government's power to regulate untruthful speech.[143] Given the apparent durability of the First Amendment's exception for misleading commercial speech, the question becomes whether it is broad enough to encompass advertising that exploits consumers' behavioral failings.

Academics have devoted some attention to the question of what the constitutional bounds of misleading speech ought to be,[144] but surprisingly little ink has been spilled in an effort to ascertain what the constitutional exception for misleading speech *is*. The corpus of advertising law has a number of distinct parts, and has evolved over time as courts and agencies interpret the relevant statutes.[145] Did the Supreme Court bless all of these restrictions on advertising when it announced its commercial speech test? If not, which restrictions fall within and which fall outside of the First Amendment exception?

In *Bates*, the foundational case for the false speech exception, the Supreme Court said that "[a]dvertising that is false, deceptive, or misleading of course is subject to restraint,"[146] but had no occasion to decide whether the concept of misleading speech is limited to speech that tends to induce an incorrect inference or belief on the part of recipients of the message, or whether it might extend to behaviorally manipulative advertising—advertising that tends to manipulate consumer behavior without implicat-

141 Kozinski & Banner, *supra* note 115, at 651. Some have gone so far as to suggest doing away with fraud. *See* Aaron A. Goach, *Recent Developments, Free Speech and Freer Speech: Glickman v. Wileman Bros. & Elliot, Inc.*, 117 S. Ct. 2130 (1997), 21 Harv. J.L. & Pub. Pol'y 623, 635 (1995) (arguing that counterspeech is the solution to commercial fraud).

142 Kozinski & Banner, *supra* note 115, at 651–52. *But see* Rebecca Tushnet, *It Depends on What the Meaning of 'False' Is: Falsity and Misleadingness in Commercial Speech Doctrine*, 41 Loy. L.A. L. Rev. 227, 228–29 (2007) (arguing that the heightened scienter requirements for political libel mean that "[w]e cannot have much consumer protection law in a world that treats commercial speech like political speech").

143 44 Liquormart v. Rhode Island, 517 U.S. 484, 501 (1996) (plurality opinion) ("[W]hen a State entirely prohibits the dissemination of *truthful*, *nonmisleading* commercial messages for reasons unrelated to the preservation of a fair bargaining process, there is far less reason to depart from the rigorous review that the First Amendment generally demands.") (emphasis added).

144 *See* Tushnet, *supra* note 142; Scott Wellikoff, *Mixed Speech: Inequities that Result from an Ambiguous Doctrine*, 19 St. John's J. Legal Comment. 159, 192–93 (2004); John O. McGinnis, *The Once and Future Property-Based Vision of the First Amendment*, 63 U. Chi. L. Rev. 49, 128–29 (1996).

145 *See generally* Edwards, *supra* note 77.

146 Bates v. State Bar of Ariz., 433 U.S. 350, 383 (1977).

ing rational thought. David Yosifon has argued that the core premises of the commercial speech doctrine are, as with most law, solidly "dispositionist." That is, recipients of advertising are assumed by the doctrine to be "receiving and rationally analyzing [information] in order to exercise consumer choices that satisfy their preferences and make them better off."[147]

At least one statement by the Court in *Bates* supports this reading. In concluding that Bates' use of a particular term—"legal clinic"—in an advertisement was not misleading, Justice Blackmun wrote, "We suspect that the public would readily understand the term 'legal clinic' *if, indeed, it focused on the term at all*."[148] One interpretation of the latter phrase, admittedly, would be that a claim cannot be misleading if the public does not "focus on" it. That reading would provide support for the view that misleading speech encompasses only claims that are likely to be consciously accepted as true by members of the public, and excludes speech that persuades by subtler means.[149]

This approach to misleading speech is undeniably commonplace in the law of deceptive advertising. Despite the fact that the FTC Act of 1914 prohibits "unfair and deceptive *acts* or *practices*,"[150] the FTC and reviewing courts typically analyze alleged violations of the Act on the basis of particular "product claims" by advertisers.[151] Though these claims can be either express or implied, the techniques of behavioral manipulation do not fit neatly into either category. This orientation towards fact claims, express or implied, is deeply ingrained in the field of FTC and FDA advertising law.[152]

That these applications of advertising law do not encompass behaviorally misleading claims does not, however, decide the question whether a behavioralist application would be constitutionally permissible. Several strong arguments support the view that behaviorally manipulative advertising techniques can qualify as misleading under *Central Hudson*. First, the Supreme Court has, on several occasions, identified the premises that undergird its resolution of challenges to particular restrictions on allegedly mis-

147 Yosifon, *supra* note 61, at 551.

148 *Bates*, 433 U.S. at 381 (emphasis added).

149 The language is susceptible of another interpretation also, friendlier to a behavioral approach to misleading advertising. Blackmun could merely be alluding to the familiar requirement in advertising law that a statement be material—meaning instrumental in purchase decisions—in order to qualify as deceptive, rather than imposing a requirement that the effect on a purchase decision be rational and conscious. On the requirement of materiality, *see Policy Statement on Deception* 165, in the form of a Letter from James C. Miller III, Chairman, FTC, to John D. Dingell, Chairman, House Comm. on Energy and Commerce (Oct. 14, 1983), reprinted in 5 TRADE REG. REP. (CCH) 50,455, at 56,071 n.3 (1983).

150 15 U.S.C. § 45 (1982) (emphasis added).

151 Thompson Medical Co., Inc., 104 F.T.C. 648, 788–89 (1984), *aff'd*, 791 F.2d 189 (D.C. Cir. 1986), *cert. denied*, 479 U.S. 1086 (1987).

152 *See* Jacob Jacoby et al., *Survey Evidence in Deceptive Advertising Cases Under the Lanham Act: An Historical Review of Comments from the Bench*, 795 COM. L. AND PRACTICE COURSE HANDBOOK SERIES 231 (discussing survey methodologies for determining consumer beliefs about FDA-regulated products, without considering the possibility that advertising might not affect conscious consumer beliefs about specific product attributes); *see also* Richards & Zakia, *Pictures: An Advertiser's Expressway Through FTC Regulation*, 16 GA. L. REV. 77, 132 (1981) (criticizing the FTCA regime for failing to address appeals to consumers' "inner drives").

leading advertising and made clear that they are not inviolable. Thus, while the Court has articulated a presumption that truthful advertisements are not misleading,[153] it has also offered the following disclaimer:

> The commercial speech doctrine is itself based in part on certain empirical assumptions as to the benefits of advertising. If experience proves that certain forms of advertising are in fact misleading, although they did not appear at first to be "inherently" misleading, the Court must take such experience into account.[154]

While statements like these do not resolve the question whether the misleading speech exception extends to behavioral manipulation, they nonetheless signal the degree to which the Court endeavored to leave this area of doctrine adaptable and flexible. Most importantly, this authority indicates that the category of misleading speech ought to be defined by reference to evolving empirical—and perhaps sociological or psychological—understandings, not traditional common law notions. As a result, courts ought to start from a posture of flexibility in hearing arguments for a new or expanded understanding of "misleading." In other words, while other steps of the *Central Hudson* analysis appear to have constricted regulators in recent decades, the same is not true of the first prong.

More to the point, although the exception crystallized in *Central Hudson* as concerning "misleading" speech, several other formulations by the Court support a broader exception. In *Bates*, for example, the Court expressed concern about "undue influence" and expressly reserved the question whether speech that posed such a risk was owed any First Amendment protection. That more expansive formulation of the exception was subsequently endorsed by Justice Stevens' lead opinion in *44 Liquormart*. Justice Stevens went so far as to say that a state "may restrict some forms of aggressive sales practices that have the potential to exert 'undue influence' over consumers." [155] Undue influence, a notion rooted in the close relationship between lawyer and client, undoubtedly extends beyond implied factual premises to encompass other forms of persuasion. Black's Law Dictionary, for example, defines undue influence as "[t]he improper use of power or trust in a way that deprives a person of free will and substitutes another's objective."[156] The tendency of behaviorally manipulative advertising to influence purchase decisions by displacing a consumer's rational faculties is a strikingly close analog to this definition of undue influence, centered as it is on the failure of "free will." This is strong support for the behavioralist approach.

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153 Peel v. Att'y Registration and Disciplinary Comm'n of Ill., 496 U.S. 91, 109 (1990).

154 *In re* R.M.J., 455 U.S. 191, at 201 n. 11 (1982) (citation omitted); *see also* Bates v. State Bar of Ariz., 433 U.S. 350, 384 (1977) ("[W]e recognize that many of the problems in defining the boundary between deceptive and nondeceptive advertising remain to be resolved.")

155 44 Liquormart v. Rhode Island, 517 U.S. 484, 498 (1996); *see also In re* R.M.J., 455 U.S. at 202 ("In *Ohralik v. Ohio State Bar Assn.*, 436 U.S. 447, 462, 98 S.Ct. 1912, 1921, 56 L.Ed.2d 444 (1978), the Court held that the possibility of fraud, undue influence, intimidation, overreaching, and other forms of 'vexatious conduct' was so likely in the context of in-person solicitation, that such solicitation could be prohibited.") (internal quotation marks omitted).

156 Black's Law Dictionary 1666 (9th ed. 2009).

Another formulation from the Court's precedents provides further support for a wider interpretation of the misleading exception. In *Ohralik v. Ohio State Bar Association,* the Court upheld a prophylactic ban on a lawyer's in-person solicitation of clients because such solicitation "is inherently conducive to overreaching and other forms of misconduct."[157] Justice Stevens also incorporated that holding into his survey of the exceptions to *Central Hudson* in *44 Liquormart*.[158] Black's Law Dictionary offers this definition of overreaching: "The act or an instance of taking unfair commercial advantage of another, esp. by fraudulent means."[159] The definition makes clear that the term overreaching is not limited to traditional notions of fraud. And the fact that overreaching connotes *unfairness* is of special significance in the context of advertising law. At the time of *Ohrahlik*, unfair acts or practices were well established in the decisions of the FTC as a category of misconduct that extended beyond pure deception.[160] The legal concept of unfairness "permitted the [FTC] to reach beyond the more strict boundaries of deception, to right a variety of vaguely defined inequities including immoral, unethical, oppressive, or unscrupulous conduct."[161] One treatise explains that unfairness would have covered a practice like "coaxing children to nag their parents to purchase a certain product."[162] Read with proper regard for well-established principles of advertising law, then, the category of unprotected commercial speech could well accommodate persuasive techniques that do not involve false factual claims.

Other aspects of the three major federal advertising law regimes, of which the Supreme Court was undoubtedly aware when it articulated the exception, also support a broad reading of the exception. The Lanham Act,[163] which provides a private right of action for unfair competition, was understood to create a cause of action governing not only express and implied false claims, but "subliminal" claims as well.[164] The inchoateness of these subliminal claims is reinforced by an alternative formulation often used by courts to refer to these claims: "tendency to mislead, confuse, or deceive."[165] The term *confuse*, unless it is redundant in this formulation, seems to carry a connotation of muddling or evading a consumer's rational faculties—precisely what occurs in cases of behaviorally manipulative advertising.

Agency interpretations of the Food, Drug, and Cosmetics Act (FDCA) at the time of the Supreme Court's early commercial speech decisions provide further support. A proposed rulemaking dating to 1975 interpreted the statutory term "misleading prescription drug advertising" as an advertisement which causes "a common impres-

157 436 U.S. at 464.

158 *44 Liquormart,* 517 U.S. at 503 (Stevens, J., concurring).

159 BLACK'S LAW DICTIONARY (9th ed. 2009).

160 See Fed. Trade Comm'n v. Raladam Co., 283 U.S. 643, 651–52 (1931) (describing deceptiveness and unfairness as discrete categories of regulable commercial behavior).

161 JEF I. RICHARDS, FOUNDATION FOR THEORY AND ASSESSMENT OF DECEPTION: THE LEGAL AND BEHAVIORAL SITUS OF ADVERTISING MISREPRESENTATIONS 34 (1988).

162 *Id.* at 36.

163 Trademark Act of 1946 (Lanham Act), 15 U.S.C. § 1125(a) (2006).

164 S.C. Johnson & Son, Inc. v. Carter-Wallace, Inc., 614 F.Supp. 1278, 1319 (S.D.N.Y. 1985).

165 American Home Products Corp. v. Johnson & Johnson, 577 F.2d 160, 165–66 (2d Cir. 1978).

sion or belief regarding the advertised drug which is incorrect or not justified."[166] An *unjustified impression*, as opposed to an *incorrect belief*, appears quite accommodating of nonrational behavioral responses.

Perhaps the strongest statutory support for a broad reading of *misleading* comes from the interpretations of the Federal Trade Commission's organic act (FTCA). Several court decisions supported an interpretation of the FTCA as extending protection to unthinking, irrational consumers. The Seventh Circuit, in *Aronberg v. FTC*, explained:

> The law is not made for experts but to protect the public—that vast multitude which includes the ignorant, the unthinking and the credulous, who, in making purchases, do not stop to analyze but too often are governed by appearances and general impressions.[167]

In 1976, the Third Circuit reiterated this expansive view of the FTCA, holding that protection from false advertising extends to the consumer whose reaction is "singularly dense."[168] In 1984, the Reagan administration tightened the interpretation of the FTCA, limiting false advertising claims to consumers "acting reasonably under the circumstances."[169] This history suggests that the FTCA extended to unreasonable consumer responses to advertisements prior to the promulgation of that interpretation, which postdated most of the seminal Supreme Court decisions on misleading commercial speech. Given that context, it seems unlikely that the Court meant to exclude irrational responses to advertisements when it articulated the exception for misleading speech in 1977.

Finally, larger considerations about the purpose of commercial speech protection fit well with the proposal to regulate behaviorally manipulative advertising. "The protection of commercial speech is at least in part instrumental."[170] In extending First Amendment protection to commercial speech in *Virginia Pharmacy*, the Supreme Court explained that the value of advertising lies in facilitating intelligent consumer decisions by individuals in a market economy.[171] To that end, advertising deserves protection to the extent that it provides "information as to who is producing and selling what product, for what reason, and at what price."[172] Restrictions on behaviorally manipulative advertising techniques will not prevent sellers from communicating that type of information. To the contrary, restrictions on manipulative techniques will privilege factual content currently obscured by a torrent of confusing, affective and visceral appeals. Indeed, the current proliferation of factually impoverished advertising may be the unintended consequence of the focus of the current regulatory regime on

166 Jacob Jacoby & Constance Small, *The FDA Approach to Defining Misleading Advertising*, 795 Com. L. & Practice Course Handbook Series 223, 226 (1999).

167 132 F.2d 165, 167 (1942).

168 Beneficial Corp. v. FTC, 542 F.2d 611, 618 (3d Cir. 1976).

169 Policy Statement, *supra* note 149, at 165.

170 Coyote Publ'g v. Miller, 598 F.3d 592, 601 (9th Cir. 2010).

171 Va. State Bd. of Pharmacy v. Va. Citizens Consumer Council, Inc., 425 U.S. 748, 765 (1976).

172 *Id.*

fact claims.[173] Advertisers must be equally held to account for behavioral deception in order to restore the incentive to provide useful market information. Advertisers' right to provide the information necessary to a well functioning market—who is producing and selling what, how, and at what price—will remain unencumbered. Regulating behavioral manipulation, therefore, would serve the core purpose of commercial speech protection.[174]

A second underlying consideration that has shaped the evolution of commercial speech doctrine is a concern about paternalism. The Supreme Court has a pronounced tendency to dismiss arguments about consumer irrationality as paternalistic. In *Virginia Pharmacy*, for example, the Court observed that it was hard to see how the law protected consumers by keeping them ignorant and referred to the restriction as "highly paternalistic."[175] Similarly, in his plurality opinion in *44 Liquormart*, Justice Stevens declared his skepticism of all "regulations that seek to keep people in the dark for what the government perceives to be their own good."[176] The proposal to regulate behaviorally manipulative advertising stands apart from these concerns, because it is aimed not at protecting individuals from themselves, but at saving the human environment from wasteful and destructive forms of consumerism. In regulating these commercial advertisements, government would be carrying out what political science, economics, and law all recognize to be among its core duties: laying the foundation for well-functioning markets by combating incomplete information and negative externalities.

Nevertheless, courts may well balk at restrictions on speech that sweep as broadly as the elimination of puffery as a defense to liability for deceptive advertising. As noted, that change in the law could expose a large portion of sellers who employ professional advertising to liability. The Eighth Circuit's decision in *American Italian Pasta Co. v. New World Pasta Co.*[177] is instructive. *New World Pasta* rejected the use of surveys to determine whether consumers would in fact rely on a claim that the court considered puffery. Significantly, the court suggested that departing from the standard of the reasonable consumer would raise First Amendment concerns.[178] Many courts will, like the Eighth Circuit, be concerned about the risk that a rule that requires advertisers to heed consumers' unreasonable tendencies will prove "unpredictable" and "chill commercial speech,"[179] and stick instead with a construct that reliably—and not coincidentally—mirrors their own intuitions: the reasonable person.

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173 For an argument along these lines, see Shimp, *supra* note 43, at 28–29.

174 Much of the skepticism of the Justices on the left of the Court has been expressly confined to regulations that do not seek to "[protect] consumers from 'commercial harms.'" 44 Liquormart v. Rhode Island, 517 U.S. 484, 502–03 (1996) (Stevens, J., concurring) (plurality opinion). Their concern is inapposite to the proposals at issue.

175 *Virginia Pharmacy*, 425 U.S. at 770.

176 *44 Liquormart*, 517 U.S. at 503.

177 371 F.3d 387, 394 (8th Cir. 2004).

178 *Id.* at 393–94.

179 *Id.*

The desire of courts to apply a standard of reasonableness in judging whether a particular statement is misleading is rooted in a basic free market orientation,[180] which is in turn premised, as we have seen, on the consumer as rational actor, intelligently and methodically weighing the information available to him or her in order to make welfare-maximizing purchases. "The problem with rational choice theory, as a universal characterization of human behavior, is that it is demonstrably false."[181] It is in precisely this respect that the First Amendment doctrine must evolve beyond its common law roots to embrace behavioral science's richer understanding of how human beings make consumer decisions. Courts seem more likely to embrace that evolution if it comes in the context of narrow restrictions on specific techniques, in the wake of an expert agency's public rulemaking. Though the two proposals for reform of advertising law share the same theoretical foundations and serve similar goals, the proposal to empower the FTC to restrict specific techniques of behavioral manipulation may thus be more likely to pass constitutional muster than the elimination of puffery defenses in deceptive advertising lawsuits.

V. Conclusion

My aim in this article has been to provide a broad assessment of the prospects for using advertising law to promote environmental sustainability. If reducing the environmental harms associated with prevailing levels of material welfare is a valuable policy goal, then policymakers should look closely at the potential contribution from reforming advertising law.

I have examined three such reforms, aimed, respectively, at enhancing the informational content of advertising, reducing its tendency to subvert rational consumer decision making, and encouraging environmentally superior choices. They are: (1) provide for liability for all advertising claims, express and implied, that are intended to, and in fact do, induce purchase on the basis of a false or unsubstantiated impression, whether or not the consumer's actions were "reasonable"; (2) prohibit, through FTC rulemaking, the use by advertisers of techniques calculated to subvert rational consumer decision making by manipulating common heuristics and biases; and (3) restrict the advertising of environmentally inferior products.

The first two reforms would both help incentivize the provision of information by advertisers and reduce the obstacles to intelligent (if subconscious[182]) decision mak-

180 *See* Edward T. Highberger, *Not So Fast! Scrutinizing the "Gun Jumping" Provisions of the Secuirities Act Under the Commercial Speech Doctrine*, 83 Notre Dame L. Rev. 2141, 2141 (2008). While the Supreme Court has, at times, suggested that its commercial speech jurisprudence is about balancing interests, the formulation of these balances often defies credulity. In *Lorillard*, the Court said that adults had an interest in receiving truthful information about tobacco products from billboards. While there may be some adult somewhere that treasures viewing such billboards, it seems more plausible that the Court is motivated by an objective notion of what constitutes economically efficient consumption. 533 U.S. at 564.

181 Edward L. Rubin, *Rational Choice and Rat Choice: Some Thoughts on the Relationship Among Rationality, Markets, and Human Beings*, 80 Chi. Kent L. Rev. 1091, 1098 (2005).

182 *See* William M. Landes & Richard A. Posner, The Economic Structure of Tort Law 23 (1987) ("People can apply the principles of economics intuitively—and thus 'do' economics

ing by consumers. Both reforms could potentially survive constitutional scrutiny on the basis that the exception to commercial speech protection for misleading speech is broad enough to encompass speech that is calculated to, and does, subvert rational decision making. I predict that the likelihood of courts upholding such an advertising restriction will be proportional to the degree of careful psychological, sociological, and economic study undertaken by the regulation's legislative or agency proponents, and inversely proportional to its breadth.

Surprisingly, the last of the three reforms appears both the most politically feasible and the least likely to withstand constitutional scrutiny. Lawmakers have shown themselves willing to prohibit environmentally inferior products like gas-guzzling vehicles. By choosing to restrict the advertising of such products in the future, rather than banning them outright, regulators could more finely balance the need to reduce environmental impacts and the authentic material needs of a subset of consumers. But such legislation would not survive First Amendment scrutiny, as the *Central Hudson* decision itself demonstrates. Valuable as it would be for reducing environmental harm at minimal cost in material welfare, such regulation will be off-limits as long as courts persist in applying a narrow tailoring requirement to restrictions on commercial speech that is akin to the requirement that applies to restrictions on core political speech.

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without knowing they are doing it.").

Finding Promise in Pond Scum: Algal Biofuels, Regulation, and the Potential for Environmental Problems

by Heather Hunziker

I. Introduction

The oil and gas industry has been a large part of Texas's economy for over a century; however, with growing concerns over global warming and increasing security dangers from dependence on (largely) foreign oil, many in the United States are looking to biofuels as the energy source of the future. Corn ethanol was the first big wave in modern American biofuels.[1] The second wave consisted of more efficient crops such as sugarcane and switchgrass to make ethanol and biodiesel.[2] However, the corn lobby has yet to release its grip on control of the ethanol industry.[3] The next highly promis-

1 *Towards Sustainable Production and Use of Resources: Assessing Biofuels*, United Nations Env't Programme, 25, 34 (2009), http://www.unep.fr/scp/rpanel/pdf/Assessing_Biofuels_Full_Report.pdf.

2 *Id.* at 25.

3 *See, e.g.*, Don Carr, *Corn Lobby Reaps Crops of Trouble*, Envt'l. Working Grp. (Aug. 29, 2011), http://www.ewg.org/agmag/2011/08/corn-lobby-reaps-crops-of-trouble; Ted Koppel, *Shucking the Corn Lobby on Ethanol*, National Public Radio (Apr. 21, 2008), http://www.npr.org/templates/story/ story.php?storyId=89817188; *Corn Lobby's Tall Tale of a Gas Substitute*, Christian

ing incarnation of biofuel is in algae,[4] and already Texas is making moves to become an industry leader.[5] Cellulosic fuels from algae could be the future of energy in Texas. Before that hope can become reality, though, Texas must establish a regulatory framework that advances the positive aspects of algal biofuels while at the same time protecting against the industry's potential pitfalls.

When corn ethanol first appeared as a viable option for replacing a small percentage of the nation's oil requirement, it was promoted as furthering energy independence, and the public was largely delighted.[6] Congressmen from the cornbelt states took advantage of this national goodwill towards ethanol to do everything in their power to promote it, from continuing corn subsidies in successive federal Farm Bills,[7] to providing tax benefits and grants to ethanol producers,[8] to instituting a national Renewable Fuel Standard.[9] It took awhile before the drawbacks and problems of corn ethanol were broadly recognized. As corn was diverted to ethanol production, competition between food and fuel for crops became a worrisome complication.[10] High inputs of water[11] and nitrogen fertilizer used in corn production, which can cause "dead zones" in coastal waters where the fertilizer accumulates from runoff, were also

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SCI. MONITOR (May 12, 2006), *available at* http://www.csmonitor.com/2006/0512/p08s01-comv.html.

4 UNITED NATIONS ENV'T PROGRAMME, *supra* note 1, at 5.

5 See *infra* Part II.C. – The Future of Algal Biofuel.

6 *See, e.g.*, Editorial, *Swearing Fealty to Ethanol*, N.Y. TIMES, Dec. 3, 2003, http://www.nytimes.com/2003/12/03/ opinion/swearing-fealty-to-ethanol.html?scp=1&sq=corn+ethanol&st=nyt (describing ethanol promotion by 2004 Democratic presidential candidates); Editorial, *The Feel-Good Fuel*, ST. PETERSBURG TIMES, July 20, 2005, http://www.sptimes.com/2005/07/20/Opinion/The_feel_good_fuel.shtml (questioning congressional and environmentalist enthusiasm for corn ethanol production).

7 *See 2011 Farm Subsidy Database*, ENVIRONMENTAL WORKING GROUP, http://farm.ewg.org/ progdetail.php?fips=00000&progcode=corn (last visited Sept. 25, 2011).

8 *See, e.g.*, American Jobs Creation Act of 2004, Pub. L. 108-357, §§ 301–03, 118 Stat. 1418, 1459–463 (2004) (creating the Volumetric Ethanol Excise Tax Credit and new biodiesel tax credits).

9 *See, e.g.*, Energy Policy Act of 2005, Pub. L. 109-58, 119 Stat. 594, 1067–076 (2005) (creating the Renewable Fuel Standard and establishing the first renewable fuel volume mandate in the U.S.); Energy Independence and Security Act of 2007, Pub. L. 110-140, 121 Stat. 1492, 1519–532 (2007) (expanding the Renewable Fuel Standard).

10 *See*, Andrew Martin, *Food and Fuel Compete for Land*, N.Y. TIMES, Dec. 18, 2007, http://www.nytimes.com/ 2007/12/18/business/18food.html?pagewanted=all; David Tilman & Jason Hill, *Corn Can't Solve Our Problem*, WASH. POST, Mar. 25, 2007, http://www.washingtonpost.com/wp-dyn/content/article/2007/03/23/ AR2007032301625.html (noting protests over higher food prices in Mexico City and in the U.S. Congress). For data on corn usage by segment, *see generally 2011 World of Corn: Statistics Book*, NAT'L CORN GROWERS ASS'N (2011), http://www.ncga.com/uploads/useruploads/ woc-metric-2011.pdf.

11 *See* Carey W. King & Michael E. Webber, *Water Intensity of Transportation*, 42 ENVTL. SCIENCE & TECH. 7866, 7867-69 (2008) (finding that, while conventional petroleum refining uses 1-2.5 gallons of water to create a gallon of fuel, creating a gallon of fuel from corn can take up to 7.3 gallons of water).

troublesome.[12] Detractors pointed out the inefficiencies in a system that barely created more fuel than it used and maybe just about broke even on carbon dioxide release.[13] Meanwhile, most of the world's vehicles are not built for ethanol, and engines are still largely incompatible with more than 10–20% ethanol use.[14] Studies show that, as ethanol levels in gasoline are increased, the fuel becomes less compatible with fueling infrastructure materials (such as metals and polymers) not designed for ethanol mixtures.[15] The exception is those vehicles that have been especially modified to accept high-ethanol fuel.[16] Moreover, ethanol use raises questions surrounding high emissions of air pollutants other than carbon dioxide, such as nitrogen oxides.[17]

Other parts of the world are making biofuels from more efficient feedstocks than corn. For instance, Brazil is the world leader in producing ethanol from sugar cane, which is abundant there.[18] Europe, a worldwide leader in biodiesel production with

12 *See* David Biello, *Fertilizer Runoff Overwhelms Streams and Rivers–Creating Vast 'Dead Zones*, Sci. Am., Mar. 14, 2008, http://www.scientificamerican.com/article.cfm?id=fertilizer-runoff-overwhelms-streams; *Corn Boom Could Expand 'Dead Zone' in Gulf*, Associated Press, Dec. 17, 2007, *available at* http://www.msnbc.msn.com/ id/22301669/ns/ us_news-environment/t/ corn-boom-could-expand-dead-zone-gulf/#.TnT44RzZfdM (describing a "dead zone" in the Gulf of Mexico, "a 7,900-square-mile patch so depleted of oxygen that fish, crabs, and shrimp suffocate.").

13 *See, e.g.*, Tilman & Hill, *supra* note 10.

14 *See* M.D. Cass et al., *Intermediate Ethanol Blends Infrastructure Materials Compatibility Study: Elastomers, Metals, and Sealants*, Oakridge Nat'l Lab., 1 (Mar. 2011), http://info.ornl.gov/sites/ publications/ files/Pub27766.pdf.

15 *See id.*; *see also E20: The Feasibility of 20 Percent Ethanol Blends by Volume as a Motor Fuel*, Minn. Dep't of Agric., *1 (Nov. 4, 2008), [hereinafter *E20: Feasibility*], http://www.mda.state.mn.us/en/renewable/ethanol/ e20testresults.aspx, *and* Gary Mead, et al., *An Examination of Fuel Pumps and Sending Units During a 4000 Hour Endurance Test in E20*, Minn. Center for Auto. Res., 7 (Mar. 25, 2009), http://www.mda.state.mn.us/sitecore/ content/Global/MDA-Docs/renewable/ethanol/e20endurance.aspx (finding that cars run as well on up to 20% ethanol blends as on zero or 10% ethanol blends).

16 *See E20: Feasibility*, *supra* note 15, at *2.

17 *See, e.g.*, Jason Hill et al., *Environmental, Economic, and Energetic Costs and Benefits of Biodiesel and Ethanol Biofuels*, 103 Proc. of the Nat'l Acad. Of Sci. of the U.S. 11,206, 11,207 (2006) (finding increased numbers of air pollutants such as nitrogen oxides); *see also* Jeffrey S. Gaffney et al., *Potential Air Quality Effects of Using Ethanol-Gasoline Fuel Blends: A Field Study in Albuquerque, New Mexico*, 31 Envtl. Sci. & Tech. 3053, 3053-60 (1997) (finding increased levels of ozone, peroxyacetyl nitrate, and aldehyde).

18 In 2010, Brazil led the world in fuel ethanol production. *World Fuel Ethanol Production*, Renewable Fuels Assoc., http://ethanolrfa.org/pages/World-Fuel-Ethanol-Production (last visited Sept. 25, 2011). In 2009, Brazil led the world in sugarcane production. *FAOSTAT*, Food & Agric. Org. of the United Nations, http://faostat.fao.org/ site/ 567/DesktopDefault.aspx?PageID=567#ancor (select the following parameters: under "country," select "World > (List)"; under "year," select "2009"; under "item," select "Sugar cane"; and under "element," select "Production Quantity"; then click "show data) (last updated May 17, 2011). Brazil's primary ethanol feedstock is sugarcane. *Biofuels for Transportation: Global Potential and Implications for Sustainable Agriculture and Energy in the 21st Century*, Worldwatch Inst., 5 (June 6, 2007), [hereinafter *Biofuels for Transportation*], http://www.worldwatch.org/system/files/EBF038.pdf.

a global share of nearly 89% in 2008, primarily uses rapeseed oil.[19] In other areas, ethanol is produced from soy oil, sunflower oil, palm oil, or *Miscanthus giganteus*, a relative of sugar cane native to East Asia.[20] Global ethanol production doubled, and biodiesel production expanded nearly fourfold in the European Union between 2000 and 2005.[21] In the United States, research is being conducted into how to get more useable substances from the domestic cropland, such as harvest leftovers like corn stover.[22] Ethanol and other fuels made from stover are called cellulosic biofuel, which can be made from numerous grasses and plantlife.[23] Thus, the search is on for the most efficient source of cellulose that requires minimal land use, water, and fertilizer input, and is easy and inexpensive to convert into biofuel. This is where algae come in.

II. ALGAL BIOFUELS

A. MAKING FUEL FROM ALGAE

The wide array of research projects, government studies, and corporate experiments on making fuel from algae bespeak the difficulty of describing exactly what "algal biofuel" is and how it is made; however, some general explanations are safe. For example, feedstock algae comes from three different groups of organisms, including microalgae (pond scum being a well-known example), macroalgae (seaweed), and cyanobacteria (blue-green algae)."[24] These algae occur naturally in a variety of habitats ranging from freshwater and seawater to hyper-saline environments, and there are tens of thousands of known species with potentially thousands more unknown ones.[25] Furthermore, many groups attempting to establish viable biofuel production procedures and facilities are engaging in cross-breeding and genetic modification using biotechnology to develop the most abundant, affordable, productive, and sustainable feedstocks.[26]

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19 Rudolf M. Smaling, *Environmental Barriers to Widespread Implementation of Biofuels*, 2 ENVTL. & ENERGY L. & POL'Y J. 287, 289 (2008).

20 *See Biofuels for Transportation*, *supra* note 18, at 7; S, Sumathi, et al., *Utilization of Oil Palm as a Source of Renewable Energy in Malaysia*, 12 RENEWABLE & SUSTAINABLE ENERGY REV. 2404 (2008); D.G. Christian, et al., *Growth, Yield, and Mineral Content of* Miscanthus x Giganteus *Grown as a Biofuel for 14 Successive Harvests*, 28 IND. CROPS & PROD. 320 (2008).

21 Smaling, *supra* note 19.

22 Madhu Khanna, *Cellulosic Biofuels: Are They Economically Viable and Environmentally Sustainable?*, 23 CHOICES, AGRIC. & APPLIED ECON. ASSOC. 16 (2008) (discussing the viability of corn stover using Illinois data). Corn stover is the leaf, husk, and cob residue remaining in the field after the plant is harvested.

23 *Id.*

24 *See generally National Algal Biofuels Technology Roadmap*, U.S. DEP'T OF ENERGY, ii (May 2010) [hereinafter *Roadmap*], http://www1.eere.energy.gov/biomass/pdfs/algal_biofuels_roadmap.pdf.

25 *See* John Sheehan et al., *A Look Back at the U.S. Department of Energy's Aquatic Species Program: Biodiesel from Algae*, NAT'L RENEWABLE ENERGY LAB., 2-3 (July 1998), http://www.nrel.gov/docs/legosti/fy98/24190.pdf.

26 Such groups include Verno Systems, Sapphire Energy, and Synthetic Genomics. *See* Dina Fine Maron, *The Race to Make Fuel Out of Algae Poses Risks as Well as Benefits*, N.Y. TIMES, July 22, 2010, http://www.nytimes.com/cwire/2010/07/22/22climatewire-the-race-to-make-fuel-out-

Once a feedstock is selected, a cultivation method must be chosen. Generally, cultivation can be done photoautotrophically or heterotrophically and in open or closed ponds.[27] Most algae trials have employed photoautotrophic cultivation methods, which require sunlight for growth and creation of new biomass. Other trials employ heterotrophic cultivation, whereby "algae are grown without light and fed a carbon source, such as sugar, to generate new biomass."[28] Heterotrophic cultivation is expensive and decreases the algae's stated benefit of not requiring much land mass, due to the need for sugar.[29] While heterotrophic cultivation is performed in closed bioreactors, phototrophic growth can use either open bioreactors, shallow ponds, or closed photobioreactors.[30]

The U.S. Department of Energy's (DOE) Aquatic Species Program studied the creation of renewable transportation fuels from algae from 1978 until funding was eliminated in 1996.[31] The program quickly focused exclusively on the use of open, shallow ponds circulating algae in a continuous loop.[32] According to the program's scheme, paddlewheels are used to provide a flow so that algae remain suspended, and nutrients and carbon dioxide are bubbled into the pond to be captured by the algae.[33] This has been dubbed the "raceway" design.[34] The French, German, and Japanese governments have invested significantly in research and development of closed bioreactor designs, some of which use optical-fiber-based reactor systems to supply the necessary light.[35] A new concept in closed systems is vertical growth, wherein algae are placed in clear plastic bag-like containers and hung on multi-tiered racks, so as to be exposed to sunlight from two sides at once.[36]

Closed systems have both advantages and disadvantages over open systems. First, closed systems are not as easily subject to contamination as open systems; however, closed photobioreactors are considered "unlikely to be sterilizable and may require periodic cleaning due to biofilm formation," which inhibits sunlight penetration.[37] This may or may not be better for long-term culture maintenance. Also, closed systems lose much less water to evaporation, which can add up to several hundred gallons of water lost per gallon of algal biofuel grown in open ponds, according to one estimate.[38] Despite these advantages, closed systems do not receive the associated benefit of evapora-

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of-algae-poses-ris-80037.html?pagewanted=all; *see also* Stephen Lacey, *Are Genetically Modified Algae a Threat?*, Renewable Energy World (Apr. 1, 2011, 1:18 PM), http://www.renewableenergyworld.com/rea/news/podcast/2011/04/are-genetically-modified-algae-a-threat.

27 *Roadmap*, *supra* note 24, at iv.

28 *Id.*

29 *Id.* at 30. Farming the sugar, after all, requires land.

30 *Id.* at 74.

31 Sheehan, *supra* note 25, at i.

32 *Id.* at 3-4.

33 *Id.* at 4.

34 *Id.*

35 *Id.* at 5.

36 Valcent Products and Global Green Solutions are using this method. *See* Guner, Lori, *Algae, the Next Great Biofuel – Vertigro Energy*, The Alt. Consumer (Oct. 17, 2007, 12:34 AM), http://www.alternativeconsumer.com/ 2007/10/17/algae-the-next-great-biofuel-vertigro-energy.

37 *Roadmap*, *supra* note 24, at 29.

38 *Id.* at 79 (based on hypothetical evaporative loss estimated for a scale-up scenario study).

tive cooling, so temperatures must be carefully maintained.[39] Additionally, potential maximum productivity volumes and volumetric cell densities are higher for closed photobioreactors than for open systems because the surface-to-volume ratio can be higher.[40] This increases the amount of sunlight reaching the product while decreasing the amount of water that must be processed, and thus decreasing the cost of harvest.[41] Still, both types of systems are limited by the amount of sunlight they can access in a day.

Currently, closed photobioreactors are significantly more expensive to construct and suffer from problems of scalability, especially with regard to mixing and gas exchange for both carbon dioxide and oxygen.[42] However, closed systems have not been as thoroughly engineered as other types of systems, so scalability solutions and significant cost reductions could present themselves in the future.[43] Thus far, the raceway design seems to be the most popular among commercial investors, possibly because of the consensus that it is the cheapest to build and operate.[44] Cultivation issues still need to be explored in both open and closed systems and will likely not be fully resolved until large-scale systems are built and operated for substantial periods of time.[45]

After the algae are cultivated, they must be harvested, extracted, and converted into fuel. To harvest, the aqueous solution in which the algae are suspended must somehow be drained.[46] Draining is done through various combinations of sedimentation, filtration, centrifugation, drying, and natural or chemically induced flocculation—i.e., the coagulation of small particles into larger flakes and clusters.[47] Chemical additives capable of binding algae in the chemically induced flocculation process include alum, lime, cellulose, salts, and surfactants.[48]

After harvesting, three major components can be extracted from algal biomass by means of pressing and chemical procedures: carbohydrates, proteins, and high-energy lipids from the natural oils.[49] The carbohydrates can be fermented into ethanol or turned into methane, butane, or other hydrocarbons by means of gasification.[50] The lipids can be processed into biodiesel via transesterification or into gasoline, jet fuel,

39 *Id.* at 29.
40 P.M. Schenk et al., *Second Generation Biofuels: High-efficiency Microalgae for Biodiesel Production*, 1 BIOENERGY RES. 20, 30 (2008).
41 *Id.*
42 *Roadmap*, *supra* note 24, at 29.
43 *Id.* at 29-31, 118. Scalability describes a system's ability to cope with an expanding network.
44 *See id.* at 29-30.
45 *Id.*
46 *See generally id.* at 37-39 (providing extensive, detailed explanations of the harvesting process).
47 *Id.*
48 *Id.* at 37.
49 *Id.* at v.
50 *Id.* at 65.

or biodiesel via catalytic hydroprocessing.[51] Various co-products can be made from the proteins, including animal feed, fertilizers, bioplastics, and nutraceuticals.[52]

It is also worth mentioning at this point that a few groups are experimenting with getting algae to act as both feedstock and processor, synthesizing and secreting ready-to-use fuels.[53] The focus of biologist Anastasios Melis and his team at the University of California at Berkeley is "product generation directly from photosynthesis, and spontaneous product separation from the organism, bypassing the need to harvest and process the respective biomass."[54]

B. Benefits of Algal Biofuel

If the entire 2007 U.S. soybean oil yield, the product of 63.6 million acres of farmland, was made into biofuel, it would only produce enough to replace about 4.5% of the total annual demand for petroleum diesel.[55] Conversely, using that much land to cultivate algae could generate enough biofuel to supplant 61% of the petroleum diesel used annually, as well as recycling approximately 2 billion tons of carbon dioxide.[56] These statistics illustrate two of the remarkable benefits of algal biofuel as compared to other biofuel sources. First, algae production requires much less land—non-productive, non-arable land, at that—than traditional biofuel sources. Algae can even be grown without soil, as is the case with experimental sea-farmed macroalgae.[57] This low acreage demand is partly accounted for by algae's high efficiency productivity.[58] Species studied in the U.S. Aquatic Species Program can produce up to 60% of their body weight in lipids.[59] This means that algae production on less than 0.1% of the climatically suitable land areas in the U.S. could produce one quadrillion Btus of energy[60]— roughly 1% of the nation's total 2008 energy consumption.[61] It must be

51 *Id.* at 54. Trasesterification is a chemical process that changers lipids into fuel. *Id.* Catalytic hydroprocessing removes pollutants from fuel oils or breaks down large hydrocarbon molecules into molecules that can be used as fuel oils. *Id.* at 57.

52 *Id.* at 61; *see also* Sheehan, supra note 25, at 256-56. A nutraceutical is any substance that is a food or food product that provides health benefits.

53 *See Directory: Using Green Algae to Produce Hydrogen from Sunlight and Water via Photosynthesis*, Pure energy Systems Wiki, http://peswiki.com/index.php/ Directory:Using_green_algae_to_produce_hydrogen_from_sunlight_and_water_via_photosynthesis (last visited Sept. 25, 2011).

54 Anastasios Melis, Dep't of Plant & Microbial Biology, Univ. of Cal., Berkeley, http://pmb.berkeley.edu/profile.anastasios-5106426209# (last visited Oct. 30, 2010).

55 Phillip T. Pienkos & Al Darzins, *The Promise and Challenges of Microalgal-derived Biofuels*, 3 Biofuels, Biproducts & Biorefining 431, 433 (2009), *available at* http://www.afdc.energy.gov/afdc/pdfs/ microalgal_biofuels_darzins.pdf.

56 *Id.*

57 Bio Architecture Lab is one company focused on aquafarmed macroalgea, http://www.ba-lab.com (last visited Sept. 25, 2011).

58 Pienkos & Darzins, *supra* note 55, at tbl. 1.

59 Sheehan, *supra* note 25, at 6.

60 *Id.* at 13.

61 *How Much of the World's Energy Does the United States Use?*, U.S. Energy Info. Admin., http://www.eia.doe.gov/ask/generalenergy_faqs.asp (last updated June 1, 2011) (estimating U.S. primary energy consumption as 101 quadrillion Btu in 2008).

noted that, though it is comparably low in demand for land when compared to traditional biofuel sources, even the most productive microalgal biofuel systems will require roughly 800-2600 acres of algae culture surface area to produce ten million gallons of oil feedstock.[62]

A second benefit of algal biofuel is its potential for carbon dioxide mitigation. Algae require carbon dioxide to produce biomass; algae farms can be integrated with power plants and other stationary sources of emissions to capture and mitigate the carbon dioxide from flue gas and other origins. Of course, carbon dioxide is still released when the algal-derived fuel is combusted, but this amounts to recycling carbon dioxide prior to its release.[63] This has the potential of increasing the amount of energy produced per unit of carbon dioxide released by up to 60%.[64] Algal biodiesel is one of the only avenues available for high volume re-use of carbon dioxide generated in power plants,[65] but it could also be employed at cement and chemical plants, oil refineries, and petroleum-processing plants, all of which together represent over half of Americans' annual carbon dioxide emissions of more than six billion metric tons.[66] Some 22%–30% of a plant's greenhouse gas emissions can be offset by algal biofuel, according to current estimates.[67]

The ability of algae to grow in brackish water means that algae development need not further strain freshwater supplies needed for domestic, industrial, and agricultural uses.[68] Additionally, this saline compatibility allows algae to be grown in seawater as well as areas of the country in which brackish groundwater prevents other useful land applications. This is an advantage over other biofuel crops, which generally require abundant freshwater.[69] It also means that algal biofuels are not competing with food sources for land or freshwater. Unfortunately, quantitative and qualitative information on the extent, location, and quality of the brackish and saline groundwater resources is presently limited, so it is hard to say exactly to what extent algal biofuel production could rely on these sources.[70]

A related benefit of cultivating algae for biofuel is its use in sewage treatment. Algae can filter out organic matter, heavy metals, excess nutrients, hormones, antibiotics, and/or chemicals.[71] Algae are already being used in wastewater treatment facilities across the country to provide oxygen for the bacterial breakdown of organic materials and to sequester nitrogen and phosphorous, both of which algae need to create bio-

62 *Roadmap*, *supra* note 24, at 81.

63 Pienkos & Darzins, *supra* note 55.

64 *Id.* at 438.

65 *Roadmap*, *supra* note 24, at 3.

66 *Id.* at 80.

67 D.E. Brune et al., *Microalgal Biomass for Greenhouse Gas Reductions: Potential for Replacement of Fossil Fuels and Animal Feeds*, 135 J. ENVTL. ENG'G, 1136, 1136 (2009).

68 *Roadmap*, *supra* note 24, at 33-34.

69 *See* R. Dominguez-Faus et al., *The Water Footprint of Biofuels: A Drink or Drive Issue?*, 43 ENVTL. SCI. & TECH. 3005, 3005 (2009); *see also* Goran Berndes, *Bioenergy and Water–the Implications of Large-Scale Bioenergy Production for Water Use and Supply*, 12 GLOBAL ENVTL. CHANGE 253, 259 tbl.2 (2002).

70 *See Roadmap*, *supra* note 24, at 79-80. Current saline groundwater maps are based on incomplete data compiled by the USGS prior to the mid-1960s. *Id.*

71 *Id.* at 83-84.

mass.[72] This benefits both processes, since the wastewater helps offset the potentially high costs of commercial fertilizers and nutrients for algae production, which are a key issue in achieving the affordable and sustainable scale-up of algal biofuel facilities.[73]

Algal biofuel production also produces plentiful, useful co-products. These range from fertilizers to animal feed, coloring agents to cosmetics, biodegradable plastics to surfactants, and pharmaceuticals to health food supplements (most famously vitamin-rich *spirulina*).[74] Several of these are high-value products (as opposed to commodities), valued at $0.30–$1 per pound.[75] In many cases, the co-products actually make algal biofuel production cost effective in the short term while production prices are still high due to lack of economies of scale, although current markets are of limited capacity.[76] The global value of non-fuel macroalgae products alone was estimated in 2003 to be $5.5–6 billion.[77] Lastly, the sheer variety of fuels that can be made from algae is an advantage over more traditional biofuel feedstocks.

C. The Future of Algal Biofuel

Around the world, governments and private industries foresee renewable energy as the future, and pressure is mounting to build biofuel capacity now. The European Union has established a binding target of 20% of overall energy consumption to come from renewable energies by 2020, with Member State targets of 10% of transport gasoline and diesel to be comprised of biofuels by that year.[78] In the U.S., Congress established a Renewable Fuels Standard (RFS) Program as part of the 1991 Clean Air Act (CAA) amendments, which mandates minimum volumes of various categories of renewable fuels to be used each year, with annual increases.[79] Almost 13 billion gallons of total renewable fuels were required for 2010.[80] In February 2010, the Environmental Protection Agency (EPA), in issuing final regulations under the RFS Program, clarified its determination that diesel made from algae qualifies for the "biomass-based diesel" category, 1 billion gallons of which will be required under the RFS by 2012.[81] Furthermore, a bill was introduced during the 2009 Congressional session to amend the renewable fuel program to include algae-based biofuels in the cellulosic biofuel producer tax credit.[82] While that bill failed to pass, such benefits could be extended

72 *Id.*

73 *Id.* at 83.

74 *Id.* at 61-64; Sheehan, *supra* note 25, at 256-57 (discussing the development of large-scale of *spirulina*, a filamentous, blue-green alga).

75 *Roadmap, supra* note 24, at 61.

76 *Id.*

77 *Id.* at ex. 7.3.

78 Council of the Eur. Union, Presidency Conclusions of the Brussels Eur. Council, 21 (2007), *available at* http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/93135.pdf.

79 Clean Air Act § 211(o)(2), 42 U.S.C. § 7545 (2010).

80 *Id.*

81 *EPA Finalizes Regulations for the National Renewable Fuel Standard Program for 2010 and Beyond*, Envtl. Prot. Agency Office of Transp. & Air Quality, 4-5 (Feb. 2010), http://www.epa.gov/oms/renewablefuels/420f10007.pdf.

82 H.R. 3460, 111th Cong. § 2 (2009).

to algal biofuels in the near future, thus increasing the incentive for expansion in the industry.

Governmental agencies and industry groups, perhaps encouraged by such supportive legislation, are directing investment towards algae. Federal interest is indicated by the algal biojet program at the Air Force, which aimed to have an entire fleet certified to fly on biofuels by 2011 and has already flown test flights with a fifty-fifty plant-based biofuel and jet fuel mix.[83] Federal programs specifically targeting algal-derived biofuels also demonstrate the high level of current governmental interest. These include programs at the DOE's Office of Energy Efficiency and Renewable Energy and Office of Fossil Energy, along with the DOE's recent announcement on the selection of two university algal biofuels projects for funding.[84]

The Algal Biomass Organization, a trade group, now has over 170 members—all private companies established for the purpose of developing algal biofuels.[85] ExxonMobil, one of the last major oil companies to commit to biofuels, in 2009 announced a partnership with Synthetic Genomics Incorporated entailing hundreds of millions of dollars in investment in photosynthetic algae for fuel purposes.[86] In fact, the private sector has committed an estimated 1 billion dollars to developing algae-based fuels.[87] Indeed, many companies claim to be ready for commercial-scale production. For instance, on October 22, 2010, the U.S. Navy conducted a full-power demonstration of pre-tested algae-based ship fuel supplied by the San Francisco-based company Solazyme, Inc.[88] The company received a $21.8-million federal grant in December 2009 to build its first integrated biorefinery, located in Pennsylvania, for commercial scale production of algal biofuel.[89] In September 2010, the Navy ordered 150,000 gallons of ship and jet fuel from Solazyme.[90]

Eager to get into this potentially lucrative field, Texas has been doing numerous things to encourage biofuel development within the state. In December 2009, the Legislature created the Texas Bioenergy Policy Council (TBPC) and Texas Bioenergy Research Committee (TBRC) to "promote the goal of making biofuels and bioenergy a significant part of the energy industry in Texas."[91] TBPC is meant to foster the devel-

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83 Elisabeth Rosenthal, *U.S. Military Orders Less Dependence on Fossil Fuels*, N.Y. TIMES, October 4, 2010, http:// www.nytimes.com/2010/10/05/science/earth/05fossil.html?pagewanted=all.

84 Pienkos & Darzins, *supra* note 55, at 436.

85 *2009 Annual Report*, ALGAL BIOMASS ORG., 2 (June 2010), http://www.algalbiomass.org.

86 Katie Howell, *Exxon Sinks $600M Into Algae-Based Biofuels in Major Strategy Shift*, N.Y TIMES, July 14, 2009, http://www.nytimes.com/gwire/2009/07/14/14greenwire-exxon-sinks-600m-into-algae-based-biofuels-in-33562.html.

87 Pienkos & Darzins, *supra* note 55, at 437.

88 *See* William Jamieson, *Navy Demonstration Highlights Biofuels Capability*, U.S. DEP'T OF DEF., Oct. 25, 2010, http://www.defense.gov/news/newsarticle.aspx?id=61398; Press Release, Solazyme, Navy Demonstrates Solazyme's Soladiesel HRF-76 Renewable F-75 Fuel (Oct. 22, 2010) (http://www.solazyme.com/media/2010-10-22).

89 Jason Dearen, *Military, Government Increase Investment in Algae Fuels*, ASSOCIATED PRESS, Oct. 27, 2010, *available at* http://seattletimes.nwsource.com/html/nationworld/2013266233_apusalgaefuelsusnavy.html.

90 *Id.*

91 4 TEX. ADMIN. CODE §1.212(a) (2011) (Tex. Dep't of Agric., Texas Bioenergy Policy Council and Committee).

opment of cellulosic and bio-based fuels, facilitate the creation of a biofuels research program at a Texas university, and obtain funding for Texas biofuel work, among other activities.[92] Among other requirements, TBRC is specifically directed to study the potential for producing oil from algae.[93]

Texas's Emerging Technology Fund (TETF) has been handing out grants to companies studying or associated with algal biofuels.[94] Photon8, a company working with the University of Texas at Brownsville and Texas Southernmost College to develop a special bioreactor, is one of those recipients.[95] Sunrise Ridge Algae, another recipient, operates a pilot production facility in Austin, Texas, and partners with the University of Texas at Austin and the University of Houston.[96]

Algae were studied in Texas even before the creation of the TETF, TBPC, or TBRC. In fact, the University of Texas at Austin houses one of the largest collections of algae samples in the world at its Culture Collection of Algae, which has been involved with algae research since 1976.[97] Another Texas university, Lone Star College, has partnered with the National Algae Association in a planned commercial-scale photobioreactor, harvester, and extraction system.[98] They hope to have the first completed commercial-scale demonstration system in the United States at their Montgomery campus.[99]

Several algal biofuel companies currently have or are planning to build facilities in Texas. These include a demonstration plant in Pecos run by General Atomics and Texas AgriLife, which seek to develop technologies and processes to allow farmers and other landowners to supply algae to fuel-processing facilities, similar to those available to the corn ethanol industry.[100] Algenol Biofuels Incorporated is collaborating with Dow Chemical in construction of a pilot plant in Freeport to produce 100,000 gallons of ethanol annually from algae.[101] Joule Biotech plans to operate a facility to use wastewater to produce ethanol and biodiesel and anticipates production of 25,000 gallons/acre/year of ethanol and 15,000 gallons/acre/year of biodiesel.[102] Valcent Products has commissioned the world's first commercial-scale bioreactor pilot project at its test facility in El Paso, where Valcent and another company, Global Green Solutions,

92 *Id.* § 1.212(b)(2)-(3).

93 *Id.* § 1.212(c)(4).

94 *Emerging Technlogy Fund*, Office of the Governor Rick Perry, http://governor.state.tx.us/ecodev/etf/ etf_awards (last visited Sept. 26, 2011).

95 *Texas Bioenergy 2010 Status Report*, Tex. Dep't of Agric., 27-26 (Sept. 2010) [hereinafter *Texas Bioenergy Status Report*], http://www.agr.state.tx.us/vgn/tda/files/1848/ 40613_Texas%20Bioenergy%20Status%20Report%202010.pdf.

96 *Id.* at 27.

97 *History, Structure, and Purposes of UTEX*, Culture Collection of Algae at The Univ. of Texas at Austin, http://web.biosci.utexas.edu/utex/insideUtex.aspx (last visited Oct. 31, 2010).

98 *Texas Bioenergy Status Report*, *supra* note 95, at 27.

99 *Id.*

100 *Id.* at 26.

101 Jennifer A. Dlouhy, *Federal Money Set to Flow to Renewable Fuel Projects*, Houston Chron., Dec. 5, 2009, http://www.chron.com/disp/story.mpl/business/6754306.html.

102 Press Release, Joule Unlimited, Joule Biotechnologies Secures Pilot Site for Renewable Solar Fuel (January 20, 2010) (http://www.jouleunlimited.com/news/2010/joule-biotechnologies-secures-pilot-site-renewable-solar-fuel).

are collaborating in a joint venture to extract biodiesel fuel from algae.[103] PetroSun has commenced operations at a 1,100-acre algae farm in Rio Hondo, with 20 acres dedicated to algae ponds, anticipating production of upwards of 4.4 million gallons of algal oil annually from which the company hopes to produce algae-derived jet fuel.[104]

The significant investments of these and other companies and universities, as well as the strong governmental support for algal biofuels, indicate that the industry will have a strong presence in Texas for the foreseeable future. Moreover, according to indicators, with "improved biological productivity and fully integrated production systems, ... algal biofuels can be competitive with petroleum at approximately $100 per barrel."[105]

III. THE REGULATORY FRAMEWORK

A mixed bag of regulations govern the algal biofuel industry in the United States. Depending on the characteristics of the alga used and the processes undertaken, a variety of regulations administered by a hodgepodge of agencies may apply just at the federal level. In Texas, algae are regulated by the Texas Parks and Wildlife Department, but the facilities and processes used to turn them into biofuel are subject to Texas Commission on Environmental Quality (TCEQ) regulations. Local and county regulations must also be heeded. It is worth bearing in mind that few laws specifically address algal biofuel. Industry participants must examine the underlying regulatory regime and attempt to determine which aspects apply to their particular species and activities.

A. FEDERAL REGULATION OF ALGAE

A number of federal regulatory agencies may govern a given aspect of algal biofuels. This is especially true with regard to genetically engineered algae, considering the Coordinated Framework for Regulation of Biotechnology (CFRB) introduced in 1986 by the White House Office of Science and Technology Policy.[106] The CFRB established the first U.S. regulatory policy for ensuring the safety of biotechnology research and products by working within the existing product regulation law to create a system of oversight for biotechnology; the responsibility is shared among EPA, Food and Drug Administration (FDA), and Department of Agriculture (USDA).[107]

103 *Crops for Fuel*, ST. ENERGY CONSERV. OFFICE, http://www.seco.cpa.state.tx.us/re_biomass-crops.htm (last visited Sept. 26, 2011).

104 Press Release, PetroSun, PetroSun Issues Algae-to-Biofuels Corporate Updates (Mar. 24, 2008) (http://www.marketwire.com/press-release/petrosun-issues-algae-to-biofuels-corporate-updates-835410.htm).

105 *Roadmap*, *supra* note 24, at 104.

106 Coordinated Framework for Regulation of Biotechnology, 51 Fed. Reg. 23,302-01 (June 26, 1986).

107 *Id.* at 23,303.

FDA is responsible for protecting public health with regard to drugs, cosmetics, and the nation's food supply.[108] Due to its limited scope, FDA oversight is only relevant to algal biofuel production with regard to certain co-products of the process.

EPA has a more direct role under its implementation of the Toxic Substances Control Act (TSCA).[109] TSCA is meant to be the regulation of last resort—only relevant if and when the substance at issue is intended to be used for a purpose which is not otherwise subject to federal regulation (e.g., as a pesticide under the Federal Insecticide, Fungicide, and Rodenticide Act or as a food additive under the FDA Act).[110] TSCA applies to "new" chemicals, meaning those that are not already manufactured or processed in the U.S.[111] It requires companies or individuals to notify EPA at least 90 days before commencing manufacture or importation of such chemicals in order to identify those chemicals that appear to pose potentially unacceptable risks to the environment or public health.[112] The burden of proving either insufficient data or an unreasonable risk rests with EPA.[113] That is to say, the applicant only has to establish a *prima facie* case for the safety of the chemical.[114] Unless EPA can prove that the chemical is unsafe, the chemical is approved by default.[115]

EPA has extended TSCA oversight to commercial and research activities involving microorganisms by defining "chemical substance" broadly to include microorganisms.[116] However, TSCA pre-manufacture reporting requirements only apply to a "new microorganism," which is further limited to an "intergeneric microorganism."[117] In other words, the requirements apply only to "a microorganism that is formed by the deliberate combination of genetic material originally isolated from organisms of different taxonomic genera."[118] Under TSCA, the term "microorganism" encompasses red and green algae (i.e., microalgae and macroalgae, although notably not cyanobacteria).[119] Under this formulation, microorganisms that are not intergeneric—including naturally occurring and classically mutated or selected microbes, as well as genetically modified microbes whose genetic material originates in a single genus—are not considered to be new and are exempt from TSCA's reporting requirements.[120] To clarify: only those micro- and macroalgal species that have been purposefully cross-

108 *What Does FDA Do?*, U.S. Food & Drug Admin., http://www.fda.gov/aboutfda/transparency/basics/ ucm194877.htm (last updated Dec. 17, 2010).

109 Toxic Substances Control Act, 15 U.S.C. §§ 2601-2629 (2010).

110 *Id.* § 2602(2) (specifically excluding substances controlled by other regulations).

111 *Id.* §§ 2602(9), 2607(b).

112 *Id.* § 2604(a); *see* Microbial Products of Biotechnology; Final Regulation Under the Toxic Substances Control Act, 62 Fed. Reg. 17,910, 17,913 (Apr. 11, 1997).

113 *See* William H. Rodgers, Jr., Environmental Law §6:1(B) (2006 ed. Supp. 2011).

114 *See id.*

115 *See id.*

116 15 U.S.C. § 2602(2); *see* Microbial Products of Biotechnology, 62 Fed. Reg. 17,909, 17,911 (Apr. 11, 1997).

117 40 C.F.R. § 725.3 (2010), Microbial Products of Biotechnology, 62 Fed. Reg. at 17,913.

118 40 C.F.R. § 725.3.

119 *Id.*; *see* Microbial Products of Biotechnology, 62 Fed. Reg. at 17,926.

120 *See Microbial Products of Biotechnology: Summary of Regulations under the Toxic Substances Control Act*, Envtl. Prot. Agency, http://www.epa.gov/biotech_rule/pubs/pdf/fs-002.pdf (last visited Sept. 26, 2011).

bred or genetically modified to include genes from more than one genera fall under TSCA.

Research activities where microorganisms are used entirely within "contained structures" are also exempt from TSCA requirements, under the provision for research and development using only "small quantities" of chemicals (which specifically contemplates fermenters and bioreactors).[121] Thus, the few groups using closed systems and working with those algae species that fall under TSCA have been exempt from reporting requirements; however, these groups will need TSCA approval to expand to commercial-scale production. Those using open systems have presumably already passed this hurdle, since their organisms are not within contained structures. Those utilizing naturally occurring species or species from a single genus need not even consider it. Thus, TSCA's reporting requirement is not much of a check on industry's use of algae, as the large majority of chemical notifications received by EPA under TSCA are cleared within 90 days, after only brief agency review.[122]

USDA is another potentially relevant agency. USDA could conceivably regulate algal biofuels through the Federal Plant Protection Act (FPPA) and its directives regarding plant pests.[123] Under this scheme, USDA directs the Animal and Plant Health Inspection Service (APHIS) in administering permitting of the "plant pests" listed in the Code of Federal Regulations.[124] Species without genes from any of the listed plants are free from regulation. By definition, listed plants are not authorized without a permit; however, according to one consulting company specializing in biotechnology, "[t]his list does not appear to include the names of any of the genera of algae that have been suggested for biofuel use."[125] Application of the FPPA to algae is determined based on the genetic makeup of the algae in question.[126]

There is one publicly-known case of a company requesting a USDA ruling specifically addressing FPPA's applicability to their engineered algae (albeit, the algae were used for aquaculture, not biofuels). In its 2008 letter to the company, Coastal BioMarine, USDA provided useful insights into its understanding of its regulations.[127] First, USDA will analyze any genetically modified species for the "plant pest" list's applicability to both recipient and donor species.[128] Second, and highly important for the algal biofuel industry, USDA will not require oversight if the organisms are used

121 40 C.F.R. §§ 725.3, 725.234 (2010).

122 Premanufacture Notification, 48 Fed. Reg. 21,722, 21,722-24 (May 13, 1983); *see* Rodgers, *supra* note 113, at § 6:5(B)(1) (demonstrating that, historically, EPA takes no action on about 85% of premanufacture notices and grants post-notice exemptions from regulation to about 88% of applicants, allowing commercial production to proceed in both cases).

123 Plant Protection Act, 7 U.S.C. §§ 7701-7758 (2010).

124 7 C.F.R. § 340.2 (2010).

125 *Regulations Affecting the Use of Genetically Modified Algae for Biofuel Production*, D. GLASS ASSOC., INC., (June 09, 2010, 7:55 PM), http://dglassassociates.wordpress.com/2010/06/09/regulations-affecting-the-use-of-genetically-modified-algae-for-biofuel-production-2.

126 7 C.F.R. § 340.2 (2010).

127 Letter from Michael C. Gregoire, Deputy Administrator, U.S. Dept. of Agric., to Loy Wilkinson, Coastal Biomarine (May 19, 2008), (http://www.coastalbiomarine.com/UserFiles/File/Coastal%20Marine%20opinion%20letter%205%2019%2008.pdf).

128 *Id.*

in a closed reactor.[129] Last, large-scale use of such organisms *could* raise environmental issues that would trigger USDA oversight, but an applicant could petition to establish non-regulated status for the organism.[130]

USDA also proposed rules under APHIS specifically addressing genetically modified organisms (GMOs) that could affect biofuel algae species.[131] Proposed in 2008, genetically engineered plants would be subject to FPPA regulations if

> (i) [t]he unmodified parent plant from which the [Genetically Engineered, or] GE plant was derived is a plant pest . . . , or (ii) [t]he trait introduced by genetic engineering could increase the potential for the GE plant to be a plant pest . . . , or (iii) [t]he risk that the GE plant poses as a plant pest . . . is unknown, or (iv) [t]he Administrator determines that the GE plant poses a plant pest . . . risk.[132]

It is foreseeable that many GMO algae could be closely scrutinized under the third alternative, unknown risk, since their potential characteristics outside the laboratory are likely undetermined.

In any case, application of FPPA means groups intending to use the algae for research or commercial purposes must apply for a permit if the algae will be moved interstate or released into the environment.[133] During the permitting process APHIS considers many factors, including the plant's effects on human health, the possibility for the plant's propagation or persistence outside of the planned boundaries, the plant's potential for threatening native plant and animal communities if it gets out, and the risks to threatened and endangered species of any such release.[134] Unauthorized or accidental movements or releases can result in destruction or quarantine of the offending organism and longer-term measures.[135] Fines of up to $500,000 and the possibility of criminal prosecution are authorized for serious infractions.[136]

Lastly, in terms of federal regulation, future action is possible. In 1999, President Bill Clinton signed Executive Order 13112 (EO 13112) regarding invasive species.[137] EO 13112 addresses the release or escape of non-native species (which presumably includes GMOs in addition to species not historically present in an area) and directs all federal agencies to prevent, detect, and respond to their introduction, as well as

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129 *Id.*

130 *Id.*

131 Importation, Interstate Movement, and Release Into the Environment of Certain Genetically Engineered Organisms, 73 Fed. Reg. 60,008, 60,011 (Oct. 9, 2008) (to be codified at 7 C.F.R. pt. 340).

132 *Id.*

133 7 C.F.R. § 340.4(c) (2010).

134 *See* National Environmental Policy Act Decision and Finding of No Significant Impact, Animal & Plant Health Inspection Serv. 3-4 (2010), *available at* http://www.aphis.usda.gov/brs/aphisdocs/ 08_014101r_ea.pdf.

135 7 C.F.R. 340.0(b) (2010).

136 *Biotechnology: Compliance and Inspections*, Animal & Plant Health Inspection Service, http://www.aphis.usda.gov/biotechnology/compliance_main.shtml (last modified Mar. 30, 2009).

137 Exec. Order No. 13,112, 64 Fed. Reg. 6,183 (Feb. 3, 1999).

not authorize or fund actions likely to cause their introduction.[138] Any federal agency considering promoting, funding, authorizing, or permitting algae use in biofuels needs to consider its responsibilities under EO 13112 and whether that alga species has the potential to become invasive. In the future, agencies could certainly create new rules to address any problems that may occur in that regard. With the exceptions of EPA and APHIS, however, agencies have so far mostly promulgated guidelines for what to do *after* a problem arises, rather than taking any preemptive action.

B. TEXAS ALGAE REGULATION

In Texas, biofuel production from algae falls under the jurisdiction of two state agencies. Texas Commission on Environmental Quality (TCEQ) regulates water use and discharges,[139] and Texas Parks and Wildlife Department (TPWD) regulates plant life and protects the state's flora and fauna.[140] Each agency regulates the industry both prior to production and in the event that there is any unforeseen environmental consequence.

Before any group can begin to cultivate a water-intensive organism such as algae, it must obtain a permit from TCEQ to appropriate the necessary water.[141] Using water in the state of Texas without a permit is punishable by fines of up to $5,000 for each day the use continues.[142] In addition, if the facility is expected to release any wastewater from the process, it must obtain a wastewater permit from TCEQ.[143] TCEQ runs the Texas Pollutant Discharge Elimination System (TPDES) under the supervision of EPA.[144] According to TCEQ's guidelines, "The ... [NPDES] program, as delegated to the State of Texas, requires permits for the discharge of pollutants from any point source to waters in the state."[145] The rules specifically list discharges *into* aquaculture projects as point sources requiring TPDES permits.[146] An "aquaculture project" is defined as "a managed water area which uses discharges of pollutants into that designated area for the maintenance or production of harvestable freshwater, estuarine, or marine plants or animals."[147] Pollutants are defined to include all of the inputs algae cultivation would or could require, including sewage, chemical wastes, biological materials, heat, sewer treatment facility discharges, and industrial waste, which would certainly capture the bare algae necessities of nitrogen and carbon dioxide.[148] Thus,

138 *Id.* at 6,184.

139 *Office of Water*, TEX. COMM'N ON ENVTL. QUALITY, http://www.tceq.texas.gov/about/organization/water.html (last modified Sept. 21, 2011).

140 TEX. PARKS & WILD. CODE ANN. § 12.001 (West 2011).

141 TEX. WATER CODE ANN. § 11.121 (West 2011).

142 *Id.* § 11.082.

143 30 TEX. ADMIN. CODE § 305.1(b) (2011) (Tex. Comm'n on Envtl. Quality, Scope & Applicability); TEX. WATER CODE ANN. § 26.121 (West 2011).

144 MEMORANDUM OF AGREEMENT BETWEEN THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 6: CONCERNING THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (May 5, 1998), *available at* http://www.tceq.state.tx.us/assets/public/permitting/ waterquality/attachments/general/c1.pdf.

145 30 TEX. ADMIN. CODE § 305.1(b).

146 *Id.* § 305.1(b)(1)(C).

147 *Id.* § 305.1(b)(1)(C) (citing 40 C.F.R. § 122.25(b)(1) (2010)).

148 *Id.* § 305.1(b) (citing TEX. WATER CODE ANN. § 26.001 (West 2011)).

any intake of water or release of pollutants into water for growing harvestable algae requires a permit. Any discharge into state water without a permit, even if accidental, can be criminally prosecuted and punished by a fine of up to $100,000 or imprisonment for as long as a year.[149]

The Texas Water Code authorizes TCEQ to deny permits when it finds that issuance would interfere with water-quality control, including "the propagation and protection of terrestrial and aquatic life."[150] More specifically, certain criteria are required for a TPDES permit to be issued to an aquaculture project.[151] The project must be intended either to produce a crop that has significant commercial value or for research into the production of such a crop.[152] The applicant must demonstrate that if the species to be cultivated is not indigenous to the immediate geographical area, adverse effects on the area's indigenous flora and fauna will be minimal.[153] Significantly, this requirement places the burden of proving the alga's harmlessness on the *applicant before* cultivation begins. As such, it may be Texas's most protective regulation. Lastly, the TCEQ Executive Director must determine that the crop will have no significant potential for human health hazards resulting from its consumption and that migration of pollutants from the designated project area to water outside the aquaculture project will not cause or contribute to a violation of water-quality standards.[154] All permits are then subject to limitations, monitoring and reporting requirements, and other conditions.[155] Since several facilities for the production of biofuel from algae are already operating in the state (so far, mostly research facilities), one may assume that obtaining a permit is reasonably practicable; however, were the alga to exhibit aggressive growth, toxicity, or otherwise threatening traits, it is foreseeable that new permits or permit renewals for existing facilities would not be forthcoming.

TPWD can also affect algal biofuel production by regulating which algae species can be used before production begins and later by suing for injunctive relief or civil penalties or to recover damages when there has been an unauthorized discharge that affects aquatic life or wildlife.[156] For purposes of this discussion, these discharges include algae, salt water, chemicals, or any "waterborne liquid, gaseous, or solid substances that result from any process of industry, manufacturing, trade, or business."[157]

TPWD has a mandate "to protect the state's fish and wildlife resources and an obligation to manage and control invasive aquatic vegetation and other nuisance species."[158] The Texas Parks and Wildlife Code states that "a person may not import, possess, sell, or place into the public water of this state an exotic harmful or

149 Tex. Water Code Ann. §§ 7.147, 7.187 (West 2011).

150 *Id.* §§ 26.003, 26.027(a).

151 30 Tex. Admin. Code § 308.21 (Tex. Comm'n on Envtl. Quality, Criteria for Issuance of Permits to Aquaculture Projects) (citing 40 C.F.R. § 125.11).

152 40 C.F.R. § 125.11(a)(1)(i) (2010).

153 *Id.* § 125.11(a)(3).

154 30 Tex. Admin. Code § 308.21 (citing 40 C.F.R. § 125.11(4)-(5)).

155 40 C.F.R. § 125.10(c).

156 Tex. Water Code Ann. § 26.001 (West 2011).

157 *Id.* § 7.109.

158 Letter from Carter Smith, Exec. Director, Tex. Parks & Wild., to Mark Vickery, Exec. Director, Tex. Comm'n on Envtl. Qual. (Sept. 9, 2010) (http://www.tceq.state.tx.us/assets/public/

potentially harmful aquatic plant except as authorized by rule or permit issued by the department."[159] "Exotic aquatic plant" is defined as a non-indigenous plant not normally found in aquatic or riparian areas of the state; this describes most biofuel algae species, which are, in most cases, brought into the state from elsewhere, if not altogether manufactured.[160] "Escape" from the plant into public water without a permit is specifically listed as a violation,[161] which is a class B misdemeanor the first two times it occurs and a felony thereafter.[162]

TPWD is charged with issuing exotic species permits and maintaining a list of exotic aquatic plants that are prohibited from importation into or possession in the state without a permit.[163] A recent change in the law makes an exception for "any microalgae imported, possessed, used, or sold for biofuel, academic, or research and developmental purposes.[164]

Finally, the Texas Legislature's creation of the Texas Bioenergy Policy Council and the Texas Bioenergy Research Committee in December 2009 evidences the legislators' intent to consider regulatory issues related to bioenergy more closely in the near future.[165] Presumably, these bodies will keep a close eye on the field and offer guidance to the Legislature.

IV. POTENTIAL PROBLEMS

The overarching concern about algal biofuels is that non-native and/or genetically modified algae will somehow be released—either intentionally or through accidental discharge—into the wild. This worry is not without merit, especially with regard to algae being cultivated in the open. In many cases, even though closed systems may be used, total algae filtration is extremely difficult due to its minute size, and alga release concomitant with the filtered water may be unavoidable.[166] Additionally, some algae strains can be transported in the air or on employees' skin and survive a variety of harsh conditions in its dormant stage.[167]

Concerns regarding potential algae "escape" have multiple aspects, many of which are part of the larger debate about GMOs in general. One concern is that cross pollination or similar processes will result in gene transfer to native species since the algae are often imported from another state or area.[168] Such "gene pollution" has the

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legal/rules/rule_lib/petitions/ 10058PET_petition.pdf); *see* TEX. PARKS & WILD. CODE ANN. § 66.0072.

159 TEX. PARKS & WILD. CODE ANN. § 66.0072(b) (West 2011).

160 *Id.* § 66.0072(a)(1).

161 *Id.* § 66.015(e).

162 *Id.* § 66.012(b).

163 *Id.* § 66.0072(c).

164 *Id.* § 66.0072(e).

165 Act of June 19, 2009, 81st Leg., R.S., ch. 506, § 4.03, sec. 50D, 2009 Tex. Gen. Laws 1144.

166 *Roadmap*, *supra* note 24, at 37. Microalgae and cyanobacteria considered for energy feedstocks may have cell diameters less than 10 micrometers. *Id.*

167 Maron, *supra* note 26.

168 *Synthetic Solutions to the Climate Crisis: The Dangers of Synthetic Biology for Biofuels Production*, FRIENDS OF THE EARTH, 9 (Sept. 2010) [hereinafter *Synthetic Solutions to the Climate Crisis*], http://www.foe.org/sites/default/files/ SynBio-Biofuels%20Report_Web.pdf.

potential to impart native plants with characteristics that were built or selected into the cultivated alga, with unforeseen consequences and possibly undesirable effects on wild populations.[169] For example, a commercial strain of algae may be bred to produce the maximum amount of lipids for biofuel use, but excess lipids may be harmful to the digestive systems of fish species relying upon native algae as a food source. Gene transfer was the concern of environmental groups, including Earthjustice and Sierra Club, when they challenged the permitting of genetically modified algae cultivation for "biopharmaceuticals" in Hawaii.[170] The groups were disquieted by the potential for effecting native strains unique to the islands.[171]

The National Invasive Species Council (NISC)—an advisory body made up of the Secretaries of State, Treasury, Defense, Interior, Agriculture, Commerce, and Transportation, and the EPA Administrator, and established by EO 13112—is concerned about a second possible problem with escape from cultivation: the risk that the algae or the affected native plants could become an invasive species.[172] The topical paper issued by NISC, "Biofuels: Cultivating Energy, not Invasive Species," points to the substantial economic and environmental impacts from some previous introductions of non-native species.[173] For example, cheatgrass displacing native grassland ecosystems across the West has dramatically altered the fire cycle.[174] Kudzu is known as "the plant that ate the South" because it has so rapidly taken over the southern U.S.[175] Estimated losses and control efforts due to invasive plants cost roughly $34 billion annually.[176] NISC has expressed concern that "a number of potentially harmful non-native algal species are being considered for use in the production of biodiesel, renewable biodiesel, and jet fuel (e.g. the toxic freshwater cyanobacteria, *Anabaena circinalis*)."[177] The theory is that, because these algae strains are bred to self-replicate and have no natural adversary in the area, once released into the environment they would be very hardy and could outcompete and displace native species, eventually overpopulating and reducing biodiversity.[178] Indeed, the very traits that maximize biofuel crop yield and foster the ability for biofuels to be cultivated in marginal environments, including perennial growth patterns and tolerance to salinity, increase the risk of invasiveness.[179]

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169 *Id.*

170 *Citizens Sue for Environmental Review of Biopharm Algae in Hawaii*, EARTHJUSTICE (Aug. 2, 2005), http://www.Earthjustice.org/news/press/2005/citizens-sue-for-environmental-review-of-biopharm-algae-in-hawaii.

171 *Id.*

172 *About NISC*, NAT'L INVASIVE SPECIES COUNCIL, http://www.invasivespecies.gov/main_nav/mn_about.html (last visited Sept. 25, 2011).

173 *Biofuels: Cultivating Energy, not Invasive Species*, NAT'L INVASIVE SPECIES COUNCIL, 3 (Aug. 11, 2009), http://www.invasivespecies.gov/home_documents/BiofuelWhitePaper.pdf.

174 David Pimentel et al., *Environmental and Economic Costs of Nonindigenous Species in the United States*, 50 BIO. SCI. 53, 55 (2000).

175 Rowan F. Sage et al., *Kudzu [*Pueraria Montana *(Lour.) Merr. Variety* Lobata*]: A New Source of Carbohydrate for Bioethanol Production*, 33 BIOMASS & BIOENERGY 57, 57 (2009).

176 Pimentel, *supra* note 174, at 54.

177 *Biofuels: Cultivating Energy, not Invasive Species*, *supra* note 173, at 2.

178 *Id.* at 3.

179 *Id.*

A third aspect of concern over algae "escaping" is the actual algae's immediate menace to other organisms. This is a particular worry with regard to those algae strains designed to act as both feedstock and processor, which secrete fuels directly.[180] The harms of algae secreting biofuels into the environment at large are self-evident. However, algae need not be fuel-secreting strains to pose a direct threat to other organisms. Several algae species are known to give rise to harmful algae blooms, including the red tide and brown tide species that produce toxins detrimental to plants and animals.[181] Even algae that do not produce toxins of any kind can produce fish kills and other aquatic life die-offs by decreasing available sunlight and by consuming the available oxygen in the water.[182]

The broadest concern with regard to algae "escaping" from biofuel facilities is the fundamental uncertainty surrounding their environmental effects. This largely has to do with the broad range of algae being used and scientific uncertainty over GMOs generally. Friends of the Earth, the Union of Concerned Scientists, and other organizations are particularly concerned because novel risks created by synthetic biology cannot be predicted.[183] Unpredictable ripple effects can follow the introduction of non-native species even if there is no GMO aspect involved. For example, species of domesticated fowl introduced in Hawaii brought along diseases such as avian malaria and bird pox, but there was no effect on native birds until non-indigenous wild pigs were later introduced. Uprooting the native vegetation, the pigs provided breeding grounds for mosquitoes coming from Mexico, which then spread the diseases to native birds, resulting in serious declines of native bird populations.[184]

Who is to say what may result if non-native algae escape from cultivation into the wild? With all the different varieties of algae being explored for use, and all the different options for cultivating them, scientific uncertainty looms large. Together with the potential for gene pollution, invasive species risks, and threats to other organisms, release of algae from biofuels facilities could be severely problematic.

V. POSSIBLE RESPONSES

A. CURRENT ANSWERS

With all of these concerns over the escape of algae, it would be nice if the biofuel producers would contain the threat themselves. The producers have ample reason to do so given the fears of liability and worries about potential consumer backlash. Consumers' adverse reactions have caused considerable corporate consternation among companies involved with GMOs since their inception. However, biofuel production

180 *Supra* note 50 (and accompanying text).

181 *Harmful Algae Blooms: Frequently Asked Questions*, TEX. PARKS & WILDLIFE DEP'T, http://www.tpwd.state.tx.us/landwater/water/environconcerns/hab (last visited Nov. 27, 2010).

182 *Id.*

183 *Synthetic Solutions to the Climate Crisis*, *supra* note 168, at 10; Margaret Mellon & Jane Rissler, *Environmental Effects of Genetically Modified Food Crops – Recent Experiences*, UNION OF CONCERNED SCIENTISTS (2003), *available at* http://www.ucsusa.org/food_and_agriculture/science_and_impacts/impacts_genetic_engineering/ environmental-effects-of.html.

184 Eric Biber, Note, *Exploring Regulatory Options for Controlling the Introduction of Non-Indigenous Species to the United States*, 18 VA. ENVTL. L.J. 375, 381-82 (1999).

operations may not entirely be able to stop algae from emigrating out of their facilities. It is often said that an ounce of prevention is worth a pound of cure, and federal and state authorities can stave off the most blatant algae troublemakers via the permitting process. But what can agencies currently do if algae break out?

USDA, through APHIS, runs a surveillance and rapid-response program for catching plant pests as early as possible.[185] APHIS works with state agriculture departments and universities to survey conditions in the states using the Cooperative Agricultural Pest Survey.[186] APHIS's Plant Protection and Quarantine program works to "safeguard . . . natural resources from the introduction, establishment, and spread of plant pests and noxious weeds" by providing leadership and coordination in emergency management.[187] All of this would hopefully facilitate early detection of any escaped algae that might cause harm and minimize the algae's effects on the natural landscape.

In Texas, TPWD monitors harmful algae.[188] In the event that algae get out and have some impact on other aquatic life or wildlife, TPWD's "Kills and Spills" team responds to incidents where fish or other wildlife have been harmed and refers natural resources impacts to TCEQ.[189] TPWD can sue for injunctive relief to stop the facility from releasing any more of the algae, for civil penalties, or both.[190] TPWD can recover damages for any release into or adjacent to state water that affects aquatic life or wildlife—including the value of each fish, shellfish, reptile, amphibian, bird, or animal killed or injured—or that injures the food sources for such life.[191] The money can be used to aid the injured resources.[192] Of course, none of this prevents injuries that have already occurred, but it can prevent further environmental impacts and help fund remediation efforts.

B. Policy Solutions

Some environmental groups would like a moratorium on the commercial use of synthetic organisms and a permanent ban on their use in open-air facilities, including their use in biofuels.[193] Others have called for a new regulatory agency to oversee

185 *Emergency Preparedness and Response: Plant Health Response*, Animal & Plant Health Inspection Service, http://www.aphis.usda.gov/emergency_response/plants.shtml (last modified Dec. 9, 2009).

186 *Plant Health: Pest Detection*, Animal & Plant Health Inspection Service, http://www.aphis.usda.gov/ plant_health/plant_pest_info/pest_detection/index.shtml (last modified July 6, 2011).

187 *Emergency Preparedness and Response: Plant Health Response*, *supra* note 185.

188 *Harmful Algae Blooms: Frequently Asked Questions*, *supra* note 181.

189 *Id.*

190 Tex. Water Code § 7.109(a) (West 2011).

191 *Id.* §§ 12.303, 7.109(a)-(b).

192 *Id.* § 7.109(b).

193 *See, e.g.*, Letter from African Biodiversity Network et al., Civil Society, Center for Genetics & Society, to Dr. Amy Gutman, Chair, Presidential Commission on Synthetic Biology (Dec. 16, 2010), (*available at* http://www.geneticsandsociety.org/ article.php?id=5517). United Nations' Convention on Biological Diversity has called for a *de facto* moratorium on the use of "suicide genes." *Id. Biofuels: Cultivating Energy, Not Invasive Species*, *supra* note 173, at 4 (recommending biofuel crop propagation in containable systems).

biofuels and all their multifarious particulars.[194] Such extreme responses are neither needed nor would they necessarily resolve concerns surrounding algal biofuel. Rather than take these drastic measures, federal and state governments should consider a number of more measured solutions.

As previously discussed, algal biofuel production facilities face permitting at several levels. They have to gain EPA and USDA approval for the organism they are using to produce fuel, and they likely require a state permit for their water use.[195] Federal and/or state governments could establish specific guidelines for gaining approval. At the federal level, EPA or APHIS could require GMOs to incorporate so-called "suicide genes" that would keep algae from surviving outside of the environment for which they were designed. For instance, algae could be designed without flagella for swimming, with an intolerance of variable temperatures, with an inability to absorb low-level carbon dioxide such as from seawater, or with other enfeebling traits. Some companies are already doing this. The chief scientific officer of TransAlgae Limited has said that its idea is to suppress genes not needed for alga cultivation but that would be vital for the algae to survive outside of their regulated environment.[196] Of course, requiring GMO algae to have suicide genes does not address escape concerns with respect to non-GMO algae strains, but many experts suggest that the algae species being used are so specific to their artificial cultivation conditions that this is the *de facto* situation anyway—they cannot survive outside the facilities.[197]

State regulation may have a broader influence. TBPC or TBRC could establish best practices for algae cultivation, and TCEQ could require facilities to follow them to obtain and retain their permits. Similar stipulations are already built into the statutory criteria for aquaculture facilities' exotic species permit. For example, the facilities must have at least three permanent screens between where the exotic species will be in the water and the point where effluent leaves the facility.[198] TBPC or TBRC could consider conditions such as prohibition of open systems or compulsory sterilization of water leaving the facility, although this option is both costly and energy-intensive. The state regulation path would also likely require legislative authorization.

Another way to address concerns about algae escaping would be for appropriate governmental groups at the federal and state levels to develop mitigation plans and protocols specifically for biofuel crops. Plans might address any of the following: which geographical features best naturally prevent species spread and ways to encourage facility construction in those zones; how to deal with cleaning equipment at facilities; early detection of releases, rapid response, long-term response; and how to quarantine areas in case of accidental release. The planning group would be well-advised to build cooperative networks between the private sector and regulators, federal and state agencies, and other stakeholders. In Texas, TBPC or TBRC would probably be good candidates to do this, or possibly TPWD. At the federal level, APHIS's Plant Protection and Quarantine program might be a suitable participant.

194 *Synthetic Solutions to the Climate Crisis*, *supra* note 168, at 35.

195 *See* discussion *supra* Part III.

196 Maron, *supra* note 26.

197 *See id.*

198 31 TEX. ADMIN. CODE § 57.129(b) (2011) (Tex. Parks & Wild. Dep't, Exotic Species Permit: Private Facility Criteria).

A further means of addressing concerns at the federal level would be to shift the burden of proof for TSCA approval and APHIS plant pest analysis to the applicant. Groups wishing to use a given algae strain would have to show that their organism is safe and poses no risk to the environment or public health and no risk of becoming a plant pest. This would almost certainly result in fewer algae being approved for use, with the riskier ones being excluded. Also, the current system yields a disincentive to applicants to develop and provide information about their strain since the default situation is that organisms are approved: the more information the regulatory agency has, the more likely it will prohibit use of the organism. Changing the burden of proof to the applicant could result in more information disclosure, in furtherance of proving an organism's safety.

By far the most effective policy solutions would be state or federal statutes establishing strict liability, insurance requirements, and/or requirements of proof of financial responsibility for operators of biofuel production facilities. While the risk of algal release is low, the potential for negative environmental and economic impacts that would be difficult or impossible to reverse is enormous. In this regard, algal escape resembles three other types of low-risk, high-damage events that are currently addressed by some combination of a liability scheme and an insurance requirement. First, the potential for harm due to the release of radiation from nuclear power plants is addressed by the Price-Anderson Act, which dictates limited strict liability and insurance requirements.[199] Second, hazardous waste generation and disposal are addressed by the Resource Conservation and Recovery Act, which requires companies that deal with such waste to purchase insurance or otherwise provide financial guarantees to cover future corrective action in case something goes wrong.[200] The Comprehensive Environmental Response, Compensation, and Liability Act, commonly termed Superfund, further stipulates unlimited, strict, joint, and several liability for all parties related to a facility requiring hazardous waste cleanup.[201] Lastly, the Oil Pollution Act of 1990 (OPA) establishes strict, limited liability for damage due to oil spills from tanker ships and requires them to meet minimum financial responsibility obligations.[202]

The strongest reason for liability mandates in all three cases is deterrence. If companies are sufficiently deterred from allowing algae to escape the confines of their facilities, they will use the utmost ingenuity and creativity to prevent escape. This can be far more effective than governmental use of command-and-control measures. In the case of OPA, such liability provisions seem to have had a positive effect on oil transportation safety, as indicated by a decline in frequency and severity of spills from OPA's passage (until the British Petroleum oil spill in 2010).[203]

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199 42 U.S.C. § 2210 (2010); *See* Lamb v. Martin Marietta Energy Sys., 485 F.Supp. 959, 662 (W.D. Ky. 1993).

200 Resource Conservation & Recovery Act, 42 U.S.C. § 6924(t).

201 Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9607(a).

202 33 U.S.C. § 2706, 2716.

203 Jeffrey Morgan, *The Oil Pollution Act of 1990: A Look at its Impacts on the Oil Industry*, 6 FORDHAM ENVTL. L.J. 1, 7-12 (1994); *see generally* Inko Kim, *Ten Years After the Enactment of the Oil Pollution Act of 1990: A Success or Failure*, 26 MARINE POL. 197 (2002) (analyzing damages from oil spills and assessing why and how they occur.)

The other half of the policy solution in all three cases is the requirement of either insurance or some other proof of financial responsibility. This has two possible beneficial effects. First, insurers act as private regulators, with regular facility inspections and other measures that government is ill-equipped to provide, and insurance premium structures provide further incentive for risk reduction. Second, in the worst-case scenario, if algae escape and cause environmental damage, financial resources are available to cover remediation costs. These remedies are still *ex post facto*, not preventative. There are other downsides to requiring insurance or other proof of financial responsibility, too: such a policy could prevent companies from investing in algal biofuels, and periodic unavailability of insurance could force industry shut downs, which is an ongoing concern in the hazardous waste industry.[204]

Strict liability and insurance requirements do not confront the issue of proving where algae that show up in the wild originated, either. However, in many cases the proprietary identifications of strains could make them traceable to a single company. With these solutions, federal and state government should be able to address most concerns regarding algal biofuels.

VI. CONCLUSIONS AND RECOMMENDATIONS

Algal biofuel is quickly becoming a reality, and the industry is taking root in Texas. Companies are using a broad array of algae, technologies, and practices to produce a range of fuel products that offer substantial environmental improvements over their predecessors. Although there are risks to bringing GMO and/or non-localized algae species into the state, concerns should be mitigated by the many stages at which government can step in to regulate: prior to production, during production, and in the event something goes wrong. In reality, the risks are few and the rewards great. The real roadblocks are purely economic, since algae still cannot compete with oil until the price of a barrel reaches $100.

In the interests of being as safe as possible some steps should be taken towards further preventing that minute chance of disaster. Planning groups at the state and possibly also federal levels need to do contingency planning for how to deal with an accidental algae escape that threatens environmental consequences. Strict liability should be statutorily established, whether nationwide or statewide. TCEQ and TPWD should require insurance for operators of algal biofuel facilities; and above all, these facilities should be closely monitored. With these safeguards, Texas can charge into the future of energy with confidence and security.

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204 Eric Biber, *supra* note 184, at 424.

working as legislative aide to Texas State Representative Ryan Guillen. Between earning law degrees, she taught English and practiced law in South Korea and Germany. She hopes to have a positive effect on the future of Texas' environment.

Overcoming the "Energy Paradox" in the Built Environment

by George M. Padis

I. Introduction

With global warming as a looming threat[1] and energy dependence on fossil fuels from unstable governments undermining national security,[2] reducing dependence on

1 *See, e.g.*, Cynthia Rosenzweig et al., *Assessment of Observed Changes and Responses in Natural and Managed Systems*, *in* Intergovermental Panel on Climate Change, Climate Change 2007: Impacts, Adaptation, and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the IPCC 79, 81 (M.L Parry et al. eds., 2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter1.pdf ("Physical and biological systems on all continents and in most oceans are already being affected by recent climate changes, particularly regional temperature increases (very high confidence).").

2 *See, e.g.*, Mark E. Rosen, *Energy Independence and Climate Change: The Economic and National Security Consequences of Failing to Act*, 44 U. Rich. L. Rev. 977, 978 (2010) ("U.S. military presence in the Persian Gulf is necessary to ensure the unimpeded flow of oil because 'America's thirst for oil leaves little choice.'" (quoting CNA Corp., Powering America's Defense: energy

fossil fuels and the production of Green House Gases (GHGs) is an imperative.[3] Of the contributors to GHGs, the energy used to maintain the climate of our buildings represents approximately 43% of total U.S. CO_2 production.[4] Further, existing building technologies alone could cut 30%–40% of emissions in new buildings.[5] Also, aging construction produces a disproportionate amount of GHGs.[6] Therefore, the green building movement not only diminishes GHGs when compared to other new construction projects, but also, by increasing the housing supply, drives down costs of housing at large—speeding up the obsolescence process of existing old and inefficient construction.[7] Therefore, green building[8] has tremendous potential for targeting and reducing GHG emissions. There are, however, unique and significant hurdles to the rapid implementation and proliferation of green buildings, and the adoption of green building techniques by private developers (the focus of this note) has lagged behind what cost–benefit analysis predicts.[9] This phenomenon is not unique to green building and is seemingly endemic to the adoption of energy-efficient technologies—the so-called "energy paradox."[10]

AND THE RISKS TO NATIONAL SECURITY 7 (2009), *available at* http://www.cna.org/sites/default/files/Powering%20Americas%20Defense.pdf)).

3 *See, e.g, id.* (discussing "the serious environmental and national security 'externalities' that directly result from current consumptive trends.").

4 MARILYN A. BROWN ET AL., TOWARDS A CLIMATE-FRIENDLY BUILT ENVIRONMENT, at iii (June 2005), *available at* http://www.pewclimate.org/docUploads/Buildings_FINAL.pdf (Solutions White Paper Series prepared for the Pew Center for Global Climate Change, June 2005).

5 *Id.* at v.

6 *See* Agis M. Papadopolous et al., *Feasibility of Energy Saving Renovation Measures in Urban Buildings: The Impact of Energy Prices and the Acceptable Pay Back Time Criterion*, 34 ENERGY & BUILDINGS 455, 457 fig.3 (2002).

7 As prices for housing fall with increased supply, the value of the land begins to usurp the value of the building—especially inefficient buildings with high heating and cooling costs. As consumers have access to newer, more efficient housing, due to increased supply and competition, such properties become prime targets for redevelopment if housing demand continues to increase—with, for example, population growth. Therefore, the availability of new development (overall) accelerates the obsolescence of the housing stock, decreasing GHG emissions.

8 "Green building" for the purposes of this note refers to sustainable design features. More specifically, third-party certification is the primary focus of this note, such as LEED certification. *See infra* note 51 (defining and describing LEED certification).

9 John Mooz, Senior Vice President, Hines, Real Estate Sustainability Panel at The University of Texas: Does "Green" Pay? (Nov. 9, 2010) (on file with author) (describing how government was an early adopter of green building followed by commercial real estate, which has lagged behind); Leanne Tobias, *Background Paper 2b– Toward Sustainable Financing & Strong Markets for Green Building: U.S. Green Building Finance Review*, COMM'N FOR ENVT'L COOP., 9-10 (Mar. 13, 2008), http://www.cec.org/Storage/61/5365_GBPaper2b_en.pdf (observing that green development represents only 2% of non-residential building construction). Notably, Hines is the leading developer and owner of green office buildings in the U.S. Norm Miller et al., *Does Green Pay Off?*, 14 J. REAL EST. PORTFOLIO MGMT. 385, 393–94 ex.12 & 13 (2008).

10 *See generally, e.g.*, Kenneth Gillingham et al., *Energy Efficiency Economics and Policy*, RES. FOR THE FUTURE (Apr. 2009), http://www.rff.org/rff/documents/rff-dp-09-13.pdf (discussing market barriers, market failures, and behavioral failures that hinder the adoption of energy efficient technologies); Stephen J. DeCanio, *The Efficiency Paradox: Bureaucratic and Organizational Bar-*

This note argues three main points to address the energy paradox in the built environment: (1) green building policies should focus on large developers in urban areas to avoid the fragmentation problem inherent to the building industry, (2) the principal–agent theory for green development is incomplete, and (3) an information breakdown occurs with developers, owners, and capital partners who tend to overestimate the cost and underestimate the benefit of green building. To analyze these issues, I distributed a questionnaire to executives at local Austin development firms and capital groups who are members of the Urban Land Institute[11] to determine the obstacles and possible solutions to green building. I also conducted interviews through email correspondence with these individuals, attended a panel discussion "Does 'Green' Pay?" at the University of Texas on November 9, 2010, and interviewed the panelists. The results of these questionnaires and interviews greatly informed the arguments and analysis provided in this note, although the sample size was not large enough to provide statistically significant data. This note, while primarily based on the synthesis and critique of existing scholarship, incorporates this empirical research throughout.

Section II provides background, briefly discussing the unique benefits of green building. Section III discusses the obstacles to green building and analyzes some of the prevailing theories. Incorporating additional empirical research, interviews, and insights from behavioral economics, Section IV synthesizes the prevailing views and offers a new perspective. Because of the difficulties that arise from information asymmetries, market failures, and behavioral economics, the development of green building has not been as robust as expected.[12] In light of these inefficiencies and the positive externalities of green development, Section V argues for temporary government support and specific legal strategies to address these issues.

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riers to Profitable Energy-Saving Investments, 26 ENERGY POL'Y 441 (1998) (describing the paradox about why profitable energy-efficient investments are nonetheless not made by firms); Lukas Weber, *Some Reflections on Barriers to the Efficient Use of Energy*, 25 ENERGY POL'Y 833 (1997) (arguing that the 'energy paradox' should be approached by identifying and overcoming market-related barriers); Kostas Kounetas & Kostas Tsekouras, *The Energy Efficiency Paradox Revisited Through a Partial Observability Approach*, 30 ENERGY ECON. 2517 (2008) (examining the energy efficiency paradox as it relates to Greek manufacturing firms); Clinton J. Andrews & Uta Krogmann, *Explaining the Adoption of Energy-Efficient Technologies in U.S. Commercial Buildings*, 41 ENERGY & BUILDINGS 287 (2009) (investigating factors explaining the adoption—or lack thereof—of energy-efficient technologies in U.S. commercial buildings).

11 The Urban Land Institute (ULI) is a

> multidisciplinary real estate forum . . . [for] an open exchange of ideas, information, and experience among local, national, and international industry leaders and policy makers dedicated to creating better places . . . . ULI provides information they can trust and is a place where leaders come to grow professionally and personally through sharing, mentoring, and problem solving. With pride, ULI members commit to the best in land use policy and practice.

Learn About ULI, URBAN LAND INST., http://www.uli.org/LearnAboutULI.aspx (last visited Apr. 15, 2011).

12 *See* Tobias, *supra* note 9.

II. BACKGROUND—THE UNIQUE BENEFITS OF GREEN BUILDING

Many of the benefits of green technology generally and green building in particular are externalities in that the benefits are not fully enjoyed by individual producers. The benefits produced—e.g. lower energy prices,[13] increased national security,[14] and a slower rate of global warming—will be enjoyed by those who consume fossil fuels, live in a free society, and enjoy the shoreline just the same as those who drive plug-in hybrids, fight wars abroad, and do oceanographic research on the effects of climate change. For example, a consumer of fossil fuels would be inordinately (and ironically) benefitted by lower energy prices more than someone who consumes less of these fuels.[15] Therefore, a significant portion of the benefits derived from green technologies that lower GHGs are externalities. Further, there are several other external benefits that society at large appreciates as a result of green technologies: growth in informa-

13 By reducing energy demand, prices for fuels will (presumably) fall, assuming that supply remains constant. This, however, is undermined by the fact that as prices fall, exploration for new sources becomes less feasible—reducing supply. Further, as the price falls, fluid demand abroad (particularly in developing nations) is likely to increase. It seems reasonable, nonetheless, to suppose that if American demand fell off, energy prices—at least here—would likely fall until a new equilibrium is reached.

14 Rosen, *supra* note 2, at 987 (arguing that the link between American national security and access to foreign oil became explicit when the Carter Administration expressed its "willingness to use military force to protect the world's access to oil in order to protect the global market.").

15 Assume that actor X regularly consumes 10 gallons of gasoline per week and actor Y consumes only 2 gallons. If due to the effect on demand of the reduced consumption of Y and the rest of society, the gas price falls from four dollars to 2 dollars, and both actors' consumption remain constant, then X saves $20, whereas Y saves only $4. Therefore, since X, through her high consumption, did not contribute to the diminished price, but she appreciated a savings of $20, she is a free rider with respect to that savings.

tion jobs such as research and development,[16] increases in intellectual property wealth through the proliferation of patents,[17] and enhanced productivity and quality of life.[18]

Green building drives demand for green technology.[19] Demand for green technology drives job growth in research and development.[20] Research and development jobs are (generally) not the type of job that is capable of being outsourced, because they require skill and expertise, and the population of the United States has a relative wealth of education and skill.[21] Therefore, as compared with (for example) manufacturing jobs, green building increases demand for employment that may be primarily local.[22]

16 *Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World*, United Nations Environment Programme 3–4 (Sept. 2008) [hereinafter *Green Jobs*], http://www.unep.org/ labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf (proposing that, as a sustainable economy develops, there will be an increase in green research and development jobs); Robert Pollin et al., *Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy*, Pol. Econ. Res. Inst. 2, 9–12 (Sept. 2008), http://www.peri.umass.edu/fileadmin/pdf/other_publication_types/peri_report.pdf ("Investments in [green technology] will produce employment opportunities across a broad range of familiar occupations—roofers, welders, electricians, truck drivers, accountants, and research scientists . . . . We estimate [that green investment could create] about 935,000 million direct jobs, 586,000 indirect jobs, and 496,000 induced jobs, for a total of about 2 million total jobs created."); *see also* Adam B. Jaffe, *Characterizing the "Technological Position" of Firms, with Application to Quantifying Technological Opportunity and Research Spillovers*, 18 Res. Pol'y 87 (1989) (describing the spillover effect of R&D development into other, "neighbor" fields, which suggests that subsidies for green development could have a positive "spillover" effect on the economy generally).

17 Nick Johnstone et al., *Renewable Energy Policies and Technological Innovation: Evidence Based on Patent Counts*, 45 Envtl. & Res. Econ. 133, 151 (2010) (observing that "empirical results [from patent filings] indicate that public policy has had a very significant influence on the development of new technologies in the area of renewable energy.").

18 *See* Greg Kats et al., The Costs and Financial Benefits of Green Buildings 55–56 (Oct. 2003) (A Report to California's Sustainable Building Task Force), *available at* http://www.calrecycle.ca.gov/greenbuilding/design/costbenefit/report.pdf (noting that the link between health, productivity, and green building techniques is difficult to determine but observing that there are "potential benefits of up to $250 billion per year from improved indoor air quality."); Margalit Younger et al., *The Built Environment, Climate Change, and Health: Opportunities for Co-Benefits*, 35 Am. J. Preventative Med. 517, 520 (2008) ("Decisions to use sustainable building materials and operation practices can promote health . . . .").

19 *See, e.g.*, *Green Jobs*, *supra* note 16; Jaffe, *supra* note 16.

20 *Green Jobs*, *supra* note 16.

21 The Nat'l Ctr. for Pub. Pol. and Higher Educ., Measuring Up 2008: The National Report Card on Higher Education 6 (2008), *available at* http://measuringup2008.highereducation.org/print/NCPPHEMUNationalRpt.pdf (placing the United States second among percentage of college degrees among adults 35–65 and tied for ninth among percentage of college degrees among adults 25–34); Mark Doms et al., *Local Labor Force Education, New Business Characteristics, and Firm Performance*, 67 J. Urban Econ. 61, 69 fig.4 (2010) (demonstrating Austin's high level of college-educated adults correlated with new business starts).

22 Although admittedly, green technology development jobs are capable of being outsourced to other countries, they are not as susceptible as manufacturing jobs (relatively), which require less expertise and skill. Further, it is very hard to say how many green building jobs are created because they may simply replace normal construction jobs.

Green technology demand also drives increased intellectual property in the form of patents.[23] For example, mandatory green energy policies seem to cause a significant increase in the proliferation of green technology patents.[24] As green technology is developed, patents are developed to monetize this technology. Such intellectual property is wealth creation in its purest form—an idea becomes property and is monetized, deriving value where there was none before.[25] While some may argue that the wealth protected by intellectual property impoverishes the public domain and extracts rents from the public[26]—particularly having a distributional effect (more pronounced in the international setting)—this debate continues to rage among scholars, with little practical effect on policy and little conclusive evidence either way.[27] Further, as (arguably) the United States offers very robust protections of intellectual property,[28] these technologies have a competitive advantage, favoring their development domestically in the U.S.[29]

Further, because green building requires innovation, research, and development, there are significant positive externalities associated with adoption and spillovers.[30] An adoption externality occurs where the adopter of an energy-efficient technology increases efficiency by gaining experience and expertise—learning by doing.[31] Spillovers occur where a market participant selects to use a new technology not based on their own research but rather from hearing about it or noticing another participant using or implementing the technology.[32] Therefore, the second adopter "free rides" on the

23 Johnstone, *supra* note 17.

24 *See id.* at 149 ("The failure of voluntary programs to induce innovation suggests that binding policy commitments are needed to foster technological change.").

25 *See* Peter M. Gerhart, *Tragedy of TRIPS*, 2007 MICH. ST. L. REV. 143, 168 (2007) (arguing that negotiations over intellectual property is a negotiation for wealth).

26 *Id.* at 169 ("In intellectual property negotiations . . . an increase in one nation's wealth from knowledge goods is a decrease in another nation's wealth . . . . because once the knowledge is produced and encapsulated as property, it must be rationed through the market . . . . [which] makes the decision to create property a zero sum game. Producers of knowledge goods win, while consumers of knowledge goods lose.").

27 *But see id.* at 183 (noting that, although TRIPS had a distributive impact by protecting American traditional intellectual property rights, AIDS activists had an impact within the U.S., influencing a relaxation of patent rights for the TRIPS provisions relevant to AIDS medicine). For a useful overview of this debate, *see generally* David G. Ockwell et al., *Intellectual Property Rights and Low Carbon Technology Transfer: Conflicting Discourses of Diffusion and Development*, 20 GLOBAL ENVTL. CHANGE 729 (2010).

28 Chidi Oguamanam, *Beyond Theories: Intellectual Property Dynamics in the Global Knowledge Economy*, 9 WAKE FOREST INTELL. PROP. L.J. 104, 119 (2009) (comparing the exclusion regimes in the West to the Arab world and China).

29 Timothy B. Folta, *Geographic Cluster Size and Firm Performance*, 21 J. BUS. VENTURING 217, 219 (2006) (observing and attempting to explain the phenomenon of "new, technically oriented firms . . . . [that] are located in clusters of similar firms [in areas] such as Silicon Valley, Seattle, Boston, Austin, and San Diego in the United States.").

30 *See, e.g.*, Gillingham, *supra* note 10, at 13 (describing positive externalities associated with energy-efficient technologies).

31 *Id.*

32 *Id.*

research and investigation of the initial adopter. Because of the serendipitous nature of innovation, additional spillovers include unintended discoveries that benefit the community although they are not captured by the first adopter.[33]

Further, some studies suggest that occupants of green buildings experience higher quality of life and increased productivity.[34] Because green building techniques maximize the amount of natural lighting and minimize volatile organic compounds (VOCs),[35] occupants report that their quality of life improves, their health improves, and, in office buildings, their productivity thereby increases.[36] Some tenants have reported reduced amounts of absenteeism.[37] A recent study—*Green Buildings and Productivity*—attempts to quantify this decrease in worker sick days and thereby quantify the increased value to the tenant.[38] This study concludes that green buildings account for 2.88 average fewer sick days per year, which across 250 work days and an average salary of $106,644 accounts for $1,228.54 in added value per worker.[39] Further, occupants may derive a psychological benefit from the knowledge that their building does not contribute to GHG emissions.[40] Therefore, a green building improves the quality of life and productivity of its occupants.

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33 *See, e.g.*, Mooz, *supra* note 9 ("A group of [Hines] engineers discovered that the average building transformer is 85% efficient—in that, 15% of the energy was lost. Computer rooms used harmonic utilization transformers (which, because they are a little more expensive, are used almost exclusively in computer rooms) which [achieve] 95% efficiency. The payback on installing those transformers [the cost difference between standard transformers and the more efficient transformers] was within six months."). This is an excellent example of the serendipitous nature of innovation and of how spillovers occur; in this case, a technology developed for computer rooms has an unexpected application in commercial buildings. Although Hines did not develop the technology, it captures the benefit.

34 KATS, *supra* note 18; Younger, *supra* note 18.

35 Jeong Tai Kim & Gon Kim, *Overview and New Developments in Optical Daylighting Systems for Building a Healthy Indoor Environment*, 45 BUILDING & ENV'T 256 (2010) (describing the new uses and types of daylighting techniques); Sumin Kim, *The Reduction of Formaldehyde and VOCs Emission from Wood-Based Flooring by Green Adhesive Using Cashew Nut Shell Liquid (CNSL)*, 182 J. HAZARDOUS MATERIALS 919 (2010) (describing the dangers of formaldehyde and VOCs from flooring veneer and how it is avoided by the green building policies in the U.S.).

36 KATS, *supra* note 18.

37 Mooz, *supra* note 8 ("We built a building in Washington DC, and the tenant reported a 90% decrease in absenteeism. . . . How do you measure that? How do you prove it is the building?"); *see also* Betsey del Monte, Principal & Dir. of Sustainability, Beck Architecture, Real Estate Sustainability Panel at The University of Texas, Does "Green" Pay? (Nov. 9, 2010) (on file with author) ("How do you prove it was the building and not some change in the tenant corporation's policy or management?").

38 Norm G. Miller, et al., *Green Buildings and Productivity*, 1 J. SUSTAINABLE REAL EST. 65 (2009), *available at* http://www.costar.com/josre/JournalPdfs/04-Green-Buildings-Productivity.pdf (discussing and attempting to quantify the productivity benefits of green building).

39 *Id.* at 87.

40 *See* Lyn S. Amine, *An Integrated Micro- and Macrolevel Discussion of Global Green Issues: "It Isn't Easy Being Green,"* 9 J. INT'L MGMT. 373, 385–90 (2003) (arguing that marketers should focus on human needs of self-esteem and belonging in promoting green policies). *But see* Lorraine Whitmarsh et al., *Public Engagement with Carbon and Climate Change: To What Extent is the Public 'Carbon Capable'?*, 20 GLOBAL ENVTL. CHANGE 56, 57 (2010) ("Although there is widespread

Because of its significant benefits, policies should be implemented to encourage green building. Green building, as an aspect of the overall green technology movement, enjoys broad political support.[41] However, without an intelligent approach to policies, there are risks of waste, and in some cases counterproductivity.[42] Therefore, policies should be specifically tailored to address the obstacles of green building to maximize efficiency.

III. OBSTACLES AND THE PREVAILING THEORIES—ANALYSIS AND CRITIQUE

Scholars have noted many unique and challenging obstacles to green building. For instance, (as discussed previously) the true benefits are not fully appreciated by the decision maker.[43] As an initial matter, green building is indeed more expensive.[44] Additionally, the principal–agent problems associated with landlord–tenant relationships are manifest in green building.[45] Also, it remains unclear whether consumers fully appreciate the internal costs saved—energy costs, quality of life, and productivity—let alone make purchasing decisions based on these benefits.[46] Also, unlike electricity

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global recognition of climate change, there is a general lack of knowledge and emotional engagement with the issue. Surveys show that awareness and concern about climate change have increased over the past two decades, but in the context of other, more immediate or tangible concerns (e.g., health, finances), climate change takes a low priority." (citations omitted)).

41 *See, e.g.*, Bryan Walsh, *What Is a Green Collar Job Exactly?*, TIME, May 26, 2008, http://www.time.com/time/health/article/0,8599,1809506,00.html ("What do presidential candidates John McCain, Barack Obama and Hillary Clinton have in common — aside from the obvious? They all love green-collar jobs.").

42 *See, e.g.*, Margaret Taylor, *Beyond Technology-Push and Demand Pull: Lessons from California's Solar Policy*, 30 ENERGY ECON. 2829, 2841 (2008) (noting that California's solar rebate program may have capped costs or, at worst, caused price inflation).

43 For example, an owner of a building would not experience the savings in electricity that would be enjoyed by a tenant, although she would incur the initial expense, to be discussed more at length *infra*.

44 Lisa Fay Matthiesson & Peter Morris, *Costing Green: A Comprehensive Database and Costing Methodology*, DAVIS LANGDON 16 (July 2004), https://www.usgbc.org/Docs/Resources/ Cost_of_Green_Full.pdf (concluding that there is between a 10.3% (platinum)–1% (silver) cost premium for LEED certification depending on the climate).

45 Adam B. Jaffe & Robert N. Stavins, *The Energy Paradox and the Diffusion of Conservation Technology*, 16 RESOURCE & ENERGY ECON. 91, 98 (1994).

46 *See* e-mail from Warren Walters, Chief Fin. Officer, Simmons Vedder Partners, to author (Oct. 26, 2010, 18:43 CST) (on file with author) ("It is not always clear that tenants are willing to pay for the higher upfront construction costs that sustainable projects incur. In the office sector in particular, Austin's tenant base seems less willing to monetize their commitment to sustainable projects than a market like Houston."); e-mail from Kevin Black, Principal, T. Stacy & Associates, Inc., to author (Oct. 28, 2010, 15:27 CST) (on file with author) ("The biggest impediment [to green development] still is the cost–benefit analysis. . . . [A]s a developer you still aren't getting paid enough either in lease rate or sales price to entice you to develop very far down the green spectrum."). *But see* Leigh Kellett Fletcher, *Green Construction Costs and Benefits: Is National Regulation Warranted?*, 24 NAT. RESOURCES & ENV'T 18, 19 (2009) ("The results indicated that during the years 2004-07, ENERGY STAR buildings in

production, the stakeholders are myriad and diverse: insurers, financial institutions, builders, consumers, electricity producers themselves, contractors, subcontractors, local governments, the Federal Government—the list is nearly endless.[47] Therefore, the building industry is highly fragmented.[48] This Section will address these obstacles and the prevailing views, offering analysis and critique along the way.

A. The Cost Premium

Green building is more expensive than conventional building techniques. Some evidence indicates that the cost differences may be insubstantial or as low as 1%.[49] Other studies indicate that the additional cost is a minimum of 1%–2%, and perhaps closer to 3%–6%.[50] Also, costs vary depending on the type of building you are dealing with. If, for example, the building quality was very high to begin with and the building would have been very efficient, the cost premium of LEED[51] certification would be relatively low.[52] However, if the building would have been very *in*efficient, then the cost premium

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the CoStar database had higher occupancy rates, higher direct rental rates, higher sales price per square foot, and, after 2005, lower cap rates than non-ENERGY STAR buildings," suggesting that the perceptions of these practitioners is not the reality—a theme that permeates the research to be discussed at length *infra*).

47 Brown, *supra* note 4, at 17–19.

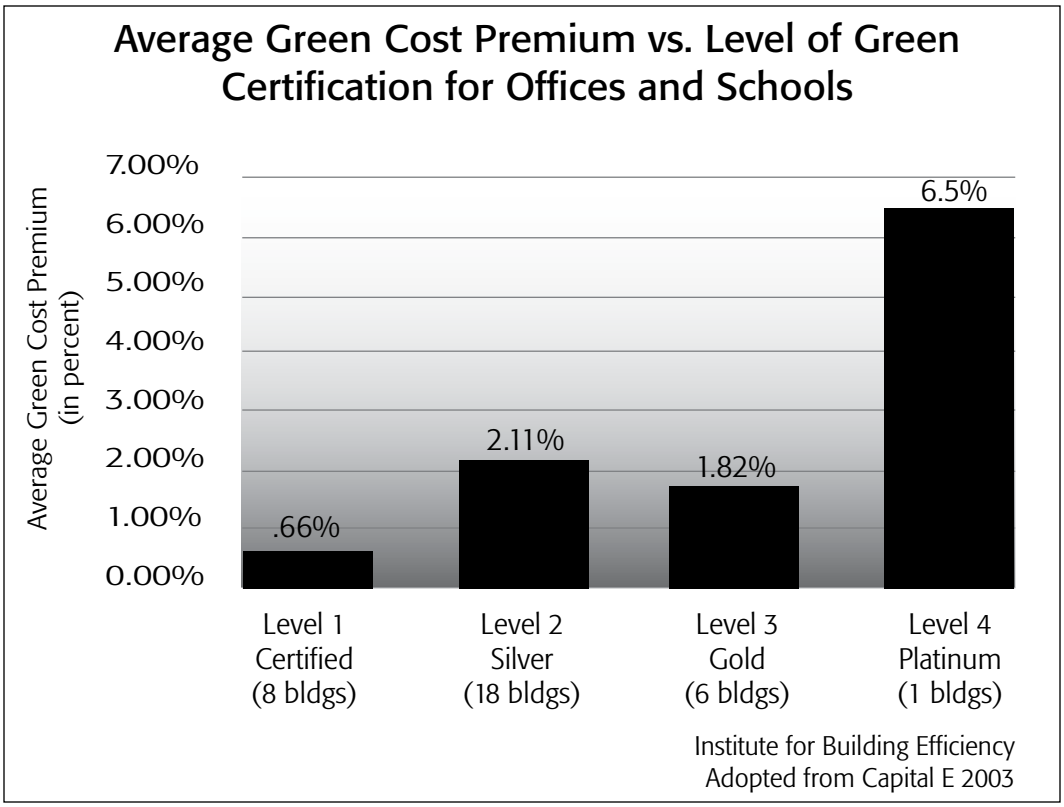
48 *Id.*; Scott Hassell et al., Rand Sci. & Tech. Policy Inst., Building Better Homes 46 (2003) (prepared for HUD and the Partnership for Advancing Technology in Housing (PATH), *available at* http://www.rand.org/pubs/monograph_reports/2005/MR1658.pdf (describing the geographic, horizontal, and vertical fragmentation in the building industry).

49 *Compare* Matthiesson & Morris, *supra* note 44, at 19 (averaging LEED academic buildings and comparing them to non-LEED buildings revealed no significant difference in cost), *with* Sam Kubba, Green Construction Project Management and Cost Oversight 309 fig.8.1 (2005) (estimating the cost premium at as high as 6.5% for platinum). Walters, *supra* note 46, and e-mail from Kevin Black, Principal, T. Stacy & Assocs., Inc., to author (Nov. 1, 2010, 09:23 CST) (on file with author) (estimating the cost premium for LEED silver at greater than 10% but noting that the "cost is dropping by the day"). *See also* Vance Voss, Managing Dir. & Portfolio Manager, Principal Real Estate Investors, Real Estate Sustainability Panel at The University of Texas, Does "Green" Pay? (Nov. 9, 2010) (describing a building a project where his investment group came in as an equity partner. In Phase I, they decided late in the design process to go for LEED Gold, and the increased costs were 3%–4%. In Phase II, it was decided to be LEED Gold from the beginning, and the additional cost was only .5%). This is a good example of how adoption (learn-by-doing) externalities can create efficiencies as well.

50 Fletcher, *supra* note 46, at 19–20. For a good survey of the various studies evaluating the green-construction-cost premium, *see* M.H. Issa et al., *Canadian Practitioners' Perception of Research Work Investigating the Cost Premiums, Long-term Costs and Health and Productivity Benefits of Green Buildings*, 45 Buildings & Env't 1698, 1700 (2010).

51 LEED stands for Leadership in Energy and Environmental Design, a building certification program promulgated by the U.S. Green Building Council, which certifies new buildings as LEED certified, silver, gold, and platinum depending on the environmental features. U.S. Green Bldg. Council, LEED 2009 for New Construction and Major Renovations vii (2009), *available at* http://www.usgbc.org/ShowFile.aspx?DocumentID=5546.

52 Gregory P. Fuller, Chief Operating Officer, Granite Props., Real Estate Sustainability Panel at The University of Texas, Does "Green" Pay? (Nov. 9, 2010) (arguing that the cost premium depends on the building: "not all buildings are equal").



could rise much higher.[53] Within these costs, there are significant "soft" costs associated with the documentation process required to achieve LEED certification, for example.[54] Considering the cost premium, some developers remain unconvinced that green building makes financial sense.[55] In the responses from the surveys distributed to developers, cost was the number one cited obstacle to green building.[56] See the table above for a description of the estimated cost premiums at various levels of green certification.[57]

B. THE PRINCIPAL–AGENT PROBLEM

One problem that many scholars have noted is the principal–agent problem of most commercial buildings.[58] Tenants, for the most part, are short-term occupants (at

53 *Id.*

54 *See, e.g.*, JERRY YUDELSON, MARKETING GREEN BUILDING SERVICES 75–76 (2008) (describing the soft costs associated with green building, including design, modeling, and LEED certification). *But see*, Mooz, *supra* note 9 (noting that his company has experimented with staff gaining LEED certification as accredited professionals (AP) to handle certification internally to reduce the "soft costs").

55 *See, e.g.*, Black, *supra* note 46 ("the biggest impediment . . . is the cost").

56 Emails from survey respondents. Walters, *supra* note 46; Black, *supra* note 46; e-mail from Kyle Brock, Senior Vice President – Finance, Novare Group, to author (Oct. 27, 2010, 10:33 CST) (on file with author).

57 *See* KATS, *supra* note 18, at 15 fig.III-1 (chart extrapolated from table).

58 Jaffe & Stavins, *supra* note 45.

least when compared to the landlord) and are therefore not motivated by the long-term savings of a building. Tenants are usually responsible for utilities.[59] So, the landlord does not care what the utilities are because it does not affect her bottom line.[60] The landlord, however, would have to bear all of the upfront costs of the sustainable resources. Because of this principal–agent problem, green development remains unlikely—or so the argument goes.[61] Empirical evidence supports the notion that developers and practitioners believe that this is a major obstacle to green building.[62]

There are several problems with this argument. First, assuming perfect information, the tenant would internalize the savings of the utilities into his willingness to pay rent. For illustration, assume the rent is $1,000 a month in a sustainable building—building *G*, and $950 a month at an unsustainable building—building *U*. If the utilities saved are greater than $50, then the rational choice for the tenant is building *G*. Assume the utility savings are $100. Then, (excluding other income and expenses), that would warrant a 10% (or less) increase in the construction costs, as the benefit to the tenant is internalized to the rent, and therefore passed on to the landlord.[63]

Another problem with this argument is that the landlord does not have to bear all of the costs upfront. Most buildings are financed over twenty or thirty years.[64] Further, the mortgage payments are paid for (and then some in a successful investment property) by the income stream of the building—which, assuming the tenant internalizes the utility savings into their willingness to pay for rent, means that the tenant *does in fact pay for the costs*. Therefore, the principal–agent explanation is incomplete and can be overcome by effectively signaling savings to the tenants.[65]

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59 *See, e.g.*, Texas Realtors Association, Residential Lease 4 (2005), *available at* http://www.texasrealtors.com/mr/forms/blank/2001%20Final.pdf (last visited Oct. 16, 2011) ("11. UTILITIES: A. Tenant will pay all connection fees, service fees, usage fees, and all other costs and fees for all utilities to the Property (for example, electricity, gas, water, wastewater, garbage, telephone, alarm monitoring systems, cable, and Internet connections) . . . .").

60 *Id.*

61 *See generally* Jaffe & Stavins, *supra* note 45 (describing, among others, the market failure created by the principal–agent relationship of landlords, builders, and tenants—who end up paying for utilities).

62 Issa, *supra* note 50, at 1710 (discussing the responses from practitioners and noting that the most common open-ended response when asked about the obstacles to green development was the different interests of the stakeholders, 32%; one practitioner commented that the primary obstacle was "the very separate interests of the parties over the life of a project.").

63 The evidence suggests that this is the case, particularly with commercial occupants. *See* Piet Eicholtz et al., Doing Well By Doing Good? Green Office Buildings 30 (Center for the Study of Energy Markets (CSEM) Working Paper Series, Working Paper No. 192, 2009), *available at* http://escholarship.org/uc/item/4bf4j0gw;jsessionid=F077E7A36B7E168D22EE945AA8A552F9 ("There is a clear inverse relationship between market value and energy usage—among buildings that have all been certified as energy efficient.").

64 *See, e.g.*, Tobias, *supra* note 9, at 1 (describing the development and purchase of real estate as "capital intensive" requiring the engagement of the finance sector to have effect).

65 Eicholtz, *supra* note 63, at 33–34. *But see* Andrews & Krogmann, *supra* note 10, at 294 ("The renter's split-incentive dilemma is real, because rental buildings are indeed less likely to adopt energy-efficient features in comparison to owner-occupied buildings."). This view can be reconciled, however, because although tenants can be effectively signaled, there is still a

C. It Is Unclear Whether Reduced Energy Savings Are Internalized by Tenants

It is unclear, however, whether consumers of green buildings (tenants) actually appreciate the internal value of lower energy costs, increased productivity, and higher quality of life in making lease decisions. For example, one Austin developer remarked, "It is not always clear that tenants are willing to pay for the higher upfront construction costs that sustainable projects incur. In the office sector in particular, Austin's tenant base seems less willing to monetize their commitment to sustainable projects than a market like Houston."[66] At the Does "Green" Pay? panel on sustainable building at the University of Texas, one panelist observed that, although "it is about making money [by way of] 20–40% reduced utility costs[,] [t]enants aren't believing the story yet and failing to appreciate utility savings."[67] On the other hand, at least some studies support the notion that not only do tenants pay more in their leases, but buyers are willing to pay more for the property (in the form of compressed capitalization rates).[68]

D. Fragmented Building Industry

Perhaps most importantly, the building industry is vertically, horizontally, and geographically fragmented.[69] Fragmentation stifles innovation by raising the transaction costs of educating disparate stakeholders and reducing information spillover and sharing between firms.[70] Fragmentation occurs geographically because differing building

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cost—which could account for the disparity. Further, if the information asymmetry is with the developer or owner, then whether a tenant would internalize rent savings would be irrelevant to the owner or developers decision to incur the capital costs associated with increased efficiencies.

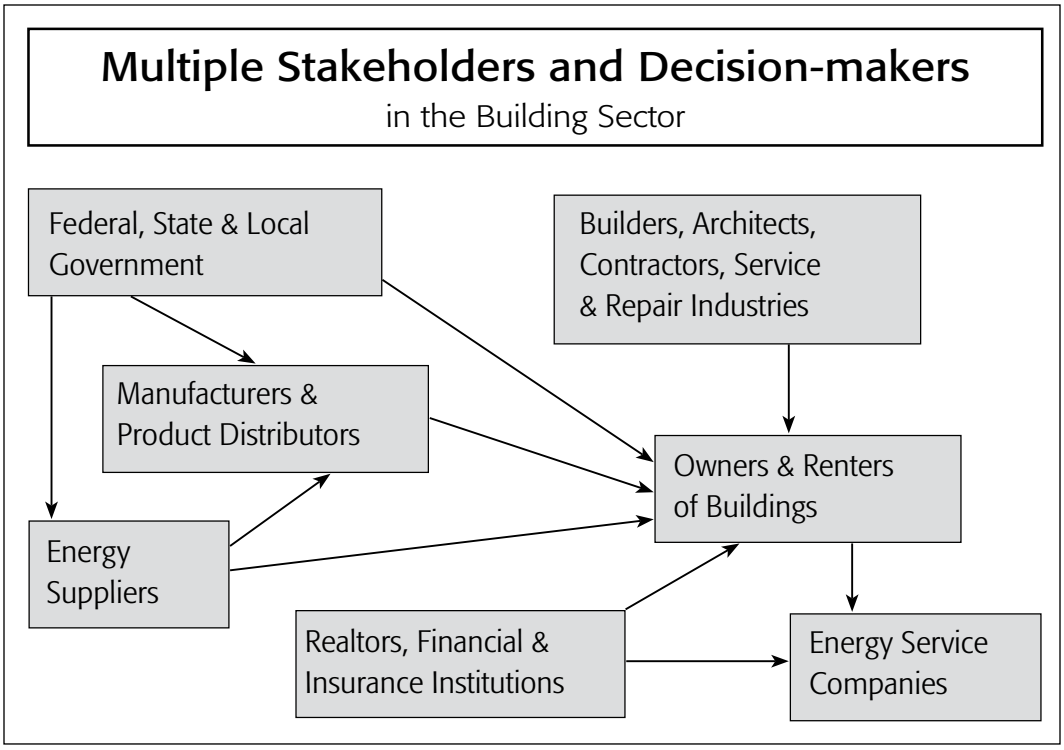
66 Walters, *supra* note 46.

67 Fuller, *supra* note 52.

68 Fletcher, *supra* note 46 ("The results indicated that during the years 2004-07, ENERGY STAR buildings in the CoStar database had higher occupancy rates, higher direct rental rates, higher sales price per square foot, and, after 2005, lower cap rates than non-ENERGY STAR buildings"); *see also* EICHOLTZ *supra* note 63 ("There is a clear inverse relationship between market value and energy usage—among buildings that have all been certified as energy efficient."); Mooz, *supra* note 9 ("We are starting to see compressed cap rates. 3 projects in Atlanta, Chicago, and Phoenix last 3 months set record prices in the market. [For example,] 1180 Peachtree set the high water mark for [the Atlanta] market. Cap rates are starting to be impacted."). *But see* Voss, *supra* note 49 ("[A] LEED platinum [building recently] sold to a German investment group .50 basis point cap rate compression. We're not convinced there's a premium for buyers. A green building will appeal to a broader group, so more investors interested, bidding up the property. But we're not convinced investors will say, I'll pay this cap rate versus another. Green projects experience higher lease up and higher retention, which will help the NOI income stream. Investors in theory should be willing to pay higher value, but not necessarily compressed cap rates."); Interview with Joseph Cahoon, Managing Dir., The Real Estate Fin. & Inv. Ctr. at the McCombs Sch. of Bus., in Austin, Tex. (Nov. 9, 2010) (noting that he was unable to underwrite a lower cap rate on a deal he recently consulted on in Austin).

69 HASSELL, *supra* note 48.

70 *Id.*



codes mean that a particular developer's model may only work in a few jurisdictions.[71] Fragmentation occurs horizontally because many developers in one particular region are competing with one another and do not communicate with their competitors.[72] Fragmentation also occurs vertically because firms often handle only one aspect of building construction.[73] The result of the fragmentation is that it is extremely difficult for the disparate stakeholders to effectively communicate (even directly from the consumer to the producer) what the consumer actually demands or for a government agency, academic institution, or nonprofit organization to communicate the true costs and true benefits to decisionmakers and stakeholders.[74] At each step of the vertical process, there are transaction costs associated with information transfer as illustrated in the diagram above. "The net effect of fragmentation is that it increases the number of people who need to learn about an innovation and it decreases the efficiency with which they can learn about it."[75]

But not all stakeholders have an equal role in the proliferation of green buildings. Notably, private developers of large commercial buildings—which are the focus of this paper—make most decisions to build large private buildings. Two major factors influence the decisions of private developers: returns on equity capital and availability of

71 *Id.* ("because codes vary from place to place and firms tend to be small, many homebuilders work in only one or a few jurisdictions . . . .").
72 *Id.* at 47.
73 *Id.*
74 HASSELL, *supra* note 48, at 47–48.
75 *Id.* at 48.

financing (which maximizes the rate of return on equity).[76] See the diagram on the previous page for the chain of decisionmaking in high-density development.[77]

In large-scale, high-density development, the private developer initiates the project. Projecting the rents and expenses, the developer determines whether a particular piece of land can support a project. A project can be supported if the price of the land and the cost of building, when financed, are outpaced by the income generated by the collection of rents. Where there is positive income—positive cash flow—the building can then be sold to an institutional capital group that wants stable returns on its equity. While all of the stakeholders have an interest, in the case of large-scale, high-density development, there is at least a centralized decisionmaker—the private developer. The private developer seeks one thing: return on equity. This return is based on the availability and the cost of capital, in terms of financing. Where financing is readily available and inexpensive, it is easier to achieve a higher rate of return.[78] With a higher ratio of loan-to-value, less equity of the developer is tied up in the project.[79]

The price an investing buyer is willing to pay for a property is based on the projected positive net cash flow.[80] This depends on the income stream of the building less the expenses (such as property taxes, insurance, and financing payments).[81] If the building is capable of producing higher income from increased rent, then the buyer will be willing to pay more for the property. Therefore, if a developer can achieve higher rents through a green building, they will achieve and capture gains on the back

76 Walters, *supra* note 46 (describing the yield potential as the primary motivation for private development).

77 BROWN, *supra* note 4, at 17.

78 Walters, *supra* note 46 (noting that the "Availability and cost of capital [is] a very definite [f] actor [sic]. The economics for new development are only just now starting to make sense on a very limited basis. Available debt financing has been greatly curtailed (limited to 60% - 65% loan-to-cost), terms are stiff, pricing is high relative to indexed rates, and lenders expect top-drawer sponsorship and personal recourse from principals. This means much more equity is required in the capital stack, and the weighted average cost of capital has gone up commensurately.").

79 Assume, for simplicity's sake, a $100 million project. Say the loan-to-value ratio is 50%. That means a developer must put $50 million of equity capital into the project. Assume further that the project takes one year to build and one year to lease up. Therefore, in order to realize a 10% annualized return on equity, the developer must sell the building for $110 million (assuming an interest rate of 0). Change the loan-to-value ratio to 80% ($20 million of equity for the developer). The annualized rate of return on equity in this case is 25%, more than double where loan-to-value is 50%. As interests rates increase, the bottom line of return also decreases. If the interest rate in the second case increases to 5%, the annualized return on equity drops to around 5%.

80 *See, e.g.*, Michael Devaney, *Time Varying Risk Premia for Real Estate Investment Trusts: A GARCH-M Model*, 41 Q. REV. ECON. & FIN. 335, 341 (2001) (describing how real estate investment trusts use capitalization rates to evaluate investment properties).

81 *Id.* Additionally, a prospective lender could reduce their credit risk by securing the carbon credits obtained (under a cap-and-trade regime) by the reduction of carbon output achieved by the building. For a discussion of the legal issues surrounding the potential use of carbon credits as collateral to secure financing, *see* George M. Padis, *Carbon Credits as Collateral*, 16 J. TECH. L. & POL'Y (forthcoming fall 2011) (on file with the *Texas Environmental Law Journal*).

end, when the building is sold, and while the building is being leased up until a buyer is found.

Therefore, as opposed to detached homes, there is really only one major hurdle to green development in high-density projects: demonstrating higher rents to developers and to lenders.[82] The various other stakeholders—contractors, architects, insurers,[83] etc.—will follow the developer's lead. The higher costs associated with green building, if they are realized in rent growth, will be absorbed by the developer in large-scale, high-density projects. Further, there is likely to be spillover from the large developers to the more disparate, fragmented homebuilders.[84] Therefore, if government focuses its policies on encouraging lenders and private developers of large commercial properties to undertake green development, the fragmentation problem can largely be avoided.

In addition to the myriad and disparate interest groups involved in green building, there are significant agency and institutional obstacles to the sustained economic implementation and proliferation of green buildings. Although many of the benefits are external, even the theoretically internal benefits (such as reduced energy prices, improved health, and increased productivity) have not proved to affect developers' decisionmaking in the marketplace. Therefore, legal strategies for green building should target these specific problems. These solutions are discussed in Section V.

IV. Synthesis and New Perspectives

A. The Cost Premium Tends to Be Overestimated

The limited data from the questionnaires indicate that, relative to the scholarship, most developers surveyed overestimate the costs of green building. The scholarship suggests that achieving LEED Silver adds an the average cost premium of between 1%–3%.[85] One study suggests that practitioners may be skeptical of the data because they believe that the scholarship is based on theoretical (estimates, assumptions, and forecasts) as opposed to empirical evidence (real-life documented data).[86] On the other hand, one practitioner I interviewed observed that developers tend to overestimate cost because most of them lack an "integrated model [and therefore] cannot truly mea-

82 Tobias, *supra* note 9, at 10.

83 At least one insurer already offers a 5% discount for energy efficient buildings. *See* News Release, Fireman's Fund Insurance Company, Fireman's Fund Insurance Company Now Offers Discount for Energy Star Labeled Buildings (June 28, 2010). http://www.firemansfund.com/Documents/PressRelease-06-28-2010_Energy_Star.pdf ("Fireman's Fund Insurance Company . . . . announces that policyholders with Energy Star buildings are eligible for a five percent discount.").

84 *See* Voss, *supra* note 49 (noting that government was an early adopter of green building, followed by commercial real estate, followed by homebuilders, suggesting that homebuilders follow commercial real estate's lead).

85 *See, e.g.*, Kats, *supra* note 18, at 15 (analyzing 18 LEED Silver buildings and determining that the cost premium was 2.11%); Issa, *supra* note 50 (summarizing the results of various studies). *But see* e-mail from Kyle Brock, Senior Vice President of Fin., Novare Grp., to author (Nov. 2, 2010, 8:29 CST) (on file with author) ("I believe it would be difficult to isolate [the premium for LEED Silver] statistically.").

86 Issa, *supra* note 50, at 1707.

sure the costs."[87] Nonetheless, there is a consistent gap between scholars' data about green building costs and the perceptions of practitioners.

B. Rents Are Internalized According to Scholarship

The argument against the principal–agent explanation for the slow adoption rate of green building relies on the assumption of perfect information.[88] The reality is that (sadly for economists) we do not live in a world of perfect information. Therefore, tenants may not know about the utility savings—although it certainly would be in the interest of the landlord to disclose that to attract more tenants. It is more likely, however, as the Issa and Eicholtz articles strongly suggest, that the gap is at the practitioner level (considering the economic argument for green development).[89] At least one study demonstrates that, not only do occupants of green buildings pay more in rent or purchase price, this spread is larger than what would be expected from energy savings alone—suggesting some additional benefit, such as increased productivity or marketing differentiation:

> The results suggest that an otherwise identical commercial building with an Energy-Star certification will rent for about three percent more per square foot; the difference in effective rent is estimated to be about six percent. . . . A ten percent decrease in energy consumption leads to an increase in value of about one percent, over and above the rent and value premium for a labeled building. However, the intangible effects of the [Energy-Star] label itself — beliefs about worker productivity or improved corporate image, for example — also seem to play a role in determining the value of green buildings in the marketplace. . . . The energy efficiency of capital inputs can be signaled to the owners and tenants of buildings very cheaply and the evidence suggests that the private market does incorporate this information in the determination of rents and asset prices.[90]

This data suggests that commercial tenants may indeed internalize energy savings into their rental decisions. Therefore, landlords may be able to cheaply signal savings to tenants, perhaps even residential tenants.[91]

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87 Mooz, *supra* note 9.

88 *See supra* Section II.B.

89 Issa, *supra* note 50, at 1710 ("Practitioners are not confident enough in work [on green building] conducted by researchers, and as such are not ready to validate or endorse any of that work yet.").

90 EICHOLTZ, *supra* note 63, at 33–34.

91 *But see* Walters, *supra* note 46 (suggesting that tenants may be unwilling to pay higher costs). Residential tenants in particular may not pay higher rents. *See* Cahoon, *supra* note 68 (observing that residential tenants in particular have been unwilling to internalize energy savings and arguing that residential rents are based on "market rents period").

C. These Problems Are Exacerbated by Behavioral Economics

From a behavioral standpoint, the (perceived) uncertain, long-term benefit of energy savings is going to be dwarfed—often irrationally—by immediate short-term cost.[92] Therefore, in green building there are potential challenges caused by market failure—the high transaction costs associated with differentiated stakeholders—and irrational actors. In addition to the fact that the benefits are largely external, those benefits that are internal are undermined by behavioral economics. Further, sunk costs and institutional inertia remain a problem in real estate, an industry that is slow to adopt change.[93]

Institutional inertia and sunk costs in existing systems are a significant concern.[94] In addition to inertia and sunk costs, many commercial actors are simply unfamiliar with the process. Suppose, for example, there is a law firm that specializes in land-use issues, and a developer asks the firm to estimate the legal fees for the entitlement of a green building. Well, suppose this firm has never done this before (likely in today's market).[95] To create a brand-new set of contracts and applications in an unfamiliar field will probably be an expensive proposition, especially when compared to the familiar land-use issues (where the firm has a plethora of already completed documents and lawyers with great familiarity and expertise). How does the law firm estimate the bill? At an hourly billing rate of $300, suppose it would take the firm 200 hours of attorney time to research these issues and draft appropriate documents. That's an up-front cost of $60,000. Do you bill the client for that time? Presumably, in the future, more green developments will occur and the firm will have these documents ready to go and on the cheap. But that future is uncertain. So, do you bill the client? For many firms, the answer has to be yes. This imposes additional barriers on the client developer to initiate green development. Further, future clients will "free ride" on the coattails of the client who initially signs off on these documents.[96] This parable demonstrates the problem in the case of each of the market players beyond the example law firm. Developers are unfamiliar with the process, architects are unfamiliar with the process, and even city planners are unfamiliar with the process.[97]

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92 Larry Karp, *Global Warming and Hyperbolic Discounting*, 89 J. Pub. Econ. 261, 277–78 (2005).

93 Brown, *supra* note 4, at 20–23.

94 Mooz, *supra* note 9 ("[Many firms lack] an integrated model, so they cannot truly measure costs").

95 *See* Vault, Guide to the Top 100 Law Firms: 2010 Edition (2009) (listing the top 100 law firms of which only one—Greenberg Traurig LLP—names green building as one of its major practice areas whereas 25 firms list land use and over 50 list real estate).

96 *See* Adam B. Jaffe et al., *A Tale of Two Market Failures: Technology and Environmental Policy*, 54 Ecological Econ. 164, 166–67 (2005) ("A firm that invests in or implements a new technology typically creates benefits for others while incurring all the costs. The firm therefore lacks the incentive to increase those benefits by investing in technology.").

97 Issa, *supra* note 50, at 1709–10. Note, however, that as the process is developed, the external benefit to the firm of the increased expertise and familiarity greatly reduces the cost over time. This is a strong argument for the implementation of policy to spur development. Not only do government projects and policies increase familiarity among market participants, this reduces costs permanently. This "adoption externality" from familiarity will be discussed at length *infra* in the solutions section.

The gap between the perception of developers and the results of the scholarship might be explained by behavioral economics, because the increased rents and purchase price would be uncertain and in the future. Behavioral economics suggests that such a long-term, uncertain benefit in the face of a certain cost is not measured apples to apples by irrational actors.[98] While the benefits of an average energy cost savings of $100/month would more than account for a $75 increase in rent over a five-year lease for a commercial office, it would be subjected to hyperbolic discounting because the savings would be uncertain and in the future.[99] Therefore, although altogether irrational, this tenant decision would not be affected by the benefits of green development as much as by the cost.

Another factor affecting this decision is the salience effect. The salience effect finds that individuals attach disproportionate weight to the most psychologically vivid and observable factors.[100] Intangible benefits such as increased productivity, improved health, and improved quality of life are difficult to quantify and are therefore unlikely to proportionately impact the decisions of a consumer of office, retail, or housing space—especially when compared to an easy-to-quantify, definite factor such as the price of rent.[101] Therefore, developers may be more sensitive to up-front capital costs rather than the less vivid and observable reduced future operating costs or enhanced productivity and quality of life achieved through green building.[102]

The major driver of building projects (because of the high capital involved) is financing.[103] Financing in the form of construction loans and in the form of purchasers

98 *See, e.g.*, Colin F. Camerer & George Lowenstein, Behavioral Economics: Past, Present, Future 3 (October 25, 2002) (unpublished draft), *available at* http://www.hss.caltech.edu/~camerer/ribe239.pdf (describing loss aversion as a counterexample to the assumptions of classical economics).

99 For a definition of hyperbolic discounting, see *id.* at 26 ("Hyperbolic time discounting implies that people will make relatively far-sighted decisions when planning in advance – when all costs and benefits will occur in the future – but will make relatively short-sighted decisions when some costs or benefits are immediate."). One example of hyperbolic discounting is Social Security. Social Security presumes that the public will tend to overconsume now rather than save for the future. To combat this, a policy imposes a mandatory savings program. Because people realize they will not save on their own—implicitly accepting the theory of hyperbolic discounting—they support the popular Social Security program to force them to save. Benjamin A. Malin, *Hyperbolic Discounting and Uniform Savings Floors*, 92 J. PUB. ECON. 1986, 1986 (2008).

100 Gillingham, *supra* note 10, at 17.

101 *But see* EICHOLTZ, *supra* note 63, at 34 ("effects of the label itself – beliefs about worker productivity or improved corporate image, for example – also seem to play a role in determining the value of green buildings in the marketplace.").

102 Or they may believe that their tenants will fail to appreciate the future savings as much as the rent price. *See*, Fuller, *supra* note 52 ("[Green development is] about making money. 20%–40% reduced utility costs. Tenants aren't believing the story yet, and failing to appreciate utility savings."). Further, institutional inertia may also be a problem because developers are intensely focused on managing costs.

103 *See, e.g.*, Charles Leung, *Macroeconomics and Housing: A Review of the Literature*, 13 J. HOUSING ECON. 249, 253 (2003) (describing the interrelationship between macroeconomic factors such as interest rates and housing growth).

of the buildings (seeking a steady income stream) drives new construction and development.[104] Because of the uncertainty associated with whether tenants will pay for the upfront costs associated with green development, lenders are reluctant to finance the more expensive building.[105] Most lending is done on a comparison basis—comparing the income stream projected by a developer to current income streams of similar projects.[106] This is done on an extremely localized, market-specific level.[107] Because it is unclear whether tenants will pay more for green construction, lenders are uncomfortable underwriting additional income above-market rents.[108] Without that additional income, it is very difficult for a lender to finance the additional costs associated with green development.[109]

V. Legal Strategies and Solutions

Government should work to encourage high-density green development because of its positive external benefits to society.[110] If, however, green building provides internal benefits to consumers (tenants), and those consumers are willing to pay higher rents because of those benefits, then it stands to reason that green building will occur. Higher rents increase the revenue, and—provided that the increased costs are lower than the increased revenues—that increased revenue will be realized by the developer.

Development, however, is not quite that simple. One major constraint (or impetus) to development is the availability of financing. Forecasting income streams is based on comparable projects, and such comparables are often geographically specific. The story that needs to be credibly told to lenders is that, because the building will achieve higher rents, it will achieve higher revenue—making it more attractive when it comes time to sell and thereby making the loan a safer credit risk. Lenders, however, do not need (or want) stories. They need and want comparable projects and certain-

104 *See id.*

105 Tobias, *supra* note 9, at 10 ("many green developers report that lenders and investors are reluctant to recognize additional investment value in green features with respect to energy cost savings or consumer appeal. Similarly, many commercial real estate lenders and investors feel that they are "flying blind" when asked to assess the value of green commercial real estate projects, noting the lack of lending and investment guidelines dealing specifically with green buildings." (citation omitted)).

106 *See, e.g.*, Ill. Hous. Dev. Auth., IDHA Multifamily Underwriting Guidelines 6 (2010), *available at* http://www.ihda.org/admin/Upload/Files//f93d19e1-f357-487f-b57c-96450ee36785.pdf (indicating that total operating budget of the project "must be supported by financial audits of comparable properties").

107 *See id.*

108 Tobias, *supra* note 9, and accompanying text.

109 *Id.*; *see also supra* notes 46–50 and accompanying text; Voss, *supra* note 49 ("Lenders talk a lot about sustainability, but do not offer a lower interest rate [to compensate for the] reduced risk. A lender is more likely to provide debt, but there is no reduction of rate or an increase of loan-to-value. A lot of talk, but for now, stays in the 'talk' phase.").

110 *See supra* notes 2–16 and accompanying text.

ty.[111] Therefore, government should act as a bridge, providing public financing based on future rent streams to overcome the misconceptions of green building.[112]

Admittedly, if government were to finance the construction of a green building where private lenders would be unwilling to, and the benefits of green building supported higher rents, the developer would receive a windfall. Setting this distributive reality aside for the moment, the achievement of higher rents would have a positive effect on the entire community. Unlike the development of a green technology through a patent, where the knowledge is by definition proprietary, the rents achieved through a public–private partnership to finance green development could be shared. Rents are usually a matter of public consumption—a developer can simply call up an apartment building, ask what the rent is, and ask if there are any units available.[113] Once a building is fully leased, the entire community of lenders and developers would have a comparable property to forecast rents from.[114]

Also, as architects, builders, and city planners become more familiar with the process, costs will fall. The so-called information externality principle states that, as someone does a specific task, they gain experience, skill, and thereby efficiency.[115] Therefore, government support of green building will have amplified effects throughout the community beyond the specific buildings, enabling organic, economically supported development.

Because of the distributive effect—enriching developers—and the information externalities, green building policies should "sunset" and phase out after a period of two-to-five years. Once a critical mass of green building begins to occur, the efficien-

111 Tobias, *supra* note 9, at 11; *see also* Walters, *supra* note 46 (suggesting increased clarity about returns is needed before green building is feasible).

112 Another potential solution would be the implementation of a cap-and-trade scheme, followed by reforms to Article 9 of the U.C.C. to enable the collateralization of carbon credits produced by green building. *See generally* Padis, *supra* note 81.

113 This may be more challenging in a commercial lease for a retail store—since they are longer in term, and there may not be vacancies. Further, so-called "anchor tenants" receive discounts in order to lure other tenants to a location. The inference holds true, however, for office buildings and residential leases.

114 By ascertaining the occupancy rate and the rents, a competitor could readily determine the income stream of a building with reasonable accuracy. Expenses, on the other hand, would remain proprietary; but managing costs is how the developer adds value to the transaction. Further, that side is not as uncertain to a developer, more a matter of negotiation and management with the contractors. By projecting cost structure with a premium for LEED certification, and then the likely higher rents, a developer would get a relatively certain picture of the prospects of the project. Furthermore, there are many research companies that provide this type of data. *See, e.g.*, REALQUEST, http://www.realquest.com (last visited Dec. 1, 2010) (providing users with "property and ownership data and analytics").

115 CHRISTIAN EGENHOFER, ET AL., EUR. CLIMATE PLATFORM, LOW-CARBON TECHNOLOGIES IN THE POST-BALI PERIOD: ACCELERATING THEIR DEVELOPMENT AND DEPLOYMENT 2 (2007), *available at* http://www.cleanegroup.org/assets/Uploads/2011-Files/Reports /CEPSLowCarbonTechnologiesinthePost-BaliPeriodDec07.pdf (describing the adoption externality as "'learning-by-doing,' [which] describes how production costs tend to fall as manufacturers gain production experience. If this learning spills over to benefit other manufacturers without compensation, it can represent an additional adoption externality.").

cies will become apparent, costs will be reduced, and green building will continue organically without policy support.

A. Public–Private Finance Through Tax Increment Financing (TIF)[116]

One possible legal mechanism for public–private finance is Tax Increment Financing (TIF). TIF laws exist in 49 states (including Texas) and the District of Columbia.[117] TIF is most often used for redevelopment of economically blighted urban areas, but it could probably be adapted to encourage green building.[118] TIF essentially earmarks the increased property taxes and sales taxes from the economic development of a specific area for infrastructure to support that development.[119] The increased revenue from the economic growth over time finances the initial spending that spurred that growth.[120] In some cases, the municipality can issue bonds backed by the projected increased revenue.[121] In the case of a green development, the municipality can issue a bond and then use the proceeds to lend to the development.[122] While the government would be lending where a private lender would not, the government would appreciate the interest spread (between the bond payments—which would already be mostly covered by the TIF—and the loan). Also, private lenders are not financing these projects because of actual risk, but rather because of an irrationally perceived risk due to behavioral failures, market failures, and information asymmetries.[123] Therefore, the credit risk of a green building may not be substantially higher than a normal project or may even be lower.[124]

116 Special thanks to Kyle Brock, Senior Vice President of Fin., Novare Grp. for this idea. Brock, *supra* note 56.

117 Richard Briffault, *The Most Popular Tool: Tax Increment Financing and the Political Economy of Local Government*, 77 U. Chi. L. Rev. 65, 65 (2010) (citing Council of Dev. Fin. Agencies & Int'l Council of Shopping Ctrs., Tax Increment Finance: Best Practices Reference Guide 1 (2007)).

118 Brock, *supra* note 56 ("TIF financing is usually tied to affordable housing in the residential arena, but it could just as easily be tied to sustainability for any type of development.").

119 Briffault, *supra* note 117, at 66.

120 *Id.*

121 *Id.* at 68.

122 *See id.* ("The bond proceeds are then used to make major public investments upfront, thus jumpstarting the development process."). In this case, the bond proceeds can be lent to the developer as public–private finance.

123 *See supra* Section III.C.

124 *See, e.g.*, Voss, *supra* note 49 ("Green projects experience faster lease up and higher [tenant] retention rate, leading to a more stable NOI income stream.").

B. Reduce Entitlement Risk

Further, entitlement risk[125] remains a constraint to development generally.[126] To spur green development, the process should be more transparent and accelerated for green builders in particular. Green development warrants preferential treatment because of its significant social benefits to the community[127]—benefits which, as previously discussed, are largely external to the developer[128] but nonetheless appreciated by the community. By decreasing entitlement risk, municipal governments could encourage development by ensuring that capital spent on permitting would not be lost chasing projects that eventually get denied.[129] Further, this policy costs the government almost nothing.

One way to both decrease entitlement risk and spur development is through redevelopment areas. In a redevelopment area, the city government can undertake an area-wide environmental impact report (EIR).[130] With an EIR in place that analyzes the amount of development a particular zone could support, one hurdle in the development process is cleared and risk is reduced.

C. Tax Exemptions

In addition to these strategies, policies should be adopted that subsidize green development because of its significant social benefits. Considering that a tax or cap on carbon output remains politically infeasible,[131] and many of the benefits from green building enjoyed by society cannot be captured by individual private developers,[132] subsidies may be appropriate. Municipal governments may consider carving an exemp-

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125 The risk that through the permitting process, the building will be denied necessary permits. This danger is amplified in the case of green development, because often the developer is relying on tax credits or government incentives to make the project feasible—which require review and permits to achieve.

126 *See, e.g.*, Walters, *supra* note 46 ("[Entitlement risk is a d]efinite challenge for us. . . . [W]e have lost millions of dollars in failed entitlement pursuits, frequently based on vague and subjective criteria. Our trophy quality projects such as The Triangle, The Quarters student housing, and The Mosaic at Mueller are standout projects of the highest quality. And still we have suffered large losses in pursuit of many projects in which we were not successful either directly with the City, or indirectly through the City approval process. And often these losses have given way to larger out-of-town/out-of-state developers . . . .").

127 *See supra* notes 16–18 and accompanying text.

128 *See supra* notes 2–16 and accompanying test.

129 *See supra* note 125 and accompanying text.

130 *See, e.g.* CITY OF MENLO PARK, REQUEST FOR PROPOSAL FOR MENLO PARK DUMBARTON TRANSIT STATION AREA SPECIFIC PLAN 6 (2008), *available at* http://www.menlopark.org/departments/pln/dumbarton/dumbarton_RFP.pdf (describing the commission of a programmatic EIR for the development area).

131 *See* Juliet Eilperin, *More Signs of Warming, but Legislative Climate Still Cold*, WASH. POST, Sept. 24, 2010, at A04 ("weakened political support for curbing emissions means the United States is unlikely to impose national limits on greenhouse gases before 2013, at the earliest. Several leading GOP candidates this fall are questioning whether these emissions even cause warming, while some key Democratic Senate candidates are disavowing the cap-and-trade bill the House passed in 2009.").

132 *See supra* notes 2–16 and accompanying text.

tion from some property taxes for green buildings and projects, as Nevada has already done.[133] Because of the increased demand of local labor and services, the reduction of GHGs, and the improvement of productivity and quality of life, an exemption from property tax would be appropriate, and may increase the overall welfare more than the revenue would. Further, development fees[134] could be curtailed for green developments.

D. Secondary Loan Market

An additional means of incentivizing the financing of green developments (on a more macroeconomic level) would be to create a secondary loan market for green development construction loans, perhaps through the Department of Housing and Urban Development (HUD).[135] A national secondary loan market (specifically for construction lending for green development projects) would free up capital to fund more projects.[136] Essentially, it would increase the number of lenders, enabling specific lenders to lend more money.[137] The competition among lenders for suitable projects would drive up loan-to-value ratios and reduce the overall cost of capital, making green development more feasible.

The creation of a secondary loan market would (perhaps artificially) drive down interest rates and increase loan-to-value ratios, perhaps exposing the government to additional credit risk—risk individual lenders would not otherwise take on without a secondary loan market to which they could shift the risk.[138] However, if in the long term green building is supportable because it drives increased rents, then the risk perceived by banks is truly less than they perceive.[139] In which case, the interest rates are not "artificially" reduced, they are accurately reduced—the perceptions of lenders are

133 *See, e.g.*, Nev. Rev. Stat. Ann. § 701A.110 (2009) ("the Director shall grant a partial abatement from the portion of the taxes imposed pursuant to chapter 361 of NRS, other than any taxes imposed for public education, on a building or other structure that is determined to meet the equivalent of the silver level or higher by an independent contractor authorized to make that determination in accordance with the Green Building Rating System . . . .").

134 *See, e.g.*, City of Austin, Permit Fee Schedule 1 (2010), *available at* http://www.ci.austin.tx.us/development/onestop/downloads/fees_permit_schedule.pdf.

135 *See, e.g.*, Federal National Mortgage Associations Act, 12 U.S.C. § 1716 (2010) ("The Congress declares that the purposes of this subchapter are to establish secondary market facilities for residential mortgages, to provide that the operations thereof shall be financed by private capital to the maximum extent feasible, and to authorize such facilities to—(1) provide stability in the secondary market for residential mortgages . . . (4) promote access to mortgage credit throughout the Nation . . . by increasing the liquidity of mortgage investments and improving the distribution of investment capital available for residential mortgage financing . . . .").

136 *See generally*, Stuart A. Gabriel & Stuart S. Rosenthal, *Do the GSEs Expand the Supply of Mortgage Credit? New Evidence of Crowd Out in the Secondary Mortgage Market*, 94 J. Pub. Econ. 975 (2010) (describing how the government sponsored entities (GSEs) Fannie Mae and Freddie Mac provide liquidity and ultimately concluding that they provide net positive liquidity, though in some periods they may compete against the private secondary loan market).

137 *Id.*

138 *See, e.g.*, Jacob Werret, Note, *Achieving Meaningful Mortgage Reform*, 42 Conn. L. Rev. 319, 325, 333 (2009) (criticizing the GSE securitization of the mortgage loan market).

139 *See supra* note 46 and accompanying text.

simply wrong. Further, even if artificial, a secondary loan market would be appropriate because of the social benefits of green development, especially when compared to the secondary loan market for detached homes, which impose a much larger burden in terms of GHG production and overall energy demands.[140]

VI. CONCLUSION

This note has argued that focusing on large development avoids the structural obstacle of market fragmentation. Further, the principal–agent explanation for the "energy paradox" in green building is at best incomplete. It is more likely that information asymmetry on the part of developers and capital partners is responsible for the lag time between green building adoption and what would be predicted by cost–benefit analysis. These information asymmetries are exacerbated by behavioral economics specific to green building. Considered with the positive external benefits of green building to the community and the relatively low cost of appropriate legal options to bridge the gap, there is a strong case for the implementation of targeted legal solutions to intelligently encourage green building and pave the way for a brighter, more efficient future for the built environment.

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140 BROWN, *supra* note 4, at 10 tbl.1 (comparing detached single family units—59% of total units, 73.4% total BTUs—with high density—15.9% of total units, 7.5% total BTUs. High density is demonstrably more energy efficient to start).

Recent Developments

Air Quality

New Source Review and the Texas State Implementation Plan

In the latest round of developments between the Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ) over air quality standards, EPA appears set to approve revisions to Texas's State Implementation Plan (SIP) that would define certain key terms within the New Source Review program. Approval and Promulgation of Implementation Plans in Texas, 76 Fed. Reg. 42078 (July 18, 2011) (to be codified at 40 C.F.R. pt. 52). The Clean Air Act (CAA) requires each state to adopt and submit a SIP to EPA, describing how the state will implement, maintain, and enforce various federal ambient air quality standards within its borders. 42 U.S.C. § 7410 (2011). To obtain approval from EPA, each state's SIP must set forth requirements at least as stringent as the applicable federal requirements or guidance. *Id.* § 7416.

At issue in the proposed rule are terms within the New Source Review program, a permitting process within the CAA that governs the construction and renovation of stationary sources of air pollution. 40 C.F.R. § 51.160 (2011). On July 18, 2011, EPA published a proposed rule in the Federal Register that would approve: (1) an introductory paragraph for the definition of "modification of existing facility"; (2) an exclusion for the maintenance and replacement of equipment; and (3) an exclusion for an increase in annual hours of operation to Texas's SIP for certain new source-review permits. 76 Fed. Reg. at 42079. Additionally, the rule would withdraw EPA's prior proposed disapproval of several related provisions. *Id.* at 42080. If approved, the proposed rule would address discrepancies between Texas's SIP and the relevant Texas Administrative Code provisions, as well as help EPA satisfy outstanding legal obligations as part of an earlier settlement agreement over delayed rulemaking. *Id.* at 42079-42080.

The New Source Review program requires owners of current or future stationary sources of air pollution to obtain a permit before they begin construction or make certain modifications. 40 C.F.R. § 51.160. Three types of permits exist, based on the size of the stationary source and whether they are located in an area that meets

the National Ambient Air Quality Standards (NAAQS): 1) prevention of significant deterioration permits, which are required for the construction or major modification of a major source in an attainment area; 2) nonattainment NSR permits, which are required for the construction or major modification of a major source in a nonattainment area; and 3) minor source permits, which are required for sources that do not meet the threshold for a major source or modification. *See* 40 C.F.R. §§ 51.165, 51.166(a). A major stationary source is one that emits or has the potential to emit more than 100 tons per year of a pollutant. 40 C.F.R. § 51.160. The purpose of minor source permits is to prevent the construction of smaller stationary sources that would either jeopardize compliance with NAAQS or would violate the control strategy in place for areas out of compliance with the standard. U.S. Envtl. Prot. Agency, *Minor NSR Basic Information*, http://www.epa.gov/NSR/minor.html (last updated July 22, 2011). The proposed rule addresses defined terms related to the permitting process for modifications to existing minor stationary sources. 76 Fed. Reg. at 42078.

Texas has submitted three revisions to its SIP regarding the definition of "modification of existing facility" for minor source permits under Title 30, chapter 116 of the Texas Administrative Code *Id.* at 42079. These revisions were submitted on March 13, 1996, July 22, 1998, and September 4, 2002. *Id.* At present, the current EPA-approved Texas SIP does not include the definition that Texas has incorporated within its own rules under Chapter 116. *Id.* EPA's proposed rule would conform to Texas's rules by adopting an introductory paragraph defining "modification of existing facility," as well as two exclusions to the term in 30 TEX. ADMIN. CODE § 116.10(9) (Tex. Comm'n on Envt'l Quality, Control of Air Pollution by Permits for New Construction of Modification, Definitions) and incorporate it into the Texas SIP. *Id.*

EPA proposes to define "modification of existing facility" as "any physical change in, or change in the method of operation of, a facility in a manner that increases the amount of air contaminants emitted by the facility into the atmosphere or which results in the emission of any air contaminant not previously emitted." *Id* at 42080. As part of its evaluation, EPA compared Texas's definition at 30 TEX. ADMIN. CODE § 116.10(9) with the definition of modification found in 40 C.F.R. § 52.01(d) and 42 U.S.C. § 7411. *Id.* EPA found the definitions "substantially the same," and its technical analysis concluded that the proposed rule would meet the standards set out in the CAA and the New Source Review regulations. 76 Fed. Reg. at 42080.

The proposed rule would also approve two exclusions to the introductory definition of "modification of existing facility" within the SIP—an exclusion for the maintenance and replacement of equipment and an exclusion for an increase in the annual hours of operation. *Id.* at 42079. The first exclusion, at 30 TEX. ADMIN. CODE § 116.10(9)(B), allows stationary sources to avoid triggering the requirements for a modification of an existing facility if the modification involves the maintenance or replacement of equipment components "that do not increase or tend to increase the amount or change the characteristics of the air contaminants emitted into the atmosphere." *Id.* In proposing approval of Texas's revisions to 30 TEX. ADMIN. CODE § 116.10(9)(B), EPA found that it avoids emission increases. *Id.* at 42081. The second exclusion, located at 30 TEX. ADMIN. CODE § 116.10(9)(C), would allow stationary sources to avoid triggering permit requirements for "an increase in the annual hours of operation unless the existing facility has received a preconstruction permit or has been exempted, under TEX. HEALTH & SAFETY CODE § 382.057, from preconstruction permit require-

ments." *Id.* at 42081. EPA also proposes approval of the exclusion proposed in section 116.10(9)(C) because the language mirrors the definition in the TCAA, which was already incorporated into the Texas SIP as consistent with the federal requirements in 40 C.F.R. 52.01(d)(2)(ii). *Id.*

As part of its action, EPA also proposes to withdraw its prior proposed disapprovals to certain exclusions under § 116.10(9) that related to insignificant increases in emissions. 76 Fed. Reg. at 42079 (citing 74 Fed. Reg. 48450 (Sept. 23, 2009)). On October 5, 2010, TCEQ submitted to EPA revisions that amended Section 116.10(11)(A) and repealed Section 116.10(11)(B). *Id.* With the repeal of Subparagraph (B), EPA considers the issue moot. *Id.* at 42080. Also, EPA has decided to address the revisions to Subparagraph (A) in a separate future action. *Id.* at 42079.

EPA's approval of Texas's rules implements a settlement agreement stemming from a suit brought by the Business Coalition for Clean Air Appeal Group complaining of EPA's delays in approving Texas's SIP. *Id.* at 42080. As part of the settlement, EPA must act on the NSR Rules Revisions by October 31, 2011. *Id.* Final approval of the NSR rules revision helps EPA fulfill its settlement obligation and resolves at least one issue in an ongoing dispute between EPA and TCEQ over Texas's approach to regulating air quality.

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Natural Resources

Listing the Dunes Sagebrush Lizard under the Endangered Species Act and its Impact on Oil and Gas Production in Texas

In December 2011, the U.S. Fish and Wildlife Service (FWS) is expected to announce its decision, almost three decades in the making, on whether to place the dunes sagebrush lizard (DSL) on the Endangered Species List. Frequently Asked Questions Regarding the FWS Proposal to List the Dunes Sagebrush Lizard 4, http://www.fws.gov/southwest/es/Documents/DSLQandAs042011.pdf (last visited Sep. 26, 2011). The DSL is a rare reptilian species found in southeastern New Mexico and a small part of west Texas. WildEarth Guardians, Fighting for Survival: Sand Dune Lizard 1, http://www.wildearthguardians.org/site/DocServer/Factsheet_sand_dune_lizard.pdf (last visited Sep. 26, 2011). This region, known as the Permian Basin, is one of the leading oil and gas producing regions in the United States. *Id.* The DSL is most commonly found near shinnery oak trees located throughout the region. *Id.* Environmental and conservation groups, such as WildEarth Guardians, urge the listing of DSL on the Endangered Species List, claiming the species faces significant risk to its well-being from "poorly regulated oil and gas exploitation, shinnery oak removal, off-road vehicle use, toxic fumes, and other factors that are compounded by the extremely narrow range of the species." WildEarth Guardians, Request for Emergency Listing

of the Sand Dune Lizard (Sceloporus arenicolus) Under the Endangered Species Act, (2008), http://www.wildearthguardians.org/support_docs/petition-emergency_sand-dune-lizard_4-9-08.pdf.

The DSL was first classified as a candidate subspecies for federal protection under the Endangered Species Act (ESA) in 1982. Endangered and Threatened Wildlife and Plants, 47 Fed. Reg. 58454 (proposed Dec. 30, 1982) (to be codified at 50 C.F.R. pt. 17). Since then, the FWS reclassified the DSL a number of times. *See* Endangered and Threatened Wildlife and Plants, 50 Fed. Reg. 37958, 37963 (proposed Sep. 18, 1985) (to be codified at 50 C.F.R. pt. 17); *see also* Endangered and Threatened Wildlife and Plants 59 Fed. Reg. 58982 (proposed Nov. 15, 1994) (to be codified at 50 C.F.R. pt. 17). After dropping it from the candidate list in 1996, the FWS restored the DSL to the list in 2001 as a full species with a Priority 2 ranking. Endangered and Threatened Wildlife and Plans, 66 Fed. Reg. 54808, 54811 (proposed Oct. 30, 2001) (to be codified at 50 C.F.R. pt 17). A Priority 2 ranking indicates the species faces high-magnitude, imminent threats to its survival. In the following years, little progress was made in moving the DSL from the candidate list to the Endangered Species List. WildEarth Guardians, *supra* at 4. On April 9, 2008, WildEarth Guardians filed a formal petition for the emergency listing of the DSL under the ESA. See Request for Emergency Listing, *supra*.

Two years later, on December 14, 2010, FWS issued a proposed rule to place the DSL on the Endangered Species List and opened the public comment period until February 14, 2011. Endangered and Threatened Wildlife and Plants: Endangered Status for Dunes Sagebrush Lizard, 76 Fed. Reg. 19304 (Apr. 7, 2011) (to be codified at 50 C.F.R. pt. 17). On April 7, 2011, FWS reopened the period for public comments, extending it until May 9, 2011. *Id.* Public meetings were held in April 2011 in Midland, Texas, and Roswell, New Mexico, to discuss the issues surrounding the decision to list the DSL. *Id.*

As a result of the public comments, a vigorous debate emerged on whether to place the DSL under federal protection. Environmental and conservation groups argue that the DSL population declined dramatically due mainly to the oil and gas production in the region and that the species is on the verge of extinction. Request for Emergency Listing, *supra*, at 3. These groups contend that oil and gas production in the Permian Basin causes disturbances to the DSL's shinnery oak habitats, leading to the drastic decline in their population. *Id.* at 7. Additionally, the environmental and conservation groups claim that herbicides, used to control the growth of shinnery oak trees in the region, also contribute to the DSL population's decline. *Id.* at 12. Supporting studies indicate the use of herbicides has caused a 70-94% decline in lizard population. *Id.*

On the other side of the debate, oil and gas producers, ranchers, and numerous government officials are against placing the DSL on the Endangered Species List. These opponents have two main arguments against granting the DSL federal protection. First, the scientific evidence put forth by the environmental groups is lacking in certain key aspects. Letter from Susan Combs, Texas Comptroller of Public Accounts, to Dan Ashe, Director, U.S. Fish and Wildlife Service (Aug. 9, 2011) (on file with author). Second, the opposition argues there will be substantial and costly repercussions if the DSL is placed on the Endangered Species List. *Id.* On May 25, 2011, the Texas House of Representatives passed a resolution urging FWS to withdraw its proposal to place the DSL on the Endangered Species List. Tex. H.R. 1944, 82nd Leg., R.S. (2011).

The opponents argue that the evidence and data used by the environmental groups to support their claim that the DSL is on the verge of extinction are not being accurately represented. The Texas General Land Office (TGLO) stated that, "federal biologists depended on data from the 1960s to determine the lizard's known distribution. Surveys done in 2006 and 2007 focused on lizards in New Mexico. The lizards were only found in three locations in Texas." *Dunes Sagebrush Lizard*, Texas General Land Office, http://www.glo.texas.gov/glo_news/hot_topics/articles/dunes-sagebrush-lizard.html (last visited Sept. 24, 2011). Furthermore, the TGLO notes that neither the environmental groups nor the FWS considered alternative factors such as prolonged drought conditions, natural predators, and diseases, all of which could have contributed to the DSL's population decline. *Id.*

Next, the opponents focus on the potentially devastating economic effects of placing the DSL on the Endangered Species List. According to the TGLO, placing the DSL on the Endangered Species List will negatively impact the economies of the following Texas counties: Gaines, Andrews, Ward, Winkler, and Crane. *See id.* These counties are rich in oil and gas resources. *Id.* As a whole, the Permian Basin region produces about 20% of the nation's crude oil. Letter from Susan Combs to Dan Ashe, *supra*. The listing of the DSL, they argue, will cause a rippling effect, resulting in the loss of thousands of jobs in the oil and gas industry. *See id.* Some groups fear that listing the DSL on the Endangered Species List will negatively affect the nation's energy security. *See* Letter from Susan Combs, Texas Comptroller of the Public Accounts, to Michelle Shaughnessy, U.S. Fish and Wildlife Service (Aug. 4, 2011) (on file with author), *available at* http://texasahead.org/texasfirst/resources/task_force/priority/reference_docs/dsl/US_Fish_and_Wildlife_Service.pdf. Additionally, they are concerned that the public education system in Texas may be affected since the Permanent University Fund owns an estimated 75,000 acres of land in the region. *Dunes Sagebrush Lizard, supra.* According to University officials, if the DSL is placed on the Endangered Species List, about 1,000 oil and gas wells could be stopped from further drilling and production, which in turn will negatively affect the revenue of the Permanent University Fund. *See id.*

While there is no simple solution to this problem, alternatives have been presented in an effort to mitigate the possible harmful consequences of listing the DSL. The TGLO states that listing the DSL is not the most effective solution, suggesting instead that the federal government work in cooperation with energy companies to develop conservation agreements to help protect the DSL, as was done in New Mexico. *Id.* The GLSO contends that developing conservation agreements would protect the DSL from extinction while allowing the oil and gas industry to continue to operate. *Id.* Also, Texas Comptroller Susan Combs has requested a six-month delay in listing the DSL while additional scientific study is conducted. Letter from Susan Combs to Dan Ashe, *supra*.

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SOLID WASTE

EPA's Proposed Revisions to RCRA's Definition of Solid Waste

The Environmental Protection Agency (EPA) is proposing revisions to certain recycling exclusions from the definition of solid waste under the Resource Conservation and Recovery Act's (RCRA). Definition of Solid Waste (DSW), 76 Fed. Reg. 44094 (proposed July 22, 2011) (to be codified at 40 C.F.R. pts. 260, 261, 266). Since the exclusions were first adopted in October 2008, two developments have prompted the current proposed revisions. *Id.* at 44095.

First, EPA's analysis of the impact of the rule on environmental justice pursuant to Executive Order 12898 concluded the rule could pose a disproportionately adverse impact on minority and low-income populations. *Id.* at 44103-44104

Second, EPA has proposed revisions as a result of a settlement agreement with the Sierra Club over the Sierra Club's 2009 administrative petition to have the 2008 rule revoked. *See id.* at 44101-44102. In its petition, Sierra Club argued that the revised regulations were unlawful and increased threats to public health and the environment without producing compensatory benefits. *Id.* at 44101. Sierra Club specifically singled out the lack of regulatory definitions for key conditions of the rule and disagreed with EPA's finding that the rule would have no adverse environmental impacts on environmental justice communities and children's health. 76 Fed. Reg. at 44101. Responding to the petition, a coalition of industry associations argued that the rule comported with case law construing the scope of the definition of "solid waste" under RCRA and that the 2008 DSW rule achieved significant economic and conservation benefits while imposing significant controls on the hazardous secondary material recycling industry that are fully protective of the environment. *Id.*

A 2009 settlement agreement between EPA and the Sierra Club required Sierra Club to withdraw its petition and EPA to address the Sierra Club's issues in proposed revisions to the rule no later than June 30, 2011. *Id.* at 44102.

Concurrent with the administrative petition, the American Petroleum Institute (API) and the Sierra Club filed separate court challenges to the 2008 DSW rule under RCRA § 7006(a). *Id.* at 44101. These cases are currently before the United States Court of Appeals for the District of Columbia. It remains unclear how the recent proposed rule will affect the ongoing litigation.

Transfer-Based Exclusion

EPA's proposed rule would replace the transfer-based exclusion, currently codified at 40 C.F.R. §§ 261.4(a)(24). *Id.* at 44096. The transfer-based exclusion exempts from EPA's definition of solid waste hazardous secondary materials that are transferred from the generator to a different party, whether in the U.S. or a foreign country, for the purpose of reclamation. 40 C.F.R. §§ 261.4(a)(24)-(25) (2010). Under the current rules, to qualify as a valid exclusion, the hazardous secondary materials must meet numerous conditions, including the following:

- The secondary hazardous material may not be speculatively accumulated;
- The secondary hazardous material may not be handled any other facility other than the hazardous secondary material generator, intermediate facility or reclaimer;
- Reclamation of the material must be legitimate;
- The secondary hazardous material must be contained;
- The generator must make reasonable efforts to ensure the reclaimer intends to properly and legitimately reclaim the hazardous secondary material along with records that reasonable efforts were made at each reclamation facility, records of all off-site shipments made and received; and
- EPA must be notified of volumes and types of materials and any changes to plans.

Id. at § 261.4(a)(24). EPA proposes replacing the entire exception with a different set of regulations because, according to EPA, the transfer of hazardous secondary materials to third-party reclaimers usually involves a certain amount of discard, and "the conditions of the 2008 DSW final rule have serious gaps that could create a potentially unacceptable likelihood of adverse effects to human health and the environment from such discarded material." 76 Fed. Reg. at 44108.

Under the new regulations, hazardous recyclable material would be treated largely as hazardous waste subject to the solid waste regulations. *Id.* at 44110. However, generators would be allowed to accumulate hazardous recyclable material for up to one year without a permit or interim status to make reclamation more economical. *Id.* To take advantage of the one-year storage exemption, the generator must notify EPA or the state. *Id.*

Exclusion for Hazardous Secondary Materials Reclaimed Under the Control of the Generator

Under the 2008 rule, hazardous secondary materials legitimately reclaimed under the control of the generator are also excluded from the definition of solid waste. 40 C.F.R. § 261.4(a)(23) (2010). EPA's proposed rule would retain the exclusion for materials reclaimed under the control of the generator while adding a regulatory definition of "contained" to 40 C.F.R. § 260.10, along with some record-keeping and notice requirements:

> "A hazardous secondary material is contained if it is managed in a unit, including a land-based unit as defined in § 260.10, that meets the following criteria: (1) The unit is in good condition, with no leaks or other continuing or intermittent unpermitted releases of the hazardous secondary materials to the environment, and is designed, as appropriate for the hazardous secondary material, to prevent releases of the hazardous secondary materials to the environment. Such releases may include, but are not limited to, releases through surface transport by precipitation runoff, releases to groundwater, wind-blown dust fugitive air emissions, and catastrophic unit failures; (2) the unit is properly labeled or otherwise has a system (such as a log) to immediately identify the hazardous secondary materials in the unit; and (3) the unit does not hold incompatible materials and addresses any potential risks of fires or explosions." 76 Fed. Reg. at 44114.

During the 2008 rulemaking process, EPA contended that: (1) such a detailed definition was unnecessary for hazardous secondary materials since they are handled as valuable products destined for recycling; and (2) regulatory authorities could decide whether hazardous secondary materials were sufficiently contained in a storage unit on a site-specific basis. *Id.* Now, EPA believes such a definition is necessary since the original rule provides no specific guidance on what constitutes adequate containment. *Id.* Because containment is one of the major requirements of the generator-controlled exclusion, EPA notes, the lack of specificity might undermine the exclusion. *Id.* The agency believes the proposed change will decrease the inherent likelihood of discard under the 2008 rules while maintaining the flexibility of the implementing authority to make circumstance-specific determinations as necessary. *Id.*

DISTINGUISHING BETWEEN "LEGITIMATE" AND "SHAM" RECYCLING

Certain hazardous secondary materials are not classified as solid waste and, therefore, are not subject to the RCRA Subtitle C regulatory system. *Id.* at 44117. Because of the economic incentives for avoiding such regulation, EPA proposes to distinguish between "legitimate" and "sham" recycling. 76 Fed. Reg. at 44118. Specifically, EPA proposes a redefinition of the word "legitimacy," including applying the codified definition to all recycling regulated under 40 C.F.R. §§ 260-266; mandating the four legitimacy factors, of which only two are currently mandatory; and requiring documentation. *Id.* at 44118-44119.

Under the proposed rule, recycling of a hazardous secondary material is legitimate if: (1) the hazardous secondary material provides a useful contribution to the recycling process or to a product or intermediate of the recycling process; (2) the recycling process produces a valuable product or intermediate; (3) the generator and recycler manage the hazardous secondary material as a valuable commodity; and (4) the products of the recycling process contain hazardous constituents at levels equal to or lower than those of analogous products and must not exhibit a hazardous characteristic that analogous products do not exhibit. *Id.* Under the 2008 rule, the first two are mandatory, and the last two need only be considered but not necessarily met. 40 C.F.R. § 260.43 (2008).

REVISIONS TO SOLID WASTE VARIANCES AND NON-WASTE DETERMINATIONS IMPACT

EPA is also proposing changes to solid waste variances and non-waste determinations. For variances, the agency's proposed rule would revise 40 C.F.R. §260.33(c) to require facilities to reapply for a variance if the circumstances on which a solid waste variance was based change. 76 Fed. Reg. at 44126-7. Additionally, facilities receiving variances would be required to provide notification. *Id.* For partial reclamation variances, the proposed rule would revise the criteria found in 40 C.F.R. § 260.31(c) to include a clearer explanation of when a variance applies and to require that the criteria for the variance be evaluated collectively. *Id.* at 44128. EPA is also proposing to revise the criteria for non-waste determination, requiring petitioners to explain why they cannot or should not have to meet the existing DSW exclusions. *Id.* at 44129-31. Finally, the proposed rule would designate the Regional Administrator as EPA recipient of petitions for variances and non-waste determinations. *Id.* at 44131.

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Water Quality and Utilities

City of Waco v. Tex. Comm'n on Envtl. Quality, 346 S.W.3d 781 (Tex. App.—Austin, pet. filed)

On June 17, 2011, in *City of Waco v. TCEQ*, the Third Court of Appeals reversed an earlier decision by the 201st District Court of Travis County. *City of Waco v. Tex. Comm'n on Envtl. Quality*, 346 S.W.3d 781 (Tex. App.—Austin, pet. filed). The new opinion limits the Texas Commission on Environmental Quality's (TCEQ) discretion in deciding whether a third party has the right to a contested case hearing in permitting decisions. *Id.* at 827.

Over the past decade, the dairy industry northwest of the City of Waco (Waco) has boomed. *Id.* at 793. This area covers land in and around the North Bosque River, which feeds Lake Waco, the primary source of Waco's water supply. *Id.* Waste and nutrient runoff from the dairy operations can negatively impact the water's quality. *Id.* Therefore, Waco has led the charge in seeking tougher regulations to restrict the dairies' activities. *Id.*

The O'Kee Dairy ("Dairy"), a concentrated animal feeding operation (CAFO), is located approximately 82 miles upstream from Lake Waco in the North Bosque watershed. *City of Waco*, 346 S.W.3d. at 798. CAFOs are considered point sources of pollution and must obtain water quality permits. Tex. Comm'n Envtl. Quality, 30 Tex. Admin. Code § 321.33(a) (West 2011). The Dairy obtained its first CAFO permit in 1999. *City of Waco*, 346 S.W.3d at 793. CAFO permits require dairies to maintain ponds, known as retention control structures (RCS), to collect the waste runoff from the area where cows are confined. Tex. Comm'n Envtl. Quality, 30 Tex. Admin. Code § 321.37(c) (West 2011). The RCS must be sufficiently large to prevent the waste from escaping into nearby waterways. *Id.* Additionally, CAFO permits allow operators to use a certain amount of their animal waste as fertilizer in waste application fields (WAF). *Id.* § 321.42(i).

TCEQ determined the area of the North Bosque where the Dairy is located is "impaired" due to excessive nutrients and aquatic plant growth. *City of Waco*, 346 S.W.3d at 793. Classification of the area as impaired triggered a requirement for TCEQ to determine a total maximum daily load (TMDL) for the area. 33 U.S.C. § 1313(d)(1)(C) (2011). A TMDL is the maximum amount of pollutants that can be discharged into a segment of the waterway. *Id.* In 2004, TCEQ adopted legally enforceable TMDL rules aimed at reducing the amount of phosphorus levels (the primary cause of algal growth) in the river by fifty percent. *City of Waco*, 346 S.W.3d at 794.

Meanwhile, other legislation also created stricter environmental regulations for the area. *Id.* In 2001, the Texas legislature imposed new environmental restrictions on CAFOs in major single source impaired zones (MSSIZ), which at the time only included the North Bosque watershed. *Id.* The legislation required each existing CAFO in a MSSIZ to obtain an individual permit by 2004. *See* TEX. WATER CODE ANN. §§ 26.501-.504 (West 2011). Previously, CAFOs could obtain general permits that were exempted from contested case hearings. *See id.* § 26.503(a). By removing the exemption, the statute made CAFO permit proceedings more open to contested case hearings. *City of Waco*, 346 S.W.3d at 794. At about the same time, EPA adopted stricter rules for CAFOs related to waste management and recordkeeping. *Id.* (citing 68 Fed. Reg. 7176 (Feb. 12, 2003)). Subsequently, TCEQ promulgated its own rules implementing the new state legislation and EPA rules, effectively requiring the Dairy to include more stringent water-protection measures in its amended permit. *Id.* at 794-795.

Chapter 26 of the Texas Water Code governs CAFO water quality permits. *See* TEX WATER CODE ANN. §§ 26.001-.562 (West 2008). Among other requirements, Chapter 26 mandates that TCEQ grant a public hearing on a permit application to any "affected person" who requests one. *Id.* § 26.028(c). However, TCEQ does not have to grant a public hearing if: (1) the application does not authorize the discharge of significantly increased levels of pollutants or "change materially the pattern or place of discharge"; and (2) the permit will maintain or improve the quality of the waste discharge. *Id.* §26.028(d).

To the extent Chapter 26 requires public notice and an opportunity for public hearing, the Legislature enacted §§ 5.551-.558 of the Texas Water Code to detail the procedures TCEQ must follow. *City of Waco*, 346 S.W.3d at 789. When an entity seeks a major amendment to a wastewater discharge permit, there is an opportunity for a contested case hearing. *See* 30 Tex. Admin Code § 55.201. The requestor must file a written request within thirty days after TCEQ releases a draft permit. *Id.* § 55.201(a), (c). To qualify for a contested case hearing, the requesting entity must be an "affected person" as defined in § 5.115 of the Texas Water Code. TEX. WATER CODE. ANN. § 5.556(c). Additionally, contested case hearings must address a disputed question that is relevant and material to the permit application and that was raised during the comment period. *Id.* § 5.556(d)(1).

In March 2004, the Dairy submitted a request to amend its CAFO permit to increase the total allowed head of cattle from 690 to 999 and its WAF acreage from 261 to 286.4 acres. *City of Waco*, 346 S.W.3d at 788. TCEQ classified the request as a major amendment. *Id.* at 792. Subsequently, TCEQ's Executive Director prepared a draft permit, accepting the major points of the Dairy's application while adding several measures aimed at strengthening environmental protections. *Id.* at 792-793. These measures included restricting total waste application and increasing the storage capacity of the Dairy's RCSs. *Id.* at 793.

Waco timely submitted comments opposing the proposed permit and requested a public meeting, which TCEQ granted. *Id.* at 795. Following the public meeting, TCEQ's Executive Director responded to Waco's comments, agreeing to make several changes to the permit provisions, but otherwise rejecting Waco's legal and factual assertions. *Id.*

Waco then filed a timely request for a contested case hearing, invoking the right of an "affected person" on its own behalf and as *parens patriae* for its citizens. *City*

of Waco, 346 S.W.3d at 795. The request incorporated Waco's original comments, replied to the Executive Director's response, and outlined the legal and factual issues Waco disputed. *Id.*

TCEQ's Executive Director filed a timely response, opposing Waco's request for a contested case hearing, arguing that Waco was not an "affected person." *Id.* at 796-797. The Executive Director also argued that, under the permit: (1) very little waste would be discharged from the Dairy; and (2) any discharged waste would be diluted before it could affect Waco's water supply. *Id.* at 797. In support of these conclusions, the Executive Director attached a map of the area. *Id.* at 798.

Waco responded by offering an expert's affidavit to support its reasoning and points from its original request for a contested case hearing. *City of Waco*, 346 S.W.3d at 798.

After another public meeting, TCEQ's Executive Director denied Waco's hearing request without referring it to the State Office of Administrative Hearings (SOAH). *Id.* Waco sought judicial review in the district court, which subsequently upheld TCEQ's decision. *Id.* at 799. Waco then appealed the district court's decision to the Third Court of Appeals. *Id.*

Waco put forth two arguments in support of its basic assertion that TCEQ and the district court erred in denying its request for a contested case hearing: (1) TCEQ's decision is based on an erroneous construction of "affected person"; and (2) the factual bases underlying TCEQ's decision are flawed. *Id.*

The Third Court of Appeals analyzed the "affected person" issue de novo, noting it was a question of law. *Id.* TCEQ claimed the court must give deference to its construction of the statute. *City of Waco*, 346 S.W.3d at 800. However, judicial deference is only appropriate when the statute in question is ambiguous. *Id.* (citing *Railroad Comm'n of Tex. v. Tex. Citizens for a Safe Future & Clean Water*, 336 S.W.3d 619, 624-625 (Tex. 2011)). Also, if the statute is ambiguous, the agency's interpretation must be reasonable. *Id.*

On the one hand, Waco argued that "affected person" must be defined broadly, consistent with case law supporting an expansive view of standing to participate in administrative hearings. *Id.* at 801. On the other hand, TCEQ argued that the Legislature intended just the opposite, pointing to case law addressing constitutional standing requirements in judicial proceedings, which are generally more restrictive than requirements at the agency level. *Id.*

Agreeing with TCEQ in part, the Third Court noted that standing requirements to obtain a contested case hearing must reflect the constitutional standing requirements needed to challenge a decision in court. *Id.* (citing *Heat Energy Advanced Tech., Inc. v. West Dallas Coal. for Envtl. Justice*, 962 S.W.2d 288, 295 (Tex. App.—Austin 1998, no pet.)). However, the rule does not dictate a narrow interpretation of § 5.115. *See City of Waco*, 346 S.W.3d at 801. As the court noted, the Legislature unambiguously defined "affected person" for contested case hearings to mirror the standing principles outlined by the Third Court in *Stop the Ordinance Please v. City of New Braunfels*, 306 S.W.3d 919 (Tex. App.—Austin 2010, no pet.). *Id.* at 802. Thus, to have standing, Waco had to establish a concrete and particularized injury in fact that is: (1) actual or imminent; (2) fairly traceable to the issuance of the permit as proposed; and (3) likely to be redressed by a favorable decision on its complaint. *STOP*, 306 S.W.3d at 926-927. As the court stated, the standard is intended to prevent judicial decisions

from yielding mere advisory opinions or drawing the judiciary into generalized policy disputes. *City of Waco*, 346 S.W.3d at 803.

To be an "affected person," one must have a personal justiciable interest distinct from an interest common to the general public. TEX. WATER CODE ANN. § 5.115. Waco argued that it only needed to show some potential harm rather than prove the merits of its objections to show a personal justiciable interest. *City of Waco*, 2346 S.W.3d at 803. The court agreed in part, but held the potential harm "must be more than speculative." *Id.* at 805 (quoting *Save Our Springs Alliance, Inc. v. City of Dripping Springs*, 304 S.W.3d 871, 883 (Tex. App.—Austin 2010, pet. denied)). There must be some allegation or evidence to show that the person's interests will be affected by the action. *SOS Alliance*, 304 S.W.3d at 883.

Waco also asserted a personal justiciable interest in the permit application based on the 2001 MSSIZ legislation, which generally expanded access to contested case hearings. *City of Waco*, 346 S.W.3d at 806. At the time, the only MSSIZ in Texas was the North Bosque watershed. *Id.* at 794. This fact, Waco argued, shows the Legislature intended to protect Lake Waco and its water quality. *Id.* at 806. Therefore, denying the contested case hearing would render the legislation "a nullity." *Id.*

The Third Court disagreed, noting that legislative intent is derived first and foremost from the objective meaning of statutory language. *Id.* (citing *Lexington Ins. Co. v. Strayhorn*, 209 S.W.3d 83, 85 (Tex. 2006)). Because nothing in the MSSIZ legislation specifically addresses the right to a contested case hearing, then at most the MSSIZ legislation indicates Waco has a stake in the ongoing *policy* debate regarding CAFOs in the North Bosque area. *Id.* at 807. As a *judicial* matter, the MSSIZ legislation does not confer a personal justiciable interest. *City of Waco*, 346 S.W.3d at 807.

Still, the Third Court rejected TCEQ's contention that the Legislature intended that TCEQ interpret the personal justiciable interest standard "narrowly" or "restrictively." *Id.* TCEQ relied on anecdotal legislative history to support its claim. *Id.* However, the court observed that the objective meaning of the statutory text, which at no point supports TCEQ's position, must guide the search for legislative intent. *Id.* at 807-808 (citing *Entergy Gulf States, Inc. v. Summers*, 282 S.W.3d 433, 437 (Tex. 2009)).

The court analyzed TCEQ's claim that it has broad discretion to balance a set of factors (including policy and administration) in determining whether a requestor is an "affected person" with the right to a contested case hearing. *Id.* The court noted that any TCEQ discretion is necessarily constrained by § 55.203(c) of the Texas Administrative Code, which explicitly defines an "affected person" as having a personal justiciable interest. *Id.* at 808. Thus, TCEQ may only consider the factors insofar as they inform TCEQ's ultimate decision as to whether a person has a personal justiciable interest. *City of Waco*, 346 S.W.3d at .

Having analyzed the parties' "affected person" claims, the court considered the factual bases underlying each party's claims. *Id.* The court agreed with TCEQ that any interest claimed by Waco as *parens patriae* for its citizens is common to members of the general public and therefore not a personal justiciable interest. *Id.* at 810. A party requesting a contested case hearing must assert a property or economic interest sufficient to distinguish it from the general public. *Id.*

In fact, Waco claimed a legally protected interest predicated on its property/economic stake in the water quality of Lake Waco. *Id.* Waco presented undisputed evidence that it owns all water rights to Lake Waco, which is the sole source of water

supply for Waco's residents, and that the cost to Waco of water treatment is escalating. *Id.* at 809.

TCEQ argued that, because Waco could externalize the increased costs by charging more to its customers, its interest was really no different than that of the general public. *City of Waco*, 2011 WL 2437669, at 810. The court rejected this idea, reasoning that it would imply a municipality could never have a personal justiciable interest separate from the general public since it could always just raise the rates or taxes to address any water supply or quality problems. *Id.*

The court held Waco's undisputed evidence establishes, as a matter of law, Waco's legally protected property interest in the water rights to Lake Waco, as opposed to those of the general public that *might* give rise to a personal justiciable interest. *Id.* To prove a personal justiciable interest, Waco also had to show an injury to its legally protected interest in the water supply that is: (1) concrete and particularized, and actual or imminent (as opposed to conjectural or hypothetical); (2) fairly traceable to the issuance of the permit as proposed; and (3) likely to be redressed by a favorable decision. *Id.* at 810-811.

TCEQ did not argue that Waco's evidence and allegations, if true, were insufficient to prove the remaining criteria for a personally justiciable interest. Rather, TCEQ offered its own factual determinations, with the goal of negating the existence of a concrete and particularized injury fairly traceable to the issuance of the permit that could be redressed by its denial or further conditions/restrictions. *Id.* at 811.

The court turned first to the matter of evidence and the extent to which TCEQ is allowed to weigh evidence beyond what is contained in the written application, response, and reply. Previous versions of the Texas Water Code required a hearing requestor to present "compelling evidence" to support an application, but that requirement was removed from the code in 1999. *See* Act of May 30, 1999, 76th Leg., R.S., ch. 1350, § 1, 1999 Tex. Gen. Laws 4570. Currently, the Texas Water Code neither expressly allows nor denies the use of evidence in the process. TEX. WATER CODE ANN. § 5.115.

Arguing that it should be allowed to consider outside evidence, TCEQ analogized itself to a trial court deciding a plea to the jurisdiction, and the Third Court essentially agreed. *City of Waco*, 346 S.W.3d at 812. There is nothing, the court opined, categorically denying TCEQ the discretion to consider evidence in determining whether a party is an "affected person." *Id.* Since agencies are afforded considerable procedural flexibility, TCEQ was free to consider evidence in its decision. *Id.*

The court then discussed which standard it should use to review the validity of TCEQ's fact findings. TCEQ argued the court must use the substantial evidence test and affirm TCEQ's decision because there was substantial evidence in the agency record to support its findings. *Id.* at 813. In the substantial evidence test, the court must determine, as a matter of law, whether the record contains reasonable factual support for the agency's action. *Tex Health Facilities Comm'n v. Charter-Med.–Dallas, Inc.*, 665 S.W.2d 446, 452-53 (Tex. 1984). "The issue is not whether the agency reached the correct conclusion, but rather whether there is some reasonable basis in the record for its action." *City of El Paso v. PUC*, 883, S.W.2d 179, 185 (Tex. 1994). In the substantial evidence test, the burden is placed on the contestant to disprove the agency's findings and conclusions. *Collins v. Tex. Natural Res. Conservation Comm'n*, 94 S.W.3d 876, 881 (Tex. App.–Austin 2002, no pet.).

Waco argued that a substantial evidence review of an agency decision is inappropriate when there is no evidentiary hearing by the agency. *City of Waco*, 346 S.W.3d at 813. Such hearings allow a claimant the opportunity to test evidence through cross-examination and presentation of contrary evidence. *Id.* TCEQ's rules make it clear that consideration of a hearing request is not a contested case subject to the Texas Administrative Procedure Act (APA). Tex. Comm'n Envtl. Quality, 30 TEX. ADMIN. CODE § 55.211(a)(4) (West 2011). Waco claimed TCEQ's denial of its request was arbitrary and capricious and a denial of due process because Waco was not afforded an opportunity to test and rebut any of TCEQ's evidence. *City of Waco*, 346 S.W.3d at 814.

In the absence of specific statutory guidance on the issue, TCEQ relied on jurisprudence predating both the Texas APA and its predecessor, the Administrative Procedure and Texas Register Act, in arguing for the substantial evidence test. *Id.* at 815. In response, the court held TCEQ's interpretation was based on misinterpretations of the origins, nature, and purpose of the substantial evidence rule. *Id.* The court stated that, pre- and post-APA, substantial evidence review contemplates that the contestant is afforded an opportunity to confront and challenge the agency's factual basis for its decision—i.e. through a contested case hearing. *Id.* at 817.

Acknowledging ambiguity in the case law regarding substantial evidence review, the Third Court held the correct rule is found in *Tex. Dep't of Ins. v. State Farm Lloyds*, 260 S.W.3d 233 (Tex.App.—Austin 2008, no pet.). *Id.* Substantial evidence review is simply not possible absent the opportunity to develop the record through a contested case or adjudicative hearing. *State Farm Lloyds*, 260 S.W.3d at 245. Such a rule brings Texas into line with the United States Supreme Court. *See Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 414-415 (1971).

The Third Court observed that, because TCEQ successfully advocated the trial court to restrict its review to the agency record, Waco never had a chance to develop the evidentiary record through a contested case hearing or adjudicative process. *City of Waco*, 346 S.W.3d at 819. The court left open the question of whether such deprivation amounts to a violation of procedural due process because it found that TCEQ acted arbitrarily with respect to its findings of fact "independently and apart from whether substantial evidence could be said to support those findings." *Id.*

After briefly outlining the arbitrary and capricious standard as applied to agency action, the court stated that the agency acted arbitrarily in reaching its decision. *Id.* at 819-820. TCEQ failed to employ the required reasoned decision-making and hard look analysis in determining whether Waco might suffer the requisite concrete and particularized injury, fairly traceable to the issuance of the O-Kee Dairy permit and likely to be redressed by the denial of the permit or the imposition of additional conditions. *Id.*

TCEQ relied on *Collins* to argue that a proposed permit amendment that improves environmental protections—compared to the current permit—cannot be said to injure a hearing requestor. *Id.* at 820. The court agreed with Waco that TCEQ misinterpreted *Collins*, confusing the issue of standing with the merits of the case. *Id.* at 822. In *Collins*, a permit was exempted from contested case hearing requirements based on the facility's distance from residential and business structures. 94 S.W.3d at 883. Also, evidence showed the requestor was *completely* safe from any discharged waste. *Id.* In this case, on the other hand, it is clear the permit application is not exempted from the statutory contested case hearing requirements. *City of Waco*, 346 S.W.3d at 822.

It is likewise clear the permit explicitly contemplates waste discharge running off the CAFO and into the North Bosque watershed, which could harm Waco's legally protected interest, giving it a personal justiciable interest in the permit. *Id.* Importantly, whether the new permit is more protective than the original is irrelevant; all that matters is whether it could allow injury to the requestor's legally protected interest. *Id.* Thus, TCEQ acted arbitrarily to the extent it denied the hearing request because it relied on a factor that is irrelevant to Waco's standing to obtain a hearing. *Id.*

In the alternative, the court held, TCEQ abused its discretion to the extent it denied Waco standing based on the extent of the Dairy's waste discharge under the amended permit. *Id.* at 823. TCEQ could only determine the extent of the waste discharge by deciding some of the same factual issues that would entitle Waco to a contested case hearing on the merits. *Id.* As TCEQ admitted, certain issues regarding the extent of the discharge were disputed and subject to settlement in a contested case hearing. *City of Waco*, 346 S.W.3d at 823. If TCEQ relied on the extent of the discharge when it denied Waco standing, the issue of the extent of the discharge overlaps standing and the merits. *Id.*

Waco argued that TCEQ is legally barred from deciding facts which support the merits of its objections in the course of determining its standing to obtain a hearing on those same merits. *Id.* In response, TCEQ again analogized itself to a trial court, which can generally decide evidence-based jurisdictional challenges without having to hold a live hearing. *Id.* The Texas Supreme Court previously ruled, though, that a trial court's procedural discretion is sharply limited where disputed jurisdictional facts overlap with the merits of claims or defenses. *Tex. Dep't of Parks and Wildlife v. Miranda*, 133 S.W.3d 217, 227-228 (Tex. 2004). In such instances, the trial court can only dismiss a claim without a hearing if there is conclusive or undisputed evidence negating the challenged overlapping jurisdictional facts. *Id.* According to the Third Court in this case, TCEQ's discretion is similarly limited when it is determining disputed facts that are relevant to both a hearing requestor's standing and the merits of the permit application. *City of Waco*, 346 S.W.3d at 824.

The court analogized the contested case hearing under the Texas Water Code and TCEQ rules to a civil claimant's right to having disputed material fact issues determined at trial. "[A]n affected person is entitled to a contested case hearing on disputed questions of fact raised during the public comment period that are relevant and material to TCEQ's decision on a permit application." *Id.* Waco presented evidence that waste discharge under the amended permit would adversely affect the water quality of Lake Waco. *Id.* at 824-825. TCEQ's evidence regarding the extent of the waste discharge was therefore not undisputed or conclusive as required under *Miranda*. *Id.* at 825. Consequently, TCEQ abused its discretion in deciding issues related to the extent of the waste discharge without granting Waco a contested case hearing on those same issues.

Additionally, the court rejected TCEQ's argument that the Legislature granted it implied discretionary authority to consider a permit's likely effects in determining whether a contested case hearing requestor is an "affected person." *Id.* TCEQ maintained it was granted such authority based on its implied authority to determine whether a proposed permit is exempted from contested case hearing requirements under TEX. WATER CODE ANN. § 26.028(d). *Id.* The court disagreed, reasoning that these two issues are conceptually distinct: one involves whether TCEQ must afford an *oppor-*

tunity for a contested case hearing while the other goes to whether a particular person has standing to *request* such a hearing where the law requires an opportunity. *City of Waco*, 346 S.W.3d at 825. Thus, TCEQ's implied authority to decide exemptions to the contested case hearing requirements is irrelevant to whether it has discretion in determining a requestor's "affected person" status. *Id.*

Having dismissed TCEQ's relative protectiveness arguments, the court turned finally to TCEQ's argument that any discharge of waste by the Dairy will have no effect on Waco's legally protected interest. TCEQ's argument was based primarily on the Executive Director's unsworn testimony. *Id.* The court held that his testimony, unsupported by substantive evidence, could not substantiate TCEQ's argument. *Id.* at 826. TCEQ therefore acted arbitrarily in relying on the Executive Director's unsupported factual determinations.

For the reasons discussed above, the Third Court reversed the district court's judgment affirming TCEQ's order, reversed TCEQ's order, and remanded to TCEQ for further proceedings. *Id.* at 827. In this instance, the court valued the procedural safeguards of third parties over the agency's administrative discretion.

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BOSQUE RIVER COALITION V. TEX. COMM'N ON ENVTL. QUALITY, NO. 03-10-00475-CV, 2011 WL 3329586 (TEX. APP.—AUSTIN, PET. FILED)

On August 2, 2011, the Third Court of Appeals, in *Bosque River Coal. v. Tex. Comm'n on Envtl. Quality* (TCEQ), overruled a district court's denial of a contested case hearing request. No. 03-10-00475-CV, 2011 WL 3329586, at *1 (Tex. App.—Austin, pet. filed). The case centered on a standing issue involving questions of administrative standards and procedural fairness. The court, addressing a series of arguments presented by TCEQ, especially relied on the decisions in *City of Waco v. Texas Comm'n on Envtl. Quality* and *Texas Dep't of Parks & Wildlife v. Miranda* to elucidate this area of administrative law. 346 S.W.3d 781 (Tex. App.—Austin, pet. filed); 133 S.W.3d 217 (Tex. 2004).

The contested case request was filed by three members of the Bosque River Coalition ("Coalition"), each living 1.5-2 miles downstream from a concentrated animal feeding operation (CAFO) owned and operated by Gerben Leyendekker. *Bosque River*, 2011 WL 3329586, at *1-2. The Coalition members submitted the request in response to a preliminary decision by the Executive Director of TECQ to grant a "major" amendment to the existing water quality permit held by Leyendekker. *Id.* at *1. The amendment would raise the permitted maximum number of cows and allow the

CAFO to apply wastes from the CAFO in fields closer to Gilmore Creek and, thereby, closer to creekside property owned by Coalition members. *Id.* The permit also included certain protective measures, such as doubled storage capacity of dairy retention structures and expanded buffer zones, designed to counterbalance some of the effects of Leyendekker's expanded operations. *Id.*

TECQ rules allow for a contested case hearing to be brought under the Administrative Procedures Act (APA). Tex. Gov't Code Ann. §§ 2001.001-902 (West 2008). In response to the hearing request, TCEQ's Executive Director concluded that the Coalition met its procedural requirements but that, given the distance of the Coalition members from the CAFO and thus the low chance of harmful effects resulting from its operation, none of the members qualified as "affected persons" and thus lacked standing. *Bosque River*, 2011 WL 3329586, at *3. The district court agreed and upheld the denial of the contested case request. *Id.* at *4. The Coalition appealed. *Id.*

The first of TCEQ's arguments considered by the Court of Appeals involved the "substantial evidence" standard for reviewing agency decisions. The court conceded that the substantial evidence standard would require it to review only whether reasonable minds could have reached the conclusion the agency did. *Id.* (citing *H.G. Sledge v. Prospective Inv. & Trading Co.*, 36 S.W.3d 597, 602 (Tex. App.—Austin 2000, pet. denied)). However, relying on its decision in *City of Waco*, it noted that a substantial evidence standard is "'not possible' absent the opportunity to develop [the agency record] through a contested case or other adjudicative hearing." *Id.* at *7. Because the relevant agency proceedings were nonadjudicative in nature, the "Coalition never had the opportunity to develop an evidentiary record before TCEQ," thus the substantial evidence standard is inapplicable. *Id.*

The court next considered TCEQ's contention that the amended permit includes environmentally protective measures such that the Coalition cannot have a "justiciable interest in opposing it." *Id.* at *8. Again, citing and emphasizing aspects of its decision in *City of Waco*, the Third Court held that the existence of new protective measures is not in itself dispositive of whether the Coalition members will be affected or injured by the issuance of the amended permit. *Bosque River*, 2011 WL 3329586, at *8. In *City of Waco*, the fact remained that, despite protective measures, "discharge, run-off, or loading is an acknowledged certainty under the amended permit." *City of Waco*, 346 S.W.3d at 822. Similarly, in *Bosque River Coalition*, though not a certainty, there is some chance that the amended permit would affect or injure the Coalition members. *See Bosque River*, 2011 WL 3329586, at *8.

TCEQ next argued it was within its discretionary authority to weigh the relevant factors and reach a reasonable conclusion on the standing issue. *Id.* This argument follows from the *City of Waco* court's functional analogy that compared TCEQ's contested case procedure to that of trial courts. *Id.* There, the court noted the "well-established principle that trial courts, when determining jurisdictional issues such as standing, are not bound by allegations in pleadings but may—and sometimes must—consider evidence to the extent necessary to decide the issue." *Id.* However, the *City of Waco* court elaborated that such procedural discretion is limited when the disputed facts include those related to the determination of "affected person" status and thus to standing. *Id.* at *9. Citing the Texas Supreme Court case of *Texas Dep't of Parks & Wildlife v. Miranda*, the court continued the analogy, explaining that "where jurisdictional facts overlap with the merits of claims or defenses, the trial court lacks discre-

tion to dismiss a claim at a preliminary stage unless there is conclusive or undisputed evidence negating the challenged jurisdictional fact." *Id.* (citing *Miranda*, 133 S.W.3d at 228). Since there were disputed facts relating to the Coalition members' status as "affected persons," and thus the ability to have their day in court (or, as here, their chance at an administrative hearing), TCEQ lacked discretion to reach even a "reasonable conclusion" on the issue. *Bosque River*, 2011 WL 3329586, at *9.

Lastly, the court rejected TCEQ's argument that the Coalition's hearing request failed to substantiate its allegations with sufficient facts and, as a result, TCEQ was unable to evaluate the potential impacts. *Id.* Here, again, the court interpreted TCEQ's procedures for the determination of "affected person" standing as "impos[ing] what are essentially pleading requirements." *Id.* at *10. The request required only the identification of the members and a brief statement of how or why the proposed permit would affect the justiciable interest of the members. Tex. Comm'n Envtl. Quality, 30 TEX. ADMIN. CODE § 55.201(d). The court noted that "there is nothing in the water code or the rules that requires a hearing requestor to provide anything more." *Bosque River*, 2011 WL 3329586, at *10. Indeed, it went on to remind TCEQ that, "[w]hile prior versions of the water code and rules required a hearing requestor to supply 'competent evidence' in support of its request, that requirement was eliminated from the water code in 1999." *Id.*

Finally, the court concluded that TCEQ's determination on the "affected person" issue was "made through improper procedure, was affected by error of law, and was an abuse of discretion." *Id.* at *12. The court's opinion throughout is marked by an insistence on preserving substantial procedural safeguards for those who may be adversely affected by agency decisions.

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CASENOTES: FEDERAL

UNITED STATES V. RANGE PROD. CO., NO. 3:11-CV-116-F, 2011 WL 2469731, AT *1 (N.D. TEX. JUNE 20, 2011)

INTRODUCTION

On January 18, 2011, the United States filed suit in federal district court to enforce an Emergency Administrative Order (EAO), originally issued by the Environmental Protection Agency (EPA) under the Safe Drinking Water Act (SDWA). *United States. v. Range Prod. Co.*, No. 3:11-cv-116-F, 2011 WL 2469731, at *1 (N.D. Tex. June 20, 2011). In its EAO, EPA alleged contamination of groundwater from natural gas wells drilled by Range Production Company ("Range") near Fort Worth in the Barnett Shale formation. *Id.* at *2. On January 20, 2011, Range appealed the EAO to the 5th

Circuit. *Id.* at *3. The appeal is still pending. *Id.* On March 21, 2011, Range filed a motion to dismiss the district court's action based on two sections of the Federal Rules of Civil Procedure: 1) § 12(b)(1) — lack of subject matter jurisdiction; or, alternatively, 2) § 12(b)(6) — failure to state a claim. *Id.* at *1. In its motion to dismiss, Range also argued that EPA violated procedural due process with its EAO. *Id.*

On March 22, 2011, the Texas Railroad Commission (RRC), which separately and concurrently investigated Range's production activities, determined the groundwater contamination was not caused by the Range wells. Oil & Gas Docket No, 7B-0268629, Commission Called Hearing to Consider Whether Operation of the Range Production Company Butler Unit Well. No. 1H (RRC ID 253732) and Teal Unit Well No. 1H (RRC ID 253729) in the Newark East (Barnett Shale) Field, Hood County, Texas, are Causing or Contributing to Contamination of Certain Domestic Water Wells in Parker County, Texas (Tex. R.R. Comm'n, March 22, 2011), http://www.rrc.state.tx.us/meetings/ogpfd/7B-68629-commcalled-epa.pdf; *see also* News Release, Tex. R.R. Comm'n, *Railroad Commissioners Find Range Resources' Natural Gas Not Source In Parker County Water Wells* (Mar. 22, 2011), http://www.rrc.state.tx.us/pressreleases/2011/032211.php. RRC determined that the gas in the water was from the Strawn formation, a shallower formation than the Barnett. *Id.* The district court simply noted RRC's finding but did not give it any weight. *Range Prod.*, 2011 WL 2469731, at *4.

Contaminated Wells and the Emergency Administrative Order

In 2009, aiming for natural gas in the Barnett Shale, Range drilled two gas wells to depths of approximately one mile. *Id.* at *2. Two nearby residents had been and were continuing to use groundwater pumped from wells approximately 200 feet deep. *Id.* One of these water wellheads was 470 feet from a Range gas wellhead, and the other water wellhead was 120 feet from the same gas wellhead. *Id.* EPA alleged that both residents first noticed problems with their wells' water pressure and water quality in late 2009. *Range Production*, 2011 WL 2469731, at *2. In August 2010, EPA began conducting tests of water wells in the area. *Id.* EPA found methane and benzene in the water and determined that the contamination was likely caused by Range's gas drilling. *Id.*

On December 7, 2010, EPA issued an EAO to Range under the SDWA. *Id.* at *3. EPA alleged that the two Range gas wells caused the contamination of nearby water wells. *Id.* In its EAO, EPA further alleged that, by contaminating groundwater, the Range wells caused "an imminent and substantial endangerment" to people. *Id.* EPA directed Range to: (1) notify EPA within 24 hours whether it intended to comply with the EAO; (2) provide clean water to the users of the contaminated wells; (3) install explosivity meters at the houses of the well water users; (4) submit a survey listing all water wells within 3,000 feet of the two gas wells; (5) submit a plan to conduct soil and air tests within 14 days; and (6) to submit a plan to identify gas flow pathways to the Trinity Aquifer. *Range Production*, 2011 WL 2469731, at *3. The EAO also notified Range that it might be subject to a civil penalty of up to $16,500.00 for each day of violation. *Id.*

The District Court's Decision

Range argued that the court lacked subject matter jurisdiction under § 12(b)(1) because the EAO was not a final agency action. *Id.* at *5. The court rejected the argument, holding that the EAO qualifies as final agency action under the two-prong test

of *Bennett v. Spear*: "(1) the action must mark the consummation of the decision-making process, and not be of a tentative or interlocutory nature, and (2) the action must be one . . . from which legal consequence will flow." *Id.* at *7 (quoting *Bennett v. Spear*, 520 U.S. 154, 177-8 (1997)). The court further found that the EAO itself indicates a decision was made and that Range may be subject to legal consequences in the way of significant penalties if the court grants relief. *Id.*

Regarding the § 12(b)(6) and procedural due process issues, Range argued that EPA did not plead facts showing that Range caused the contamination, as required by *Twombly* and *Iqbal*. *Id.* at *5 (citing *Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 555 (2007); *Ashcroft v. Iqbal*, 129 S. Ct. 1937, 1949 (2009)). Further, Range argued, since it was never afforded an opportunity to contest the findings supporting the EAO, Range was not afforded due process. *Range Production*, 2011 WL 2469731, at *8. EPA countered that it only need plead that Range violated the EAO, not that Range caused the contamination and that Range's property interests do not require due process protection. *Id.* at *6-8. Disagreeing, the court held that Range's due process rights were indeed implicated by the possibility of hundreds of thousands of dollars in penalties and surveying and testing costs. *Id.* at *6.

Range also argued that enforcing the EAO and assessing penalties without affording Range a chance to challenge EPA's findings would violate procedural due process. *Id.* at *8. Citing 9th and 11th Circuit cases, Range argued that administrative penalties may only be based on actual, proven, not merely alleged violations. *Id.* (citing *Sackett v. U.S. Envtl. Prot. Agency*, 622 F.3d 1139, 1144 (9th Cir. 2010); *Tenn. Valley Auth. v. Whitman*, 336 F.3d 1236, 1258 (11th Cir. 2003)). EPA attempted to distinguish this case on the grounds that it was an emergency situation involving imminent danger, and "summary administrative action may be justified in emergency situations." *Id.* (quoting *Hodel v. Virg. Surface Mining & Reclamation Ass'n, Inc.*, 452 U.S. 264, 299-300 (1981)).

Noting the strength of both sides' arguments, the court admitted this is a difficult issue and declined to deliver a resolution. *Range Production*, 2011 WL 2469731, at *9. Instead, the court denied without prejudice Range's motion to dismiss and stayed the litigation pending resolution of Range's 5th Circuit appeal. *Id.* at *9. The court reasoned that it ought not to make a resolution because the pending 5th Circuit decision may "either (1) moot this action by invalidating the [EAO], or (2) provide the court with guidance and a framework with which to proceed, as it could provide . . . the answer to whether the 5th Circuit's review sufficiently satisfies due process." *Id.*

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Casenotes: State

Railroad Comm'n of Tex. v. Tex. Citizens for a Safe Future & Clean Water, 336 S.W.3d 619 (Tex. 2011).

The Texas Supreme Court accorded the Railroad Commission ("Commission") significant deference with respect to the Commission's interpretation of the term "public interest" in connection with injection well permitting in *Railroad Commission of Texas v. Texas Citizens for a Safe Future & Clean Water*. 336 S.W.3d 619 (Tex. 2011). The Court held that the Commission is not required to weigh factors outside of its jurisdiction in determining whether a proposed permit was in the "public interest." *Id.* at 632. The decision offers a clear indication of the deference Texas courts should give to agencies' statutory interpretations.

Pioneer Exploration, Ltd. ("Pioneer") applied to the Commission for a permit to convert an existing well into an injection well for the disposal of oil and gas waste. *Id.* at 622. Specifically, Pioneer sought the permit to dispose of contaminated water produced as a result of hydraulic fracturing operations. *Id.* Most such water is disposed of in injection wells. *Id.* Converting a well into an injection well for oil and gas waste requires a Commission permit. Tex. Water Code § 27.031 (2008). To grant such a permit, the Commission must find that the use or installation of the injection well is in the "public interest." *Id.* § 27.051(b)(1).

Respondents, Texas Citizens for a Safe Future and Clean Water and James Popp ("Texas Citizens"), opposed Pioneer's permit application. *RRC v. Tex. Citizens*, 336 S.W.3d at 622. Among its grounds of protest, Texas Citizens argued that the well would not serve the "public interest" because the large trucks used to move waste to the well would damage local roads and endanger residents using the roads. *Id.* Instead of rebutting the safety-related evidence, Pioneer contended that production of natural gas is in the public interest. *Id.*

The Commission agreed with Pioneer that the production of natural gas was in the public interest, rejecting Texas Citizens' road safety argument on the grounds that the Commission "does not have jurisdiction to regulate truck traffic on the state's roads and highways." *Id.* at 622-23. Texas Citizens failed in its appeal to the Travis County District Court, but prevailed before the Third Court of Appeals, which held the Commission interpreted "the 'public interest' too narrowly by solely focusing on the well's effect on the conservation of natural resources." *Id.* at 623 (citing *Texas Citizens for a Safe Future & Clean Water v. Railroad Comm'n*, 254 S.W.3d 492, 503 (Tex. App.—Austin 2007), *rev'd* 336 S.W.3d 619 (Tex. 2011)). According to the court of appeals, the Commission must use a broader definition of "public interest," which includes public-safety concerns. *Tex. Citizens v. RRC,* 254 S.W.3d at 502. Both the Commission and Pioneer petitioned the Texas Supreme Court for review of the "public interest issue." *RRC v. Tex. Citizens*, 336 S.W.3d at 623.

The Texas Supreme Court framed the issue as one of statutory construction and the level of deference courts must afford agency interpretations. *Id.* The Commission was tasked with deciding whether "public interest" (as used in Tex. Water Code § 27.051) is a broad term, including anything affecting the public, or a more narrow term, limited to oil and gas production. *Id.* at 624. In concluding that a more narrow

interpretation was appropriate, the Court applied a "serious consideration" standard in determining the level of deference it would give to the Commission's interpretation. Under that standard, the Court concluded that it was appropriate to defer to an agency's interpretation of an ambiguous statute provided the construction "is reasonable and does not contradict the plain language of the statute." *RRC v. Tex. Citizens*, 336 S.W.3d at 625 (citing *First Am. Title Ins. Co. v. Combs*, 258 S.W.3d 627, 632 (Tex. 2008)). An agency's construction does not have to be the only, or the best, interpretation to warrant deference. *Id.* at 628. The Court made it clear that this standard is very similar but not identical to the federal *Chevron* model for agency deference. *Id.* at 625 (citing *Chevron U.S.A. v. Nat'l Res. Def. Council, Inc.*, 467 U.S. 837 (1984)).

As a preliminary matter, the Court noted that "public interest," as used in § 27.051(b)(1), is not statutorily defined and thus ambiguous. *Id.* The court then examined Texas Water Code Chapter 27 to determine the reasonableness of the Commission's interpretation, observing that Chapter 27 requires the Texas Commission on Environmental Quality (TCEQ) to consider traffic-related matters when permitting hazardous (non-oil and gas) waste injection wells, whereas the Commission's statutory authority is silent on that subject. *Id.* The court also found that the principle of *ejusdem generis* requires it to read the term "public interest" in light of the other matters the Commission was required to consider, which exclusively concerned oil and gas production. *Id.* at 629. Since the surrounding statutory scheme never mentioned traffic safety, the Court concluded that the Commission reasonably declined to consider it in weighing public interest. *Id.* The court further observed that Chapter 27's stated purpose to "maintain the quality of fresh water to the extent consistent with the public health and welfare and the operation of existing industries" was consistent with the Commission's interpretation. *RRC v. Tex. Citizens*, 336 S.W.3d at 629 (citing TEX. WATER CODE § 27.003). On the foregoing bases, the court found the Commission's interpretation "was reasonable and in accord with the plain meaning of the statute." *Id.* at 633.

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PUBLICATIONS

DOUGLAS GOINS & THOMAS O. BEAN, *RETHINKING ENVIRONMENTAL CLEANUP STRATEGIES: WHEN ONE POTENTIALLY REASONABLE PARTY IS IN BANKRUPTCY*, 29 ASS'N OF CORP. COUNS. DOCKET 28 (MARCH 2011).

Historically, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9607(a), Potentially Responsible Parties (PRPs) have been held jointly and severally liable for all cleanup costs at a hazardous

waste site. However, after the United States Supreme Court decision in *Burlington Northern v. United States*, apportionment of liability among PRPs is now permitted if there is "a reasonable basis for doing so." *Id.* at 30 (citing *Burlington N. v. U.S.*, 129 S. Ct. 1870, 1881 (2009)). In *Rethinking Environmental Cleanup Strategies*, Goins and Bean evaluate the difficulties of recovering cleanup costs when a Potentially Responsible Party (PRP) is in bankruptcy. 29 ASS'N OF CORP. COUNS. DOCKET 28 (March 2011). The article discusses the developments after *Burlington Northern* and identifies new strategies to reduce the likelihood that a PRP will be held liable for more than its allocable share of the cleanup costs. *Id.*

Goins and Bean recognize that CERCLA does not expressly state that PRP liability is joint and several, but courts have applied apportionment principles from § 433(a) of the Second Restatement of Torts to multiple PRPs, holding them jointly and severally liable under a 42 U.S.C. § 107(a) claim. *Id.* Typically, if a PRP at a contaminated site declares bankruptcy, any other PRPs have two options: (1) file a proof of claim for contribution from the bankrupt PRP or (2) file a reimbursement claim after the creditor PRP has incurred cleanup costs. *Id.* Bankrupt PRPs will generally object to claims for contribution under 11 U.S.C. § 502(e)(1)(B), in which a proof of claim is disallowed "if it is one for reimbursement or contribution." *Id.* (quoting 11 U.S.C. § 502(e)(1)(B) (2006)). Filing a reimbursement claim after incurring cleanup costs is not disallowed under 11 U.S.C. § 502(e)(1)(B), but recovering from a debtor PRP has typically resulted in the creditor PRP recovering only "pennies on the cleanup dollar." Bean & Goins, *supra*, at 30.

Bean and Goins note that *Burlington Northern* provides some hope for creditor PRPs to apportion liability and avoid the time-consuming and costly process of recovering from debtor PRPs. *Id.* In *Burlington Northern*, the 9th Circuit held two railroad companies jointly and severally liable for cleanup costs at a contaminated site. *Burlington N.*, 129 S. Ct. at 1881. The Supreme Court reversed and adopted a more expansive view of § 433A of the Restatement of Torts, holding that "apportionment is proper when 'there is a reasonable basis for determining the contribution of each cause to a single harm.'" *Id.* (quoting RESTATEMENT (SECOND) OF TORTS § 433(A)(1)(B) p. 434 (1963-64)). When looking at potential ways to apportion liability, the Court evaluated the size of the portion of land occupied by the defendant, the length of time the defendant occupied the land, and the volume of hazardous products released onto the property. *Id.* However, the Supreme Court noted that when harms are not capable of apportionment, liability is still joint and several. *Id.*

Identifying the strategic implications of *Burlington Northern*, Goins and Bean provide two strategies for creditor PRPs involved in an environmental case where liability may be apportioned. Bean & Goins, *supra*, at 33. First, they suggest that creditor PRPs should no longer be focused on recovering costs from the debtor PRP. *Id.* Instead, they should focus attention on obtaining a judicial declaration of the proportionate share of the debtor's liability. *Id.* Second, they suggest that creditor PRPs ensure they are only reimbursed from the debtor PRP if they pay more than their allocable share. *Id.* To illustrate, the authors use the example of a creditor PRP who spent $5 million to clean up its 50-percent share of the liability for a site with a $10-million cleanup cost. *Id.* The creditor PRP wants to ensure it only pays for its allocable share and not for the debtor's share, so the creditor wants the government to recognize it has spent money and satisfied its share of the cleanup. Apportioning liability so that the PRP is only

responsible for its share of the liability is also beneficial to a debtor PRP who is reorganizing and to the purchaser of contaminated property, who will want to ensure he is only responsible for the debtor's share of liability. Bean & Goins, *supra*, at 33.

In addition, Goins and Bean evaluate the practical implications of *Burlington Northern* by analyzing the procedural options for a PRP involved in an environmental cleanup case with a debtor PRP. First, the authors suggest that a creditor PRP who only has a contribution claim may want to take the unusual step of not filing a proof of claim against the debtor. *Id.* at 34. The authors point out that a creditor may follow this route if its response costs are less than its allocable share or if it is likely the claim will be disallowed under 11 U.S.C. § 502(e)(1)(B). *Id.* Another option is to file a "protective" proof of claim that maintains the creditor's share of liability as separate from the debtor's. Goins & Bean, *supra*, at 34. In that case, the creditor does not believe it has a claim against the debtor. *Id.* If the court decides not to apportion liability after a protective proof of claim is filed, the creditor has a claim against the debtor. *Id.* at 34.

The authors note that the difficulty for creditor PRPs is obtaining an apportionment order from a bankruptcy court that binds the government against the debtor PRP and the other non-debtor PRPs. *Id.*. Obtaining a court-approved settlement that apportions liability between PRPs, or obtaining an order that determines the debtor's percentage of contamination would likely bind government units if they had proper notice of settlement. *Id.* Alternatively, resolution of individual proofs of claim between debtor PRPs and creditor PRPs would likely bind only those two parties. *Id.*

Burns and Goins also suggest that another option for obtaining a binding agreement on all parties is to seek declaratory relief under 42 U.S.C. § 113(g)(2). *Id.* at 38. Under § 113(g)(2), a PRP who incurs response costs may file a declaratory judgment under 42 U.S.C. § 107(a) seeking apportionment of liability. 42 U.S.C. § 9613(g)(2) (2006). Section 113(g)(2) states, "[i]n any such action described in this subsection, the court shall enter a declaratory judgment on liability for response costs or damages that will be binding on any subsequent action or actions to recover further response costs or damages." *Id.* Several circuit courts have construed this provision to apportion liability among PRPs; the resulting declaratory judgments are likely to be binding on the parties involved. Bean & Goins, *supra*, at 38 (citing *NY v. Green*, 420 F.3d 99, 111 (2nd Cir. 2005); *Kelley v. E.I. DuPont de Nemours & Co.*, 17 F.3d 836, 844 (6th Cir. 1994)).

In response to a § 113(g)(2) action, the authors point out that the government may contest the court's jurisdiction under 42 U.S.C. § 113(h). *Id.* Under §113(h), federal courts do not have jurisdiction under federal law to "review any challenges to removal or remedial action" under 42 U.S.C. §§ 104 or 106(a), except under five circumstances. 42 U.S.C. § 9613(h)(1) (2006). Under 42 U.S.C. § 107, one circumstance is to '"recover response costs or damages for contribution."' *Id.* The 8th Circuit held that when the government files a proof of claim in a bankruptcy case to recover costs under CERCLA, this constitutes an exception to the jurisdictional bar. Bean & Goins, *supra*, at 39 (citing *U.S. v. Gurley*, 434 F.3d 1064, 1069 (8th Cir. 2006)). Thus, if the government files a proof of claim, it essentially waives its § 113(h) objection. *Id.*

When purchasing contaminated property, buyers have attempted to include orders confirming that title is free and that they are not subject to environmental liabilities on the existing property. *Id.* Though the government will likely object to a provision excluding liability, the debtor may obtain a declaration defining its proportionate share of the liability to limit cleanup costs. *Id.* at 39-40. Additionally, the Seventh Cir-

cuit has held the government does not have a claim dischargeable in bankruptcy under certain environmental statutes, such as the Resource Conservation and Recovery Act (RCRA), which only provides the government with injunctive—as opposed to monetary—relief. *Id.* at 40 (citing *U.S. v. Apex Oil Co., Inc.*, 579 F.3d 734 (7th Cir. 2009)). Because the claim was not dischargeable in the bankruptcy proceeding, the debtor could be held liable for cleanup obligations after bankruptcy. *Id.* For the authors, this possibility for liability highlights the importance of obtaining an order that apportions liability for the debtor PRP. Bean & Goins, *supra*, at 40.

Goins and Bean provide options for both creditor and debtor PRPs to better position themselves in navigating environmental cleanups; specifically, the authors suggest PRPs abandon traditional joint and several liability when possible and apportion their respective liabilities instead.

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Washington Update

EPA Studying Hydraulic Fracturing Impacts

In the past several years, hydraulic fracturing ("fracking") has become a central issue for environmental regulators. Fracking is a method of natural gas recovery that injects pressurized water, propping agents, and chemical solutions into subsurface formations such as shale rock, tight sands, and other "unconventional" reservoirs to fracture the formation, thereby releasing the natural gas trapped therein. U.S. Envtl. Prot. Agency, *Draft Plan to Study the Impacts of Hydraulic Fracturing on Drinking Water Resources*, at vii (Feb. 7, 2011), *available at* http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/HFStudyPlanDraft_SAB_020711-08.pdf [hereinafter *Draft Study Plan*]. Although fracking is an important technique in the natural gas industry, it may also pose a public health risk by jeopardizing nearby drinking water sources and ambient air quality. *Id.* at viii. Currently, the Environmental Protection Agency (EPA) is studying the potential impacts of fracking on drinking water and air quality. U.S. Envtl. Prot. Agency, *Hydraulic Fracturing*, http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/index.cfm (last updated Aug. 25, 2011) [hereinafter *Hydraulic Fracturing*]. In addition, EPA is developing guidance on the use of diesel fuels in hydraulic fracturing. *Id.*

Drinking Water

In response to concerns about fracking and its impact on drinking water, EPA has initiated a multi-year study of fracking's impact on drinking water. *Id.* The study will examine water use in fracking and the potential impacts of fracking on drinking water through a lifecycle analysis. In doing so, EPA will assess the impacts of water acquisi-

tion, chemical mixing, injection and fracturing, recovery of produced water and flowback, and final treatment and disposal of wastewater. *Id.*

EPA's *Draft Study Plan* contemplates the use of two prospective and five retrospective case studies. *Draft Study Plan, supra,* at vii. At the two prospective case study locations, EPA will monitor water use and drinking water impacts at sites where hydraulic fracturing will begin after the study is initiated. *Id.* Meanwhile, the five retrospective case studies will examine reports of drinking water contamination associated with previous fracking activities. *Id.* At each retrospective study location, EPA has identified issues to be investigated, such as suspected drinking water well contamination or surface water contamination from a fracking chemical spill, as well as the potential outcomes of the investigation. U.S. Envtl. Prot. Agency, *Case Study Locations for Hydraulic Fracturing*, http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/case_studies.cfm (last updated Jun. 23, 2011).

After responding to the comments of its Science Advisory Board on the Draft Study Plan, EPA will begin its study, with the goal of providing initial results by the end of 2012 and a full report in 2014. *Hydraulic Fracturing, supra*. Further information on EPA's study, including links to relevant documents, is available on the EPA's website. *Id.*

AIR QUALITY

On July 28, 2011, EPA proposed a suite of air emissions standards for the oil and natural gas industries, including new regulations aimed at controlling air emissions of volatile organic compounds (VOCs) and methane from hydraulic fracturing. Oil and Natural Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews, 76 Fed. Reg. 52738, 52798 (Aug. 23, 2011). Under current regulations, hydraulic fracturing activities are not subject to new source performance standards (NSPS) for VOCs. U.S. Envtl. Prot. Agency, *Proposed Amendments to Air Regulations for the Oil and Gas Industry, Fact Sheet*, http://www.epa.gov/airquality/oilandgas/pdfs/20110728factsheet.pdf, (last updated Aug. 25, 2011) [hereinafter *Fact Sheet*]. However, after a lawsuit between EPA and environmental groups, the Agency entered into a consent decree that required the development of new air regulations for the oil and gas industry. Oil and Natural Gas Sector -Notice of Public Meeting, 75 Fed. Reg. 39934, 33935 (Jul. 13, 2010).

For certain types of new or refractured natural gas wells—specifically, non-exploratory and non-delineation wells—EPA's proposed rules would require that the wells be finished by "green completion." Oil and Natural Gas Sector: New Source Performance Standards for Hazardous Air Pollutants Reviews, 76 Fed. Reg. 52738, 52746 (Aug. 23, 2011). "Green completion" or "reduced emissions completion" is a process that uses specialized equipment to separate the gas and liquid components of flowback, allowing each to be captured, treated and sold separately. *Fact Sheet, supra.* By capturing flowback gases, green completion prevents VOCs, methane, and other volatiles from venting directly to the environment. *Id.* EPA estimates that green completions could reduce emissions from new and refractured wells by 95%. *Id.*

For exploratory and delineation wells, however, which are generally not near a gathering line, it is not practical to capture flowback gasses through green completion. 76 Fed. Reg. at 52745. To reduce emissions from those wells, the proposed rules would require pit flaring, unless flaring presents a safety concern. *Id.*; *Fact Sheet, supra.*

EPA estimates that each year over 20,000 hydraulically fractured completions and recompletions will be subject to the requirements outlined by the proposed rules. 76 Fed. Reg. at 52747. As such, the proposed regulations would establish new notification and reporting procedures as described in the General Provisions and Subpart OOOO of 40 C.F.R. Part 60. *Id.*

EPA sought public comments on its proposed rules until October 24, 2011. *Id.* at 52738. Public hearings were also scheduled for this fall in Dallas, Texas; Pittsburg, Pennsylvania; and Denver, Colorado. *Id.* However, on September 2, 2011, President Obama asked EPA Administrator Lisa Jackson to withdraw the proposed rules, with a planned reconsideration scheduled for 2013. The White House, Office of the Press Secretary, *Statement by the President on the Ozone National Ambient Air Quality Standards* (Sept. 2, 2011), http://www.whitehouse.gov/the-press-office/2011/09/02/statement-president-ozone-national-ambient-air-quality-standards.

Diesel Fuel

EPA is currently developing regulatory guidance pursuant to the underground injection control (UIC) program to address the underground injection and disposal of fracking fluids containing diesel fuels. Diesel fuels are sometimes added to hydraulic fracturing fluids "as viscosifers and as solvents to aid in the delivery of gelling agents." U.S. Envtl. Prot. Agency, *EPA's Approach to Permitting Guidance for Oil and Gas Hydraulic Fracturing Activities Using Diesel Fuels, Public Webinar*, 12 (Jun. 15, 2011), http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/Diesel-Guidance-Webinar-All-presentations-6-15-11-1-_508-Compliant.pdf [hereinafter *Webinar*]. However, diesel fuel in the subsurface may also pose a risk to underground sources of drinking water. *Id.*

Under the UIC program, injection wells related to oil and gas production generally must receive a Class II permit from EPA or the state agency implementing the UIC. *See* 40 C.F.R. § 144.1(g) (2011). The permit verifies that the injection well has been completed in such a way as to be protective of underground drinking water sources. *See id.* § 146.22. However, the Class II permitting requirement does not generally apply to injection wells associated with hydraulic fracturing. Specifically, the Safe Drinking Water Act (SDWA), which is the primary means by which EPA protects underground drinking water, was amended in 2005 to exclude "the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing" from the general definition of "underground injection." 42 U.S.C. § 300h(d) (2011). Thus, only those injection wells that are related to hydraulic fracturing for oil or gas and use diesel fuel are subject to the UIC Class II injection well requirements. *See id.* However, EPA retains emergency authority under the SDWA to address an "imminent and substantial endangerment to health" from contaminated drinking water. *Id.* § 300i(a).

During the spring and summer of 2011, EPA held several public meetings and webinars, seeking input from stakeholders, technical experts, and interest groups on the subject of UIC permits for hydraulic fracturing activities that use diesel fuels. U.S. Envtl. Prot. Agency, *Underground Injection Control Guidance for Permitting Oil and Natural Gas Hydraulic Fracturing Activities Using Diesel Fuels*, http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/wells_hydroout.cfm#diesel (last updated Aug. 22, 2011). Among other topics, EPA solicited public input on the following: the definition of "diesel fuels," appropriate UIC permit durations for fracking activities that

use diesel fuels; monitoring and reporting requirements for fracked wells, additional information to be submitted with a new Class II permit application, and the ways in which the Class II UIC permit process could be modified or expanded to address concerns about hydraulic fracturing using diesel fuels. U.S. Envtl. Prot. Agency, *EPA Public Stakeholders Webinar on Hydraulic Fracturing Using Diesel Fuels, Meeting Summary*, 1 (Jul. 15, 2011), http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/June-15-HF-Public-Webinar.pdf.

The final public comment period is scheduled for Fall 2011, subsequent to which EPA will issue its final guidance. *Webinar, supra,* at 6.

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