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Responsible Environmental Behavior, Energy Conservation, and Compact Fluorescent Bulbs: You Can Lead a Horse to Water, But Can You Make It Drink?

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RESPONSIBLE ENVIRONMENTAL BEHAVIOR, ENERGY CONSERVATION, AND COMPACT FLUORESCENT BULBS: YOU CAN LEAD A HORSE TO WATER, BUT CAN YOU MAKE IT DRINK?

*Hope M. Babcock**

I. INTRODUCTION

Despite professing to care about the environment and supporting environmental causes, individuals behave in environmentally irresponsible ways like driving when they can take public transportation, littering, or disposing of toxic materials in unsound ways. This is my fourth exploration of how to encourage individuals to stop behaving irresponsibly about the environment they allege to care deeply about. The prior three articles all explored how the norm of environmental protection could be enlisted in this effort; this Article applies those theoretical conclusions to the very practical task of getting people to switch the type of light bulb they use and thus adhere to the concrete norm of energy conservation.

To help situate this piece better in my prior work, the first article proposed expanding the abstract environmental protection norm to include individual environmental responsibility as the approach most likely to overcome barriers to behavioral change.¹ That article recommended enlisting environmental groups as the most effective “norm entrepreneurs” to achieve widespread change in personal environmental conduct.² The piece concluded that the best way to change norms and thus change behavior is through education, but that

* Professor of Law Georgetown University Law Center. The ideas in this Article were first presented in abbreviated form at the Symposium on Energy and the Environment at Hofstra University School of Law, where I received helpful comments from members of the panel and the audience. I am indebted to my research assistant, Angela Navarro, for her careful editing and to my colleague at Institute for Public Representation at Georgetown, Jamie Pleune, for her substantive comments on this Article.

1. See Hope M. Babcock, *Global Climate Change: A Civic Republican Moment for Achieving Broader Changes in Environmental Behavior*, 26 PACE ENVTL. L. REV. 1, 3 (2009).

2. *Id.* at 14, 17; Cass R. Sunstein, *Social Norms and Social Roles*, 96 COLUM. L. REV. 903, 909 (1996) (defining “norm entrepreneurs” as “people interested in changing social norms”). When successful, norm entrepreneurs produce “norm bandwagons,” which are created when small changes in behavior result in large ones, and “norm cascades,” which happen when there are “rapid shifts in norms.” *Id.*

additional measures might be necessary.³

The second article expanded on the earlier discussion of norms and their influence on behavior, and why changing norms, though difficult, is more effective than other means of inciting behavioral change.⁴ However, given the difficulty inherent in creating or changing norms, the second article also identified and evaluated several norm- and behavior-changing tactics, such as shaming, public education, and market-based incentives.⁵ That article concluded that no single tactic is sufficient to secure both norm and behavior change, but that a combination of any or all of them when properly tailored to the source and nature of the harm and when accompanied by public education can lead to both norm and behavioral change.⁶

The third piece examined how republican theory supports the critical role of public education in informing and changing norms and provides the theoretical framework within which norm and behavior change can occur.⁷ All three pieces use as a starting premise the theory that the current crisis over global climate change has created the circumstances in which norm change can occur—circumstances that collectively have created what I call a second environmental republican moment.⁸ It is during republican moments that individuals are most amenable to learning about their responsibilities as citizens.⁹

This fourth Article synthesizes the previous articles into an assumption about the critical role of norms in changing personal behavior and tests that assumption by exploring how to make individuals more responsible consumers of electricity and adhere to the concrete norm of energy conservation¹⁰ by swapping out their incandescent light bulbs for compact fluorescent lights (“CFLs”).¹¹ The agreed upon goal

3. Babcock, *supra* note 1, at 17.

4. Hope M. Babcock, *Assuming Personal Responsibility for Improving the Environment: Moving Toward a New Environmental Norm*, 33 HARV. ENVTL. L. REV. 117, 118 (2009).

5. *Id.* at 159, 165.

6. *Id.* at 174.

7. Hope M. Babcock, *Civic Republicanism Provides Theoretical Support for Making Individuals More Environmentally Responsible*, 23 NOTRE DAME J.L. ETHICS & PUB. POL’Y 515, 516 (2009).

8. The first occurred during the 1960s and 1970s and culminated in Earth Day. See Daniel A. Farber, *Politics and Procedure in Environmental Law*, 8 J.L. ECON. & ORG. 59, 66 (1992) (calling 1970 Earth Day, involving participation of twenty million people in various public events, a “republican moment”).

9. *Id.*

10. See Babcock, *supra* note 4, at 137 (discussing concrete norms).

11. The importance of reducing demand for electricity is captured by Chairman Alan Schriber of the Public Utilities Commission of Ohio when he said, “You can build wind generators and solar panels. All that’s nice, but at the end of the day, reducing consumption is the cheapest way to do it By decreasing demand, you forgo the need to continually build [power plants].” Peter Slevin

behind energy conservation is to reduce the country's reliance on fossil fuel-based energy production, thus reducing the emission of harmful airborne pollutants and greenhouse gases as well as the related environmental harms associated with coal production.¹² One way to reduce residential energy consumption is to persuade individuals to switch to CFLs.¹³ Up to ninety percent of energy produced by incandescent bulbs is lost as heat; switching to CFLs is one way to prevent this energy loss.¹⁴

However, getting individuals to switch bulbs is not as easy as one might think because of various barriers that stand in the way of changing environmental behavior.¹⁵ Some of these obstacles are unique to CFLs; others are more generic. This Article identifies and evaluates the likelihood of success of two fairly new utility-sponsored initiatives that are designed to reduce residential energy consumption. This Article also identifies one more broadly designed initiative to change personal behavior—to see whether the underlying behavioral motivators in each of these initiatives could get individuals to swap out their traditional light bulbs for energy saving CFLs.¹⁶

& Steven Mufson, *Stimulus Dollars Energize Efforts to Smarten Up the Electric Power Grid*, WASH. POST, Mar. 10, 2009, at A1.

12. President Obama has made clean energy a centerpiece of his new Administration, part of which entails reducing the country's dependence on fossil fuels. See Editorial, *Mr. Obama's Energy Future*, N.Y. TIMES, Feb. 26, 2009, at A30.

13. See *infra* notes 38-47 and accompanying text (discussing the effectiveness of CFLs).

14. Energy Info. Admin., U.S. Household Electricity Report, http://eia.doe.gov/emeu/reps/enduse/er01_us.html (last visited Oct. 20, 2009). The European Commission recently adopted regulations that will phase out incandescent light bulbs during the next three years and call for the use of more energy-efficient alternatives, such as CFLs, to “deliver a clear message about the EU's commitment to reach its energy efficiency and climate protection targets.” James Murray, *EU Declares an End to Inefficient Bulbs*, BUSINESSGREEN, Mar. 18, 2009, <http://www.businessgreen.com/2238713> (quoting the European Energy Commissioner, Andris Piebalgs).

15. See Ann E. Carlson, *Recycling Norms*, 89 CAL. L. REV. 1231, 1243 (2001).

16. This Article does not consider the approach of external sanctions, such as fines for exceeding preset levels of energy use, because of the difficulties that implementing these sanctions would entail, including the potential for political backlash and the invasion of privacy by the government to acquire information about consumer behavior from the utilities as well as the high monitoring and enforcement costs of implementing such a program. See *id.* at 1235 (“When numerous people must act to solve a collective problem and lack the economic incentive to do so, traditional government regulation, such as formal law, may be infeasible, ineffectual, or politically difficult. The costs of monitoring and enforcement can be prohibitively expensive or may raise privacy concerns. Many environmental problems are illustrative[, such as] . . . carpooling, stormwater pollution prevention, [and] energy conservation.”); Lior Jacob Strahilevitz, *How Changes in Property Regimes Influence Social Norms: Commodifying California's Carpool Lanes*, 75 IND. L.J. 1231, 1276 (2000). (“Heavy handed mechanisms—such as large tolls charged to all solo commuters, or public campaigns labeling solo commuters as environmental criminals—would certainly spur a backlash.”); Michael P. Vandenbergh, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Law*, 57 VAND. L. REV. 515, 520 (2004)

Somewhat to my surprise, and perhaps to the surprise of anyone who has read my previous work in this area, this Article reaches the conclusion that the perceived problems with CFLs are sufficiently severe that no amount of persuasion will induce individuals to acquire them, despite their individual and social benefits. Rather, structural—what Professor Ann Carlson calls “architectural”¹⁷—changes need to be made to CFLs to eliminate their negative features and to make their acquisition and disposal easier before the motivational tools identified in the three initiatives can have any effect on consumers.

In support of this conclusion, the first Part of this Article provides some background information on residential electricity consumption to show why reducing the amount of consumption in this sector is important and how substituting a single CFL for a traditional incandescent bulb can contribute to this result. The second Part identifies various barriers that stand in the way of consumers swapping out light bulbs, particularly hurdles that are unique to CFLs. The third Part of the Article describes three different approaches to reducing residential energy use—smart meters, comparative consumer information, and personal incentives. This Part identifies the dominant persuasive technique employed in each of the three approaches. It then evaluates the effectiveness of these techniques at overcoming barriers to behavioral change based upon what is known about their use in other contexts where behavior change was sought.

The final section of this Article pulls together the results of the previous sections to determine if any motivational technique, alone or in combination, might induce individuals to adhere to the norm of energy conservation by purchasing CFLs. Answering this question in the negative, this Article concludes that behavioral change in this context will not occur without reducing the structural barriers that stand in the way, relegating both persuasive techniques and norm-induced behavioral change to a secondary, albeit still important role.

[hereinafter Vandenberg, *From Smokestack to SUV*] (arguing that when regulators have tried “to impose restrictions on individual behavior[,] . . . the restrictions have been unpopular and have provoked a public backlash”); Michael P. Vandenberg, *Beyond Elegance: A Testable Typology of Social Norms in Corporate Environmental Compliance*, 22 STAN. ENVTL. L.J. 55, 101 (2003) [hereinafter Vandenberg, *Beyond Elegance*] (“[T]he greater the perceived importance of autonomy, the less likely the individual will respond to threats of formal legal sanctions by increasing compliance. Instead, when the freedom to conduct an activity is very important, individuals may react to increased threats to restrict that freedom by simply increasing their commitment to the illegal activity.”).

17. Carlson, *supra* note 15, at 1265 (suggesting indirect ways of encouraging environmentally positive behavior by the use of “[a]rchitectural [m]echanisms” that “facilitate” good environmental behavior).

II. BACKGROUND INFORMATION ON RESIDENTIAL ENERGY USE AND THE POTENTIAL CONTRIBUTION OF CFLS TO DECREASING THAT USE

Americans consume a lot of electricity, and projections show that they will continue to consume more rather than less.¹⁸ The most common source of electricity continues to be coal-fired plants,¹⁹ which emit pollutants like particulate matter, sulfur dioxide, and mercury, as well as greenhouse gases.²⁰

In 2001, electricity consumption in the United States totaled 1140 billion kilowatt-hours.²¹ Since the late 1970s, retail sales of electricity to U.S. households have exceeded sales to the commercial and industry sectors.²² In 2003, retail sales of electricity to the residential sector totaled 1.3 trillion kilowatt-hours.²³ The growth in the residential sector's share of overall electricity consumption is due to population growth as well as increasing ownership and electrification of single family households.²⁴

Electrification of homes and construction of new homes contribute to this change.²⁵ The largest end uses of electricity in U.S. households in 2001 were central air-conditioning and refrigerators, each accounting for about fourteen percent of the total residential energy consumed.²⁶ The

18. Recognizing the need to decrease the nation's reliance on fossil fuel and improve energy efficiency, over \$20 billion included in the stimulus package was earmarked for improving the efficiency of government buildings and the homes of the poor. Kate Galbraith, *Bright Lights, Big Budget: Nation Prepares for a Flood of Spending on Energy Efficiency*, N.Y. TIMES, Feb. 26, 2009, at B1.

19. According to the Energy Information Administration, 49.6% of the electricity generated in 2005 was fueled by coal; for the last twelve months of record (through December 2008), this number dropped slightly to 48.5%. See ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, ELECTRIC POWER MONTHLY 13 (2009), <http://www.eia.doe.gov/cneaf/electricity/epm/epm.pdf>.

20. According to the Environmental Protection Agency ("EPA"), the 2005 National Average Emissions Rate for carbon dioxide, the most common greenhouse gas, from residential electricity was 1329 pounds of carbon dioxide per megawatt-hour. EPA, EGRID2007 VERSION 1.1: YEAR 2005 SUMMARY TABLES 1 (2008), http://www.epa.gov/cleanenergy/documents/eGRID2007V1_1_year05_SummaryTables.pdf. Google calculates that based on an average of 7.5 tonnes of carbon dioxide emitted per year per household and 4.5 tonnes of carbon dioxide emitted per year per conventional car, an energy savings of ten percent for six households would reduce carbon emission by about the same amount as taking one conventional car off the road. Google.org, Google PowerMeter Data Sources, <http://www.google.org/powermeter/calculation.html>.

21. Energy Info. Admin., *supra* note 14.

22. *Id.*

23. *Id.*

24. *Id.*

25. *Id.*

26. *Id.* While federal and state efficiency standards have improved the energy consumption of major appliances like air conditioning systems and refrigerators, turnover in those appliances is extremely slow. This means that their effect on the total amount of energy consumed per household per annum is less than what one might otherwise think. However, newer, more efficient refrigerators and freezers can, to some extent, offset the effect of higher energy consumption from the purchase

number of households with central air-conditioning rose from twenty-seven percent in 1980 to fifty-five percent in 2001, in part due to the construction of new homes in the southern part of the country.²⁷ The 106 million households with color TVs accounted for thirty-three billion kilowatt-hours and comprised the largest single home electronics use that year—VCRs/DVDs, cable boxes, and satellite dishes added sixteen billion kilowatt-hours to the total.²⁸ Sixty million households had personal computers, fifty-one million of which had Internet access as well as printers, accounting for a combined twenty-three billion kilowatt-hours.²⁹ According to the Energy Information Administration (“EIA”), over the next twenty years, the demand for electricity to power household appliances and home electronics, particularly color TVs and computer equipment, is projected to increase rapidly.³⁰

Although lighting accounted for only 8.8 percent of U.S. household electricity use in 2001,³¹ it is one area in which a significant decrease in residential electricity consumption can be made.³² However, although an obvious way to reduce the level of residential electricity use is to get individuals to turn off their lights when not in use, this is difficult to do because of personal habits, which arise from “[r]epeated interactions,”³³ and which are a major determinant of individual behavior.³⁴ It is also

of more powerful home office equipment, more extensive home entertainment systems, or additional kitchen appliances. *Id.*

27. *Id.*

28. *Id.*

29. *Id.*

30. *Id.* The EIA projects electricity consumption for color TVs and computers will grow 3.5 percent annually through 2025 to more than double the level of consumption of those home electronics in 2003. *Id.*

31. *Id.*; see also Walmart Fact Sheets, <http://walmartstores.com/FactsNews/FactSheets/> (under “Topics” follow “Sustainability”; then follow “Compact Fluorescent Light Bulbs Fact Sheet” hyperlink) (attributing “nearly 20 percent of all home electric costs in the U. S.” to lighting).

32. The other obvious area is to have people turn off electric lights when they are not in use. The barriers to doing this are discussed later in this Article as part of the justification of focusing on swapping out incandescent bulbs for CFLs. See *infra* notes 51-58 and accompanying text.

33. David R. Karp, *The New Debate About Shame in Criminal Justice: An Interactionist Account*, 21 JUST. SYS. J. 301, 313 (2000) (arguing that habits “become expectations in the sense of predictions or anticipations of [individual] behavior,” which pressure individuals to meet those expectations “partly out of a feeling that the other will be irritated, offended, or disappointed if the expectation is not fulfilled” (quoting DENNIS H. WRONG, *THE PROBLEM OF ORDER: WHAT UNITES AND DIVIDES SOCIETY* 48 (1994))).

34. See Vandenberg, *From Smokestack to SUV*, *supra* note 16, at 594-95. Because habits circumvent decisional processes, they save cognitive time and energy and “habits tend to truncate the traditional subjective expected utility calculation by creating a ‘habitual mindset.’ . . . Strong habits also may impede the influence of personal norms.” *Id.*; see also Michael P. Vandenberg, *Order Without Social Norms: How Personal Norm Activation Can Protect the Environment*, 99 NW. U. L. REV. 1101, 1165 (2005) (stating that “many behavior changes that would generate a large payoff for the individual are blocked by habits or other psychological barriers”). Habits play a

extremely difficult to get people to refrain from consuming products that improve the quality of their lives,³⁵ even if they depend on high levels of electricity, like plasma TVs or digital picture frames.³⁶ These problems are one reason that attention has focused on increasing the use of CFLs.³⁷

Incandescent light bulbs, which are found in most households, are extremely inefficient sources of light because about ninety percent of the energy used by them is lost as heat.³⁸ CFLs use between one fifth and one third less power than equivalent incandescent lamps, generate significantly less heat, and last up to ten times longer.³⁹ If every one of the 110 million households in the United States replaced a conventional sixty-watt incandescent bulb with one CFL, the energy saved by that small action would be enough to power a city of 1.5 million people.⁴⁰ One swapped-out bulb per house could power all the homes in Delaware and Rhode Island.⁴¹ In terms of greenhouse gases not emitted into the

greater role in maintaining behaviors, such as leaving lights or the computer on, than in making a single investment, for example by changing a light bulb. See Stephanie Stern, *Encouraging Conservation on Private Lands: A Behavioral Analysis of Financial Incentives*, 48 ARIZ. L. REV. 541, 561-62 (2006) (stating that people “prefer to invest in new technology, such as the purchase of energy-efficient appliances, rather than change their daily behaviors and habits” because they see these investments as improving the quality of their lives, while behavioral change “is often experienced as a deprivation”). Habits are even harder to overcome if the new behavior is inconvenient, requires significant effort, or is costly, like restarting the computer or turning on the lights every time a room is reentered. Carlson, *supra* note 15, at 1236.

35. Holly Doremus, *Biodiversity and the Challenge of Saving the Ordinary*, 38 IDAHO L. REV. 325, 344-45, 351 (2002) (stating that people “are capable of self-restraint, but it does not come easily”); see also Babcock, *supra* note 4, at 122-23 (discussing the environmental problems from personal consumption); Douglas A. Kysar, *Law, Environment, and Vision*, 97 NW. U. L. REV. 675, 723 (2003) (arguing that the phenomenon of the competitive consumer who “continually trades in goods for the latest model with the latest features” because she “desires . . . to possess something that relatively few others are capable of attaining, [is] an observable symbol that signifies success under prevailing social norms”).

36. *All Things Considered: Digital Frames Have Environmental Cost* (NPR radio broadcast Feb. 16, 2009) (stating that if each family in the United States had one digital picture frame, the country would need five new power plants to keep pace with the demand for electricity).

37. An even more efficient bulb, the organic light-emitting diode (“OLED”) is under development at the Department of Energy. OLEDs will produce approximately 160 lumens of light per watt compared to traditional incandescent bulbs, which produce only five lumens per watt, and CFLs, which produce roughly fifty lumens per watt. See Jenny Mandel, *Energy Efficiency: DOE Researcher Solves Part of Lighting Riddle*, GREENWIRE, Mar. 25, 2009, <http://www.eenews.net/Greenwire/print/2009/03/25/3>.

38. Energy Info. Admin., *supra* note 14.

39. LINDA REMBOWSKI, THE DEFINITIVE ENVIRONMENTAL GUIDE TO GOING GREEN FOR GOOD 25, 57-58 (2009); Walmart Fact Sheets, *supra* note 31 (“An ENERGYSTAR-qualified CFL uses about 75 percent less energy than standard incandescent bulbs and lasts up to 10 times longer.”).

40. Charles Fishman, *How Many Lightbulbs Does it Take to Change the World?: One. And You're Looking at It*, FAST COMPANY, Sept. 2006, at 74, 76.

41. *Id.*

atmosphere, one swapped out bulb per 110 million households is equal to taking 1.3 million cars off the road and would save enough electricity to turn off two power plants permanently or avoid building the next two, assuming the demand level for electricity did not creep back up.⁴² Therefore, if every U.S. household substituted just one CFL for one incandescent bulb, the savings in electricity and resultant environmental benefits would be impressive. Just one CFL can prevent 690 pounds of greenhouse gases from being emitted into the atmosphere and 200 pounds of coal from being burned in power plants.⁴³

The typical U.S. household has between fifty and one hundred sockets.⁴⁴ Imagine if individuals switched more than one bulb. The question is how to motivate each household to swap even one incandescent bulb for a CFL.

Motivating individuals to change their light bulbs should not be difficult to do given the obvious environmental benefits of using CFLs and the public's strong acceptance of the environmental protection norm.⁴⁵ Moreover, unlike refraining from dumping waste motor oil down a drain or spreading pesticides on a lawn, which have no apparent benefit to the polluter,⁴⁶ reducing electricity use has a direct beneficial effect on the individual in the form of reduced electrical bills.⁴⁷ A direct monetary benefit to the individual can act to overcome her temptation to free-ride on the environmental good works of others and gain the

42. *Id.*; see also Energy Star, Compact Fluorescent Light Bulbs for Consumers, http://www.energystar.gov/index.cfm?c=cfls.pr_cfls (last visited Oct. 20, 2009) ("If every American home replaced just one light bulb with an ENERGY STAR qualified bulb, we would save enough energy to light more than 3 million homes for a year, more than \$600 million in annual energy costs, and prevent greenhouse gases equivalent to the emissions of more than 800,000 cars."). ENERGY STAR qualified bulbs use about seventy-five percent less energy than standard incandescent bulbs and last up to ten times longer. Energy Star, Qualified Compact Fluorescent Light Bulbs (CFLs): At a Glance, http://www.energystar.gov/ia/partners/manuf_res/salestraining_res/CFL_AtAGlance.pdf (last visited Oct. 20, 2009). They save about thirty dollars or more in electricity costs over each bulb's lifetime and produce about seventy-five percent less heat, so they are safer to operate and can cut energy costs associated with home cooling. *Id.*

43. See Walmart Fact Sheets, *supra* note 31.

44. Fishman, *supra* note 40, at 76.

45. See Vandenberg, *supra* note 34, at 1117 (stating that the "abstract norm favoring protection of human health and the environment is widely held, stable, and influential"); see also Farber, *supra* note 8, at 65.

46. See Babcock, *supra* note 4, at 142; see also Carlson, *supra* note 15, at 1242 (noting that while proper environmental behavior "produces environmental benefits[,] . . . it remains the case that these are generalized benefits to the collective not typically viewed as producing any substantial, immediate benefit at an individual level").

47. Changing the incandescent light bulbs in an average size house to CFLs can save Wal-Mart customers \$350 a year and a typical small business \$1325 a year in energy costs. Walmart, Wal-Mart Surpasses Goal to Sell 100 Million Compact Fluorescent Light Bulbs Three Months Early, <http://walmartstores.com/FactsNews/NewsRoom/6756.aspx> (last visited Oct. 20, 2009).

collective goods of an improved environment.⁴⁸ However, there are many obstacles, which are discussed in the next Part of this Article, that impede individuals from behaving in conformance with the energy conservation norm by swapping out their incandescent light bulbs.

III. BARRIERS TO CHANGING LIGHT BULBS

Despite the fact that individuals can save money and thus experience a direct benefit by switching light bulbs, it is not easy to motivate them to engage in this activity and adhere to the concrete norm of energy conservation.⁴⁹ There are many barriers that stand in the way of responsible environmental behavior that are difficult to overcome, even before individuals encounter the specific problems generated by CFLs.⁵⁰

A. Barriers to Behaving in an Environmentally Responsible Way

Habits and self interest as well as the inconvenience and cost of the new behavior and the unavailability of alternatives are examples of common barriers that must be overcome before individuals will change their behavior. In addition, the persistence of the myth that only industry is responsible for environmental harm⁵¹ and the difficulty individuals have understanding how their seemingly minor actions (changing a light bulb) can accumulate into more serious, widespread harm (polar bears drowning as the planet warms),⁵² contribute to the resistance of individuals to changing their environmental behavior.

Individuals also employ cognitive heuristics (flawed problem solving techniques) that interfere with how they process information about environmental harms. This can prevent them from acting in an

48. Carlson, *supra* note 15, at 1243 (“[If] others engage in the behavior necessary to achieve the collective good, [one] can free ride on their efforts and still gain the benefits of their behavior.”).

49. The European Union, and Germany in particular, has taken a multi-pronged approach to getting individuals to reduce the amount of energy they consume. *See generally* Thomas Daniel Wuertenber, *The Regulation of CO2 Emissions Caused by Private Households – An Analysis of the Legal Situation in the European Union and Germany*, 16 MO. ENVTL. L. & POL’Y REV. 1 (2009) (describing the various initiatives, including command and control regulations, loans, subsidies, metering, and labeling being undertaken by the European Union and Germany to regulate carbon dioxide emissions by individuals). Interestingly, the United States may be taking a step toward the European Union’s command and control model with the introduction of the Appliance Standards Improvement Act of 2009 in the Senate, one provision of which phases out the use of incandescent light bulbs in portable light fixtures. *See* Ari Natter, *Energy Efficiency: Senate Legislation on Appliance Standards Draws Fire from Energy Department*, *EPA*, 40 Env’t. Rep. (BNA) No. 13, at 679 (Mar. 27, 2009).

50. *See* Babcock, *supra* note 4, at 124-34 (discussing barriers to changing personal behavior).

51. *See id.* at 125-26.

52. *See id.* at 130-31.

environmentally benign way.⁵³ Often individuals resist changing their behavior because they disbelieve the reason for the behavior change or they question the legitimacy of the norm underlying the change.⁵⁴ There are also social norms like the autonomy and reciprocity norms that get in the way of the environmental protection norm, the compliance with law norm, and the personal responsibility norm, norms which might otherwise encourage good environmental behavior.⁵⁵

There is one other barrier to good environmental behavior that particularly impedes compliance with the energy conservation norm. Thus, to the extent individuals depend on enhancing their own self worth or earning the esteem of others to motivate good behavior, conserving energy in their homes, for example by turning off lights or changing light bulbs, means they will not receive the positive regard of their neighbors and friends because no one will observe their actions.⁵⁶ “The evidence suggests that esteem matters; many individuals care what others think of them.”⁵⁷ If external praise is not there, then it is less likely that an individual will feel proud of her good behavior and will engage in it.⁵⁸

B. Structural Problems with CFLs

There are specific structural problems with CFLs that trigger the general barriers to individuals conserving energy by changing light bulbs. Some of these problems relate to the cost of CFLs and others to

53. *Id.* at 127-29 (discussing how people overestimate their knowledge about a particular problem, make stereotypical decisions and then self-select information to support those conclusions, simplify complexities, suffer from both alarmist and optimistic biases which affect how they assess the probability of an event occurring, and generally filter out ordinary activities).

54. See Christopher A. Deabler, *The Normative and Legal Deficiencies of “Public Morality.”* 19 J.L. & POL. 23, 34-35 (2003) (“Though we may be motivated to adopt certain normative frameworks, they have to be justified cognitively to ourselves if they are to legitimately govern behavior. This framework must consist of a justification of norms generally *and* the justification of their societal implementation.”).

55. See Babcock, *supra* note 4, at 151-52 (discussing how these norms can block compliance with the environmental protection norm).

56. Carlson, *supra* note 15, at 1299-1300 (noting that “face-to-face contact and behavioral feedback” increase the opportunities to signal or gain esteem). Changing light bulbs can be contrasted with curbside recycling where the visibility of the action plays an important role in engaging in it. See *id.* at 1279 (“To the extent that garnering neighbors’ esteem or signaling one’s reputation motivates a potential recycler, visible curbside recycling is a wonderful tool Those who do not recycle are visible noncooperators.”).

57. *Id.* at 1290. “Cooperative behavior typically increases when opportunities to communicate esteem (or lack of it) increase . . .” *Id.*

58. See *id.* at 1283 (noting a positive “correlation” between the level of recycling intensity and the extent to which “an individual feels . . . proud about being environmentally responsible” (citing Daniel Scott, *Equal Opportunity, Unequal Results: Determinants of Household Recycling Intensity*, 31 ENV’T & BEHAV. 267, 284 (1999))).

inconvenience;⁵⁹ still others are uniquely associated with the product's design features.⁶⁰ While CFL technology "has improved in the last decade, the bulbs do not replicate the performance of incandescents, the bulbs to which most people are accustomed."⁶¹ These problems with CFLs can neutralize any guilt an individual may feel about not conforming to the energy conservation norm, which might otherwise propel her to switch bulbs.⁶²

For example, CFLs can be three to ten times more expensive than traditional incandescent light bulbs, which can dissuade even the most ardent adherent to the energy conservation norm from acquiring them.⁶³ It takes longer for a CFL to start up than a conventional incandescent bulb, most of them buzz, and many people find the color of the light they emit and their shape objectionable.⁶⁴ CFLs also get dimmer over time⁶⁵ and can damage textiles and fabrics that contain light-sensitive dyes or pigments.⁶⁶ Because CFLs offer consumers a lighting alternative that they perceive as not furthering their self-interest due to the bulbs' cost

59. See Carlson, *supra* note 15, at 1296 ("Increasing convenience seems more effective than most persuasive techniques aimed at increasing participation[,] . . . [and it] appears to result in sustained behavioral change.").

60. See Leora Broydo Vestel, *The Bulb That Saved the Planet May Be a Little Less Than Billed*, N.Y. TIMES, Mar. 28, 2009, at A1 (recounting problems that purchasers of CFLs are encountering and saying that people who thought they could save the planet by screwing in a CFL "are finding the new compact fluorescent bulbs anything but simple").

61. Tom Zeller Jr., *Some Special Handling Required*, N.Y. TIMES, Mar. 28, 2009, at A12.

62. Vandenberg, *Beyond Elegance*, *supra* note 16, at 83 (noting that guilt is the primary "internal enforcement mechanism" inhibiting norm violations); see also *id.* at 85 (noting that the possibility that there may be confusion about the desired specific behavior may make any norm of good environmental behavior ambiguous, which can lessen the guilt an offender might otherwise feel from her deviant behavior).

63. U.S. Dep't of Energy, Energy Efficiency and Renewable Energy, Residential Buildings, <http://www1.eere.energy.gov/buildings/residential/lighting.html> (last visited Oct. 20, 2009); see also Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21, 97 (2001) (stating that "the extent to which consumers will in fact pay more for 'green' products and services is unclear").

64. STEFAN FASSBINDER, LEONARDO ENERGY, HOW EFFICIENT ARE COMPACT FLUORESCENT LAMPS? 8 (2008), available at http://www.leonardo-energy.org/webfm_send/219; L.J. SANDHAL ET AL., PAC. NW. NAT'L LAB., COMPACT FLUORESCENT LIGHTING IN AMERICA: LESSONS LEARNED ON THE WAY TO MARKET 2.1, 2.3 (2006), available at http://www.pnl.gov/main/publications/external/technical_reports/PNNL-15730.pdf.

65. H. STERLING BURNETT & AMANDA BERG, NAT'L CTR. FOR POLICY ANALYSIS, LIGHTS OUT FOR THOMAS EDISON 1 (2008), <http://www.ncpa.org/pdfs/ba637.pdf>.

66. See M. Khazova & J.B. O'Hagan, *Optical Radiation Emissions from Compact Fluorescent Lamps*, 131 RADIATION PROTECTION DOSIMETRY 521, 521 (2008), available at <http://rpd.oxfordjournals.org/cgi/reprint/131/4/521.pdf> (noting that CFLs produce small amounts of ultraviolet radiation); U.S. GEN. SERVS. ADMIN., CARE AND MAINTENANCE: RECOMMENDATIONS FOR ARTWORK IN THE FINE ARTS COLLECTION § 3.4 (2005), available at http://www.gsa.gov/graphics/pbs/GSA_FineArts_3_Textiles.pdf (discussing ways by which to protect textiles from ultraviolet light sources, including fluorescent lights).

and unsatisfactory attributes, it is less likely that they will replace their inexpensive, perfectly satisfactory incandescent bulbs.⁶⁷

These problems might be overcome by buying the right bulb, but the packaging information about CFL performance is too technical and hard for the average consumer to understand.⁶⁸ Consumers need the equivalent of a Rosetta stone to decipher the differences among CFLs with respect to the quality of their light, their cost, and turn-on-time to figure out which CFL each should select.⁶⁹

Another problem with CFLs is that each CFL bulb contains an average of four milligrams of mercury.⁷⁰ Although a naturally occurring element, human exposure to high levels of mercury can damage the brain, heart, kidneys, and immune system,⁷¹ while birds and mammals exposed to high levels of methylmercury⁷² can experience reduced reproduction, retarded growth, abnormal behavior, and even death.⁷³ The presence of mercury means that used or damaged CFLs should be specially recycled and not disposed of in the garbage where they would end up in a landfill or in a waste incinerator.⁷⁴ However, to date, there are very few sites where CFLs can be recycled;⁷⁵ most of these locations can only be found by going online.⁷⁶ The need to recycle CFLs adds to

67. See Vandenberg, *From Smokestack to SUV*, *supra* note 16, at 521 n.13 (“Research on seat belt use, smoking, and other behaviors suggests that major shifts can occur where the behavior change will benefit the individual. Where the harms of an individual’s behavior are externalized, or where habits or other barriers exist to self-interested change, influencing behavior may be far more difficult.”).

68. See Vestel, *supra* note 60 (quoting a consumer of a CFL as saying, “We’re both college-educated and pay attention to labels[, but] . . . [i]t feels like someone forgot to put a place to find the information.”).

69. *Id.*; see also Zeller, *supra* note 61 (finding the statement by experts at Rensselaer Polytechnic Institute that CFLs required “a little insight and planning” to be an “understatement”).

70. ENERGY STAR, FREQUENTLY ASKED QUESTIONS: INFORMATION ON COMPACT FLORESCENT LIGHT BULBS (CFLS) AND MERCURY 1 (2008), http://www.energystar.gov/ia/partners/promotions/change_light/downloads/Fact_Sheet_Mercury.pdf.

71. U.S. Env’tl. Prot. Agency, Mercury: Basic Information, <http://www.epa.gov/mercury/about.htm> (last visited Oct. 20, 2009).

72. Methylmercury is produced when mercury in the air is deposited in water where “certain microorganisms can change it into methylmercury, a highly toxic form [of mercury] that builds up in fish, shellfish[,] and animals that eat fish.” *Id.*

73. *Id.*

74. See Energy Star, Answers: What Are the Mercury Emissions Caused by Humans? Do CFLs that End Up in a Landfill Contribute to These Emissions?, http://energystar.custhelp.com/cgi-bin/energystar.cfg/php/enduser/std_adp.php?p_faaid=5411&p_created=1220627774 (last visited Oct. 20, 2009) (stating that the EPA estimates that if all 290 million CFLs sold in 2007 were sent to landfill sites, only 0.1%, or 0.13 metric tons, of mercury emissions would be added to the United States’ annual average of 104 tons).

75. See, e.g., Stephanie Rosenbloom, *Home Depot Offers Recycling for Compact Fluorescent Bulbs*, N.Y. TIMES, June 24, 2008, at C1 (stating that only two percent of CFLs are recycled).

76. See, e.g., U.S. Env’tl. Prot. Agency, Mercury-Containing Light Bulb (Lamp) Collection

their inconvenience.

Even though, in theory, the mercury from damaged or improperly disposed of CFLs is offset by the reduction in mercury emissions from power plants because of CFL use,⁷⁷ improper disposal of CFLs does release mercury into the environment.⁷⁸ The mercury in CFLs poses additional problems should one break in the home where the amount of mercury released under those circumstances can exceed EPA guidelines for chronic exposure to mercury.⁷⁹ A broken CFL triggers complex cleaning procedures, including clearing the room of people and pets and sealing broken bulbs in plastic before disposal.⁸⁰ Mercury in CFLs additionally creates a conflict between the norms of energy conservation and environmental protection.⁸¹ A conflict between norms makes it difficult for even the most ardent environmentalist to figure out what the “right” action is.⁸²

Therefore, despite their obvious economic benefit to the individual and wider social benefit of reducing energy consumption, getting individuals to make the effort, spend the money, and adopt what could be seen as the less appealing option of swapping out their light bulbs for CFLs is not a frictionless endeavor. Nonetheless, it still may be easier to get individuals to replace a single incandescent light with a CFL than to turn off lights or to refrain from buying electronic appliances, which

and Recycling Programs Where You Live, <http://www.epa.gov/epawaste/hazard/wastetypes/universal/lamps/live.htm> (last visited Oct. 20, 2009) (providing links to sites where damaged or worn out bulbs can be recycled).

77. Energy Star, Compact Florescent Light Bulbs (CFLs) and Mercury, http://www.energystar.gov/index.cfm?c=cfls.pr_cfls_mercury (last visited Oct. 20, 2009). Based on the United States’ coal usage, the power consumed by a CFL is estimated to amount to 1.2 milligrams of mercury released into the environment; whereas a conventional incandescent light bulb results in the release of 5.8 milligrams of mercury. ENERGY STAR, *supra* note 70, at 1. In areas of the country where electricity is generated by coal fired power plants, the savings in electricity would more than offset the mercury released by these bulbs when they are discarded in landfills. *Id.*

78. Energy Star, *supra* note 77.

79. DEB STAHLER ET AL., ME. DEP’T OF ENVTL. PROT., MAINE COMPACT FLUORESCENT LAMP STUDY 7-9, 25-26 (2008), available at <http://maine.gov/dep/rwm/homeowner/cflreport/cflreport.pdf>. There seems to be some uncertainty about the health impacts on sensitive subpopulations at these levels as well as the ability to remove mercury from carpeting and how to dispose of broken CFLs. *Id.* at 9 & n.10, 40-41, 63-66.

80. See Zeller, *supra* note 61 (“If you break a bulb, the Environmental Protection Agency recommends precautions to avoid mercury exposure: Clear people and pets from the room and open a window for at least 15 minutes if possible. Avoid vacuuming. Scoop up larger pieces with stiff paper or cardboard, pick up smaller residue with sticky tape, and wipe the area with a damp cloth. Put everything into a sealed plastic bag or sealed glass jar.”).

81. See Babcock, *supra* note 4, at 152 (discussing what happens when there are conflicting norms).

82. Alex Williams, *That Buzz in Your Ear May Be Green Noise*, N.Y. TIMES, June 15, 2008, at ST1 (“Trying to do right by the environment means sorting through the conflicting din.”).

make our lives so much more convenient and pleasant,⁸³ even though the social and individual benefits of the latter, in terms of reduced electricity use, may be greater.

This Article now turns to the three approaches mentioned previously—smart meters, comparative billing, and personal incentives—to see if the motivational techniques buried in each of them can overcome the obstacles that prevent individuals from adhering to the energy conservation norm by purchasing CFLs.⁸⁴

C. Identifying and Assessing the Success of Different Approaches to Overcoming Behavioral and Structural Barriers to Using CFLs

This section of the Article examines three possible approaches to getting people to reduce their energy consumption by switching to CFLs. Two of these approaches, smart meters and comparative billing, are already in use in some areas of the country.⁸⁵ The third, personal incentives, has not been applied to reduce energy consumption, but has been used in a variety of other areas to get people to change their behavior. Each approach is separately explored below by identifying and evaluating the effectiveness of their motivational mechanisms.

1. Smart Meters

Smart meters are a part of the so-called “smart grid,” a computer-based network of “sensors and control devices on the nation’s high-voltage transmission networks, coupled with instantaneous communications among grid managers, generators and customers.”⁸⁶ The electric power grid currently is a patchwork of individual and regional transmission systems that has been compared to “your grandmother’s patchwork quilt, and is about as frayed[,]” and it costs electricity consumers billions of dollars a year because of congestion and

83. See *supra* note 34 (discussing the strength of habits).

84. Stern, *supra* note 34, at 561-62 (stating that getting people to curtail their behavior is “challenging because it requires continuing reinforcement” unlike a decision to buy a new appliance which “requires only a one-time incentive”).

85. See, e.g., Leslie Kaufman, *Utilities Turn Their Customers Green, with Envy*, N.Y. TIMES, Jan. 31, 2009, at A1 (discussing cities such as Sacramento, Chicago, and Seattle who use comparative billing methods); Posting of Erik Olsen to Green Inc. Blog, <http://greeninc.blogs.nytimes.com/2008/10/07/smart-meters-open-market-for-smart-apps/> (Oct. 7, 2008, 16:19 EST) (stating that smart meter programs are underway in Southern California, Oklahoma, and Western Arkansas).

86. Peter Behr, *Technology: The Smart Grid, an ‘Internet for Electricity,’ vs. Business as Usual*, CLIMATEWIRE, Feb. 27, 2009, <http://www.eenews.net/climatewire/print/2009/02/27/4>. It will cost billions of dollars to “[s]marten [u]p” the nation’s electric power grid and require a “‘major paradigm shift’” in how people consume electricity. Slevin & Mufson, *supra* note 11.

resultant power outages.⁸⁷ The current grid needs to be modernized before anything like smart meters can be effectively used.

Smart meters audit energy consumption in greater detail than conventional meters.⁸⁸ They are designed to give the utilities real time information about their customers' use of electricity.⁸⁹ This information is transmitted to the local utility for monitoring⁹⁰ and billing purposes. In the future, smart meters will tell consumers when power is the cheapest and will even be able start an appliance automatically or turn it off during a period of peak electricity demand.⁹¹

Smart meters have taken time to catch hold in this country, but programs to deploy them are now underway in several cities.⁹² For example, Southern California Edison recently announced its intention to "install . . . 5.3 million meters between 2009 and 2012 at a cost [to the utility] of \$1.63 billion."⁹³ Oklahoma Gas & Electric, which serves 765,000 customers in Oklahoma and western Arkansas, has joined forces with a network of hardware and software providers and a company that provides Web-based energy monitoring software to help the utility's customers lower their energy use and thus lower their monthly bills.⁹⁴ Duke Energy has allocated over one billion dollars over the next five years to install smart meters and other upgrades to its system.⁹⁵

However, most of the smart meters now in use do not give residential electricity users information on their individual use.⁹⁶ One

87. Slevin & Mufson, *supra* note 11.

88. Posting of Erik Olsen, *supra* note 85.

89. *Id.* This discussion does not include the associated environmental costs of producing and disposing of smart meters.

90. *Id.* This information helps utilities monitor the distribution of power in its system and thus hopefully avoid blackouts or other disruptions of electrical service due to higher than anticipated use. Slevin & Mufson, *supra* note 11.

91. Slevin & Mufson, *supra* note 11.

92. A program on Washington's Olympic Peninsula that installed various sensors and meters in 110 homes that allowed people to adjust their thermostats when electrical prices were high saw a drop of ten percent in their monthly electrical bills and the system's peak load went down about fifteen percent. *Id.* Showing a surprising communitarian spirit when these same customers were told that cutting back on their electric power usage during a major storm would assure that there would be some power for all, demand dropped to fifty percent of normal levels. *Id.*

93. Posting of Erik Olsen, *supra* note 85.

94. *Id.*

95. Slevin & Mufson, *supra* note 11.

96. Giving utilities intelligence about an individual household's electricity consumption has engendered "a fair amount of skepticism" about whether that information will benefit the utility or its customers. Phil Taylor, *Electricity: Will Americans Learn to Love 'Smart Grid'?*, GREENWIRE, Feb. 27, 2009, <http://www.eenews.net/Greenwire/print/2009/02/27/1>. In an effort to explain customers' skepticism, one power industry executive stated that "[a] lot of people wonder if this is another thing that's going to benefit the utility at the expense of the consumer." *Id.*

exception to this is Oklahoma Gas & Electric, which not only provides this information directly to its customers, but also includes information on how the customers' neighbors are doing.⁹⁷ Google is promoting a particular type of smart meter that will display information online "almost in real time" for its customers.⁹⁸ Google is lobbying Washington and other public agencies to invest in smart meters with the hopes that 140 million homes will be equipped with their meters in the next few years.⁹⁹

The assumption behind smart meters is that individuals do not currently have information that makes them aware of how much energy they are using, and that if they had that information, they would reduce their use of electricity either because they want to lower their monthly bills or because, as environmentally responsible individuals, they want to reduce harmful emissions from coal-fired power plants. Thus, information is the persuasive tool that smart meters employ, which puts a premium on the effectiveness of the information that tells consumers about their excessive use of electricity.¹⁰⁰ Although my prior work emphasizes the importance of information in changing personal behavior, that work also recognizes the limits of information as a solitary motivational force.¹⁰¹ Some of these constraints are set forth below.

For example, individuals have a hard time accurately processing environmental information pertaining to environmental risks, and they use a variety of heuristics, which can distort the information's accuracy and thwart its intended purpose.¹⁰² These flawed problem solving

97. Posting of Erik Olsen, *supra* note 85. A variation on this idea is being promoted by Xcel Energy to its customers in Colorado, which allows its customers to go online and calculate the amount of carbon dioxide emitted to meet their individual electrical power and heating needs. Xcel has 1.6 million customers in the state. But even Xcel admits that "[c]ustomers may choose when they have that information to use less energy as a way to make personal choices around their carbon footprint." Andy Vuong, *The Power Behind Figuring Footprint: Xcel Customers Will Soon Be Able to Calculate Carbon-Dioxide Emissions*, DENVER POST, Feb. 16, 2009, at A-23.

98. Posting of Ed Lu to Google Blog, <http://googleblog.blogspot.com/2009/02/power-to-people.html> (Feb. 9, 2009, 20:39 EST).

99. *Id.*

100. See Slevin & Mufson, *supra* note 11 (quoting the Chief Executive of Southern Company, "[j]ust because you plug in a smart meter . . . doesn't mean a customer will immediately take smart actions").

101. See Babcock, *supra* note 4, at 165-70; Daniel W. Shuman, *The Psychology of Deterrence in Tort Law*, 42 U. KAN. L. REV. 115, 163 (1993) (stating that the task of educating the public to accurately calculate the risks of their behavior seems "insurmountable"). *But see* Bill Marsh, *A Battle Between the Bottle and the Faucet*, N.Y. TIMES, July 15, 2007, at WK14 (quoting Emily Lloyd, Commissioner of New York City's Department of Environmental Protection, saying that "[t]hrough education and motivation you can get people to change their habits," in this case, switching from environmentally harmful bottled water to tap water).

102. See Babcock, *supra* note 4, at 127-28 (discussing various problems people have processing information, including selecting information that will support some stereotypical

techniques may make it difficult for individuals to relate their rate of energy consumption as reflected on their monthly bill, let alone changing a light bulb, to a reduction in greenhouse gases and then to global sea level rise, both of which are geographically and temporally distant. Information about environmental harms and the cause of those harms is frequently contested; the sources may not be seen as credible because they have a vested interest in a particular outcome, like the manufacturers of CFLs who want to sell bulbs, and the information is often complex and frequently highly technical.¹⁰³

The complexity and volume of information about environmental harms make it extremely difficult to convey the magnitude of a particular environmental risk—here, the need to reduce energy consumption because of the associated environmental and even national security concerns.¹⁰⁴ Too much information can lead to information overload, or “green fatigue,”¹⁰⁵ and the marginalization of information about environmental harm, causing people to tune out the message.¹⁰⁶ To the extent that purchasing CFLs is tied to global climate change, the potential consumer finds herself bombarded with information, often conflicting, about the phenomenon, requiring her to make the seemingly improbable leap from a single CFL to shrinking glaciers, as noted previously. Additionally, the climate change debate is becoming increasingly shrill and dominated by advocates on both sides of the issue who seek to simplify the message and use alarmist language, often with

conclusion they have reached); see also Stewart, *supra* note 63, at 141 (“Even if perfectly collected and disseminated, [information as a regulatory tool] depends on the willingness and ability of individuals to properly process the information provided accurately and to act on it. People have limited time, energy, and attention Also, people use heuristics, including those based on their prior experiences, to process information and deal with uncertainty. Their perceptions of risks are affected by socioeconomic variables and by their psychological saliency and accessibility may produce significant distortions.”).

103. See Martha C. Monroe, *Two Avenues for Encouraging Conservation Behaviors*, 10 HUM. ECOLOGY REV. 113, 119 (2003). (“Durable behavior, which is the result of effortful information processing (i.e. elaboration), is more achievable when cognitive involvement is high, arguments are strong, sources are credible, topics are relevant, message is clear, distractions are few, and comparisons are favorable.”).

104. Stewart, *supra* note 63, at 141 (“Environmental problems are inherently complex and are often characterized by significant uncertainties. Yet, efforts to communicate fully such complexities and uncertainties would produce information overload, leading people to simply disregard or discount the communication or distort it through simplification.”).

105. Williams, *supra* note 82.

106. Stewart, *supra* note 63, at 140; see also Cass R. Sunstein, *Informational Regulation and Informational Standing: Akins and Beyond*, 147 U. PA. L. REV. 613, 627 (1999) (“With respect to information, less may be more. If information is not provided in a clear and usable form, it may actually make people less knowledgeable than they were before, producing overreactions, or underreactions, based on an ability to understand what the information actually means.”).

negative effects on the listener.¹⁰⁷

The content of information and the context in which it is presented are critical for information to be effective.¹⁰⁸ With respect to environmental information, it is particularly important that the information's content connect an individual's behavior to whatever the environmental problem is and show how a change in that behavior may diminish the problem.¹⁰⁹ It also helps if the information shows that other people in similar situations are "doing their fair share"¹¹⁰ and that behaving in a more environmentally responsible way will not make the individual look like a "sucker."¹¹¹ Those requirements are difficult to satisfy here. Connecting a single light bulb to global climate change is challenging for even the most knowledgeable consumer, while the cost and intrusiveness of collecting information about other people's behavior¹¹² and the fact that people change light bulbs in the privacy of the home means there is no way of knowing if anyone else is engaging in the same activity.

For information to change behavior, it must, among other things, "resonate[] with the values of the recipient,"¹¹³ come from a trusted source,¹¹⁴ and inform the individual of what the correct behavior is.¹¹⁵ Again, information as a motivational tool to change the level at which individuals consume energy is in trouble. The extent to which energy conservation information does not resonate with the values of those who measure their self-worth by material consumption may create a problem

107. See Vandenberg, *supra* note 34, at 1138 (complaining that alarmist language "can have a 'boomerang effect'"); Stewart, *supra* note 63, at 139-40 (noting a problem with negative information, such as "disclosure of health risks," is that they are "uninformative (because they fail to convey the magnitude of the risks posed by different substances) and alarmist," and that "too much information may overwhelm consumers, or simply cause them to disregard it entirely").

108. See Shuman, *supra* note 101, at 162 ("[P]eople tend to evaluate information based upon the way the information is framed."). Cf. Vandenberg, *supra* note 34, at 1134-35 (commenting on the ineffectiveness of eco-labels and stating "several studies have concluded that eco-labels have little effect on consumer behavior[,] . . . unless most or all other factors (e.g., the price and quality of the good) are equal").

109. Vandenberg, *supra* note 34, at 1123-24.

110. *Id.* at 1124.

111. *Id.*

112. *Id.* at 1123 ("[G]athering information on the contribution of any one individual often is prohibitively expensive and intrusive.").

113. P. Wesley Schultz & Lynnette Zelezny, *Reframing Environmental Messages to be Congruent with American Values*, 10 HUM. ECOLOGY REV. 126, 134 (2003); see also *id.* at 131 (criticizing environmental messages for stressing altruism because they ask people "to give up personal convenience or comfort in order to address the problem").

114. Paul C. Stern, *Understanding Individuals' Environmentally Significant Behavior*, 35 ENVTL. L. REP. 10785, 10789 (2005).

115. Carlson, *supra* note 15, at 1296-97 (explaining that face-to-face communication and feedback mechanisms result in greater norm compliance than the provision of information).

for those individuals. People who do not trust utilities as a source of information may summarily reject utility-sponsored information.¹¹⁶ The problem of trust is aggravated here because utilities have a direct interest in getting people to use smart meters as a way of reducing discretionary energy consumption; otherwise they must either buy power in the spot market during periods of peak demand or build expensive new power plants that often are not used except during heavy energy use.¹¹⁷

Many of these problems with relying on information to persuade consumers to reduce the amount of energy they consume by switching the type of light bulbs they use can be overcome, for example, by carefully crafting the message to point out the immediate direct benefit to the consumer of lower electricity bills. This is especially true where consumers are already environmentally socialized—that is, already adherents of the norm of individual environmentally responsible behavior and practitioners of other good environmental behavior like recycling.¹¹⁸ Although it may be difficult for individuals to appreciate that changing one light bulb can help reduce emissions of greenhouse gases and thus help save drowning polar bears, information showing this connection is readily available and accessible to the layperson.¹¹⁹ Connecting a desired new behavior (conserving electricity by changing light bulbs) with behaviors that are already popular (protecting iconic species like polar bears) can give a boost to the new behavior.¹²⁰

In the case of electricity consumption, utilities already have information about how much electricity their customers are using, so there is no additional cost for collection, nor is there any additional intrusion on personal privacy.¹²¹ It is also easy for utilities to present that information in a way that puts their customers' behavior in the context of the behavior of other customers or to include bill stuffers that tell stories

116. See Taylor, *supra* note 96 (attributing the public's loss of trust in utilities to the rate increases that happened simultaneously with deregulation).

117. Slevin & Mufson, *supra* note 11.

118. Stewart, *supra* note 63, at 135 (stating that environmental socialization information can create a "demand in favor of environmentally friendly products").

119. See *supra* notes 38-43 and accompanying text (discussing the impact of converting a single incandescent bulb to a CFL).

120. See Lawrence Lessig, *The Regulation of Social Meaning*, 62 U. CHI. L. REV. 943, 1009 (1995); see also Vandenberg, *supra* note 34, at 1163 ("[I]nformation about the dioxin released from backyard burning may be necessary to generate the public support for community-wide garbage collection or to fund public information campaigns that inform individuals about materials that should not be burned in backyard barrels.").

121. Of course sharing information about individual consumption of electricity with others runs the risk of violating the privacy norm, which is held in high esteem in this country. See Babcock, *supra* note 4, at 159.

about what people are doing to reduce their electricity consumption.¹²² This would avoid the problem of people feeling like dupes, if they engage in the desired behavior.

Other problems may not be overcome so easily. No amount of information, even information that shows that mercury emissions from power plants are greater than from a single broken or poorly disposed of CFL, is likely to overcome an individual consumer's concern about the mercury released when that CFL breaks in her home. The direct and immediate cost of purchasing a CFL compared to a traditional incandescent bulb will have greater impact on individual consumers than a reduction in their monthly utility bills because of how people discount future costs.¹²³ Utilities and manufacturers of bulbs like General Electric have not been trusted as reliable sources of environmental information because they have been a major source of environmental problems and will be seen as direct beneficiaries of any campaign to sell CFLs.¹²⁴ And finally, the sheer complexity and amount of technical information involved in selecting the right CFL for a particular consumer, their physical unattractiveness, and the inconvenience of both acquiring and disposing of them cannot be overcome by information alone, even if tied to another appealing image, such as saving polar bears.

This means that to the extent that smart meters depend on the information they convey to reduce the amount of electricity individuals consume, they may not be able to achieve that goal by getting their customers to buy CFLs because information as a motivational tool is too problematic.

2. Comparative Consumer Information

Like the smart meter method, this approach also relies on information to persuade utility customers to decrease their use of electricity. However, the way in which the information is presented to the customer invokes additional motivators of personal action: the conformity norm, competition, and, to some extent, the use of shame.

Both Oklahoma Gas & Electric and Sacramento Municipal Utility

122. This approach is discussed in greater detail in the next part of the Article. *See infra* Part III.C.2.

123. *See* Cass R. Sunstein, *Precautions Against What? The Availability Heuristic and Cross-Cultural Risk Perception*, 57 ALA. L. REV. 75, 89 (2005) (discussing the "availability heuristic" and how peoples' perceptions of risks are influenced by whether the risk is "cognitively available"); *see also* Cass R. Sunstein, *Irreversible and Catastrophic*, 91 CORNELL L. REV. 841, 870-71, 875 (2006) (stating that people are likely to "treat the risk as essentially zero" and pay little to prevent it, especially when "the costs of precautions are incurred immediately" while its "benefits will not be enjoyed until decades later").

124. *See supra* notes 116-17 and accompanying text.

District (“SMUD” or “the Utility”) are trying to motivate their residential customers to reduce energy consumption by giving them information not only about their own use of electricity, but also information about how much electricity their neighbors are using.¹²⁵ SMUD’s residential customers receive monthly bills that compare their level of energy consumption against one hundred of their neighbors who live in comparable size homes and who use the same heating fuel.¹²⁶ The monthly statement also contains information that separately compares the household’s level of energy consumption with twenty neighbors who have been singled out because of their efficiency in conserving energy.¹²⁷ The Utility resorted to this tactic after years of trying to get its customers to reduce energy use through other tactics, such as offering rebates for energy saving appliances.¹²⁸ SMUD customers who received these personalized reports in their bills reduced their energy use by two percent compared to those who were sent standard statements.¹²⁹ SMUD’s success has prompted utilities in ten other major metropolitan areas, including Chicago and Seattle, to adopt the same program.¹³⁰ Oklahoma Gas & Electric, as mentioned earlier, provides similar comparative information on energy use within a neighborhood.¹³¹

The use of comparative billing information taps into the conformity norm.¹³² “It is fundamental and primitive The mere perception of the normal behavior of those around us is very powerful.”¹³³ The conformity norm¹³⁴ arises because “people ‘frequently use the beliefs, attitudes, and actions of others, particularly similar others, as a standard

125. See Kaufman, *supra* note 85 (describing SMUD’s program); Posting of Erik Olsen, *supra* note 85.

126. See Kaufman, *supra* note 85.

127. *Id.*

128. *Id.* (reporting on a 2004 experiment by Robert Cialdini, a social psychologist at Arizona State, where the only message left hanging on doorknobs in a middle-class San Diego suburban neighborhood that had a significant effect on reducing energy consumption was the one that said the individual’s neighbors had already taken steps to reduce energy consumption; messages exhorting people to save the earth or even save money had no significant effect).

129. *Id.*

130. *Id.*

131. See *supra* note 97 and accompanying text.

132. A shorthand way of describing the conformity norm is “[i]f everyone is doing it, it must be a sensible thing to do.” Vandenbergh, *Beyond Elegance*, *supra* note 16, at 112 n.198. Like habits, the conformity norm “provides an efficient ‘decisional shortcut.’” *Id.* (quoting Robert B. Cialdini et al., *A Focus Theory of Normative Conduct: Recycling the Concept of Norms to Reduce Littering in Public Places*, 58 J. PERSONALITY & SOC. PSYCHOL. 1015, 1015 (1990)).

133. Kaufman, *supra* note 85 (quoting Robert Cialdini). Kaufman cites the example of one SMUD customer who, after receiving her personal statement, bought a new energy efficient washer and dryer, put her lights on timers, and unplugged her “kegerator” (a draft beer cooler) and whose energy consumption is now equal to her neighbors. *Id.*

134. Vandenbergh, *Beyond Elegance*, *supra* note 16, at 112.

of comparison against which to evaluate the correctness of their own beliefs, attitudes, and actions.”¹³⁵ Therefore, one way to increase an individual’s good environmental behavior is to provide information on how well others are performing the same task as well as feedback on the individual’s own performance.¹³⁶ This is exactly what the two utilities are doing.

The other motivational force that the two utilities have tapped into is competition. “As Americans, we are good at . . . competition . . . It’s the part of this culture that people really understand . . .”¹³⁷ For decades, colleges have encouraged competition, both between different schools and among dormitories on the same campus, in an effort to reduce overall energy consumption.¹³⁸ Recently, those collegiate competitions have become even more intense. For example, at Central College in Pella, Iowa, where students, who compete to see which suite of rooms in a “green dorm” has the lowest level of energy consumption, are going off campus to charge their cell phones.¹³⁹ Although individual homeowners are less likely to compete, various households in three Massachusetts towns (Medford, Arlington, and Cambridge) who participated in a competitive game called “Energy Smackdown” reduced their energy use up to sixty-six percent during the course of the year-long game.¹⁴⁰ One positive result of lifestyle changing games like Energy Smackdown is that even after the competition ends, the contestants continue to practice good environmental behavior because they have formed new habits, which are neither costly nor inconvenient to continue.¹⁴¹

135. *Id.* at 114 (quoting Robert B. Cialdini, *Social Motivations to Comply: Norms, Values, and Principles*, in 2 TAXPAYER COMPLIANCE 200, 213 (Jeffrey A. Roth & John T. Scholz eds., 1989)); see also *supra* note 132.

136. See Carlson, *supra* note 15, at 1290 (“The evidence suggests that esteem matters; many individuals care what others think of them. Cooperative behavior typically increases when opportunities to communicate esteem (or lack of it) increase . . .”).

137. Kaufman, *supra* note 85 (quoting the executive director of the nonprofit responsible for the Energy Smackdown program). “Energy Smackdown” is a reality series game designed to encourage energy conservation that is shown on local cable TV. *Id.* The game discussed in the article involved ten families from three different Massachusetts communities (Cambridge, Medford, and Arlington). *Id.*

138. Another example of environmental competitions between colleges and universities is “RecycleMania,” in which schools compete over a ten-week period to reduce the amount of resources they use and waste they produce, by transforming a waste reduction message into a message any college student can understand—“beating the cross town rival.” RecycleMania, <http://www.recyclemaniacs.org/overview.htm> (last visited Sept. 28, 2009).

139. Kaufman, *supra* note 85.

140. *Id.*

141. See Dave Copeland, *Neighborly Competition: Residents in 3 Communities Try to Outdo Each Other in the Energy Smackdown*, BOSTON SUNDAY GLOBE, Aug. 17, 2008, at H1.

While the conformity norm and competition may inspire individuals to improve their energy conservation performance when the information about their performance is positive or they win, the effectiveness of negative comparative information, or losing, to some extent depends on the individual feeling ashamed of her poor performance.¹⁴² However, shame is an extremely problematic motivator.¹⁴³ On the one hand, fear of embarrassment or public humiliation can motivate individuals to obey minor laws like municipal ordinances exhorting pet owners to scoop their pet's poop and not to litter, and can encourage individuals to avoid behaviors that may be harmful to others.¹⁴⁴ On the other hand, there are serious problems with using humiliation as a sanction that severely undermines its usefulness, especially where what is essentially private behavior (using too much electricity) is broadcast to others, as it is in the case of comparative billing and energy competitions.¹⁴⁵

At an extreme level, public humiliation can cripple the embarrassed individual's sense of self-esteem¹⁴⁶ because they have not only "lowered [themselves] . . . in [their] own eyes" but also "in the eyes of other people."¹⁴⁷ There can be negative spillover effects on the offender's immediate family, who may have played a limited role in the offending behavior.¹⁴⁸ Additionally, using public humiliation to shame a profligate

142. See Carlson, *supra* note 15, at 1299-1300 (suggesting that neighborhood recycling competitions would not be effective to increase recycling if individuals who performed under par did not care what their neighbors thought of them).

143. See Deni Smith Garcia, *Three Worlds Collide: A Novel Approach to the Law, Literature, and Psychology of Shame*, 6 TEX. WESLEYAN L. REV. 105, 121 (1999) ("Shame, the emotion, actually falls along a continuum of emotions ranging from embarrassment on one end to mortification on the other."); see also Babcock, *supra* note 4, at 159-65 (discussing shame at length).

144. Peter H. Huang & Christopher J. Anderson, *A Psychology of Emotional Legal Decision Making: Revulsion and Saving Face in Legal Theory and Practice*, 90 MINN. L. REV. 1045, 1064 (2006) (reviewing MARTHA C. NUSSBAUM, *HIDING FROM HUMANITY: DISGUST, SHAME, AND THE LAW* (2004)); see also Stephen P. Garvey, *Can Shaming Punishments Educate?*, 65 U. CHI. L. REV. 733, 752 (1998) (arguing that when the deterrent value of shaming is added to "the moralizing effects of widespread publicity of offenders' wrongdoing," shaming performs an educative function for the community and thus may contribute to maintaining social order). *But see* Dan M. Kahan & Eric A. Posner, *Shaming White-Collar Criminals: A Proposal for Reform of the Federal Sentencing Guidelines*, 42 J.L. & ECON. 365, 373 (1999) ("Shaming produces highly imperfect deterrence . . .").

145. Indicating the sensitivity of individuals to embarrassment or humiliation, SMUD discontinued the use of frowny faces to indicate poor energy conservation performance because the company received too many complaints about them. See Kaufman, *supra* note 85.

146. Dan M. Kahan, *Shaming White Collar Offenders*, 12 FED. SENT'G REP. 51, 52 (1999).

147. Richard A. Posner & Eric B. Rasmusen, *Creating and Enforcing Norms, with Special Reference to Sanctions*, 19 INT'L. REV. L. & ECON. 369, 371 (1999).

148. Joshua Andrix, Note, *Negotiated Shame: An Inquiry into the Efficacy of Settlement in Imposing Publicity Sanctions on Corporations*, 28 CARDOZO L. REV. 1857, 1870 (2007); Garcia,

user of electricity in the eyes of her community seems totally out of proportion with the deviant behavior in this situation—the failure to conform to the norm of energy conservation—and thus runs the risk of violating a bedrock principle of punishment theory: proportionality.¹⁴⁹

In addition, there are practical problems associated with using public embarrassment as a way to improve personal behavior in any situation, but particularly here. For example, for shame to have a wide educative, behavioral changing effect, there must be a community that agrees the offender's actions are bad,¹⁵⁰ otherwise public humiliation can lead to an increase in bad behavior in a show of solidarity.¹⁵¹ The extravagant use of energy referred to earlier in this Article¹⁵² makes it doubtful that there is wide support for the energy conservation norm, let alone support for it in any particular community. There must also be a community whose good opinion the offender values and does not want to lose.¹⁵³ In our atomistic culture, this community may not exist.¹⁵⁴ Even when there are such communities, it is highly unlikely that individuals will publicly humiliate a friend or a neighbor for what may seem to many as a minor, let alone private matter: wasting electricity. There is also a risk that if too many people in a community are being humiliated, that is more neighbors are receiving poor report cards from their utilities as opposed to good ones, the deterrent value of negative reports will drop.¹⁵⁵ Enough bad report cards also create little incentive for individuals to deviate from what appears to be a norm of poor environmental performance, lest they look like a patsy or “dupe.”¹⁵⁶

supra note 143, at 118 (“[S]haming is particularly stigmatic to innocent third-party relations given the public nature of a shaming.”).

149. See Kahan & Posner, *supra* note 144, at 385 (stating that the severity of shaming's impacts could undermine the goal of making the penalty proportionate to the offense).

150. Alex Geisinger, *A Group Identity Theory of Social Norms and Its Implications*, 78 TUL. L. REV. 605, 648 (2004).

151. See Toni M. Massaro, *Shame, Culture, and American Criminal Law*, 89 MICH. L. REV. 1880, 1933 (1991) (arguing that shaming can actually result in an increase in violations).

152. See *supra* notes 18-30 and accompanying text.

153. See Garvey, *supra* note 144, at 753 (“As for general deterrence, much depends on the nature of the relevant community. At one extreme, a community may be so atomized that no one cares very much about what anyone thinks of anyone else . . . Shame is unlikely to play a significant role in the social life of so thin an association.”); see also Karp, *supra* note 33, at 316 (arguing that the effectiveness of shame depends on ostracizing or excluding an individual from a community).

154. See, e.g., Massaro, *supra* note 151, at 1916; David A. Skeel, Jr., *Corporate Shaming Revisited: An Essay for Bill Klein*, 2 BERKELEY BUS. L.J. 105, 108 (2005) (noting that both population diversity and political polarization in the United States pose challenges to the effectiveness of shaming).

155. Massaro, *supra* note 151, at 1930-31 (discussing how when shaming sanctions become too common, they lose their deterrent value).

156. See Vandenbergh, *Beyond Elegance*, *supra* note 16, at 112 (“[P]erceptions of widespread

Therefore, despite some positive attributes of public embarrassment as a means of encouraging good environmental behavior, the negative qualities of publicly humiliating someone may well overwhelm its usefulness as a means of encouraging energy conservation, let alone swapping out light bulbs. To the extent that comparative billing depends in some circumstances on triggering shame for its effectiveness, notwithstanding the power of the conformity norm and competition, the negative aspect of shame as a motivational tool may lessen the approach's effectiveness as well.

3. Personal Incentives

Personal incentives are a potential third way to encourage individuals to buy CFLs;¹⁵⁷ the incentives can be economic or non-economic.¹⁵⁸ Economic incentives play to the consumer's pocket book; while the non-economic incentives, like awards or other types of praise, are directed at the consumer's sense of self-esteem or desire for the esteem of her community.¹⁵⁹

The goal of giving someone an economic incentive to engage in good environmental behavior is to overcome a situation where "the payoff" from a public environmental good like clean air, a benefit of reducing energy consumption, is "less tangible than direct economic gain."¹⁶⁰ The added inducement of money (like a refund), or something of value (a redeemable coupon), combined with the self-esteem that is generated when one engages in a socially responsible action, can be enough to "tip[] the cost-benefit equation" in favor of the desired action.¹⁶¹ In fact, economic incentives may be more effective than education, other forms of persuasion, or feedback in changing

noncompliance undermine compliance."); *see also id.* at 114 ("[C]ooperation decreases if compliers view themselves as 'dupes.'").

157. *See* Shuman, *supra* note 101, at 153 (favoring positive rewards over punishment).

158. This analysis does not include changes in CFL design, qualities, or initiatives that would make their acquisition and disposal easier. *See supra* notes 59-78 and accompanying text (noting several design problems that inhibit more widespread use of CFLs). As discussed later in this Article, these may be the only changes that will induce people into swapping out their light bulbs. *See infra* notes 185-89 and accompanying text.

159. If giving people an economic incentive so that they have more money in their pocket or a redeemable coupon at Starbucks is viewed as increasing their opportunities, then this may make it more likely that they will make a moral commitment to engage in the desired behavior. *See* Robert D. Cooter, *Three Effects of Social Norms on Law: Expression, Deterrence, and Internalization*, 79 OR. L. REV. 1, 19 (2000) (stating that when people see a large enough increase in their opportunities they are more likely to make moral commitments).

160. Carlson, *supra* note 15, at 1250.

161. *See id.* at 1294 (arguing that the deposit money people receive for returning bottles and the "psychic benefit of recycling[] tips the cost-benefit equation").

behavior.¹⁶²

While the monthly reduction in an individual's electric bill from the use of a more efficient light bulb should be a sufficient economic incentive to buy CFLs, clearly it is not because individuals are still not purchasing them. Therefore, additional economic encouragement may be necessary. For example, stores where CFLs are sold could issue coupons for something other than a CFL, redeemable either at the place the purchase was made or some place else, like Starbucks, a local restaurant, or a movie theater. Retailers could also refund a portion of the purchase price of a CFL, issue redeemable coupons for the purchase of replacement bulbs, or offer a reduced price when more than one bulb is purchased.¹⁶³

There are problems, however, with using economic incentives to motivate individuals to make good environmental choices like purchasing CFLs. Offering individuals an economic reward for engaging in good behavior can "undermine or 'crowd out' intrinsic motivation" to do a good thing.¹⁶⁴ Using economic incentives may also weaken the personal or communal psychological advantages of carrying out a supportive action and thereby deter the intended behavior.¹⁶⁵ But if the economic incentive is designed not to be too coercive or controlling¹⁶⁶ and is proportionate to the desired task,¹⁶⁷ intrinsic motivation may not

162. Stern, *supra* note 34, at 562. *But see* Carlson, *supra* note 15, at 1299-1300 ("The most effective techniques for increasing norm compliance, face-to-face contact and behavioral feedback, play on the human desire to be well-regarded by others. These techniques seem then to work on both levels by increasing the opportunities to signal or gather esteem, while simultaneously increasing attitudes in favor of the behavior.").

163. *See* Carlson, *supra* note 15, at 1298 ("[I]f an activity is already convenient, such as residential energy conservation, but requires sustained behavioral change, then individual feedback about energy usage may increase compliant behavior, as may rebates for energy efficient behavior."). *But see* Stewart, *supra* note 63, at 99 (noting that deposit and refund techniques to encourage recycling require people to pay an initial fee when they purchase the item, which is only refunded when they properly dispose of the item or return it).

164. Stern, *supra* note 34, at 564. *But see id.* at 565 (commenting that when people do not have an intrinsic motivation to engage in good environmental behavior, a reduction in that motivation is irrelevant, and that if the desired new behavior is costly, there is little incentive for people to engage in the activity voluntarily).

165. Vandenbergh, *From Smokestack to SUV*, *supra* note 16, at 608 ("[C]are must be taken to ensure that the psychological effects of economic incentives do not undermine their effectiveness. For example, in some circumstances financial inducements appear to undermine the psychic benefits an individual receives for performing a cooperative act and may discourage, rather than encourage, the targeted behavior.").

166. Stern, *supra* note 34, at 564 ("[R]esearch shows that financial rewards reduce intrinsic motivation when the reward is contingent on engaging in an activity, completing a task or, under certain conditions, performing well."); *see also id.* at 565 ("Rewards are most likely to crowd out intrinsic motivation when they are 'controlling,' meaning that the recipient experiences the reward as pressuring or coercing her actions or controlling the manner, time, or place of the activity.").

167. *Id.* at 565.

be decreased, allowing the individual to feel an increase in self-esteem when she engages in the desired activity.¹⁶⁸

Another problem with using economic incentives to spur good behavior is that their effect can be short-lived.¹⁶⁹ Unless the behavioral change (swapping out light bulbs) becomes permanent through the internalization of a concrete norm of energy conservation and the new behavior becomes a habit, the bad behavior (continuing to buy the cheaper, more aesthetically pleasing light bulb) will return the moment the incentive (refund, coupon, or discount) is withdrawn.¹⁷⁰ In fact, empirical studies show that economic incentives only “produce moderate, rather than dramatic, effects on individual environmental behaviors.”¹⁷¹

Increasing the price of incandescent bulbs through a surcharge or tax might encourage the purchase of CFLs.¹⁷² The additional money could be applied to assist in recycling worn out or broken CFLs and thus lessen the inconvenience associated with disposing of CFLs. Increasing the cost of undesirable behavior “tends to reduce the bad behavior and increase the good behavior.”¹⁷³ To the extent that people are sensitive to prices, increasing the price of incandescent bulbs could spur people to buy CFLs.¹⁷⁴ However, raising the price of incandescent bulbs might have a regressive impact on lower income consumers, as it might price both types of bulbs out of their reach.

Non-economic incentives, like awards and praise, do not crowd out the intrinsic motivation to engage in good behavior and have no regressive effect.¹⁷⁵ SMUD uses smiley faces on utility bills to reflect the success, or lack of success, of each individual household’s efforts to

168. *Id.* at 565-66.

169. *Id.* at 562.

170. *See id.* (commenting that the use of a monetary incentive can cause a rapid change in behavior, but its withdrawal can end that good behavior just as quickly). This reaction can be as true for household energy conservation as it is for carpooling, using public transportation, or recycling. *Id.*

171. *Id.* at 560. Most experiments produce only a ten to thirty percent increase in positive environmental behavior across different subject groups. *Id.*

172. *But see* Vandenberg, *From Smokestack to SUV*, *supra* note 16, at 604-05 (calling environmental taxes “politically radioactive”).

173. Carlson, *supra* note 15, at 1297; *see also id.* (stating that “it may be possible to emulate bottle bills in other contexts,” such as using energy efficiency rebates rather than charging for “excessive use”).

174. *See* Shankar Vedantam, *On Climate, Symbols Can Overshadow Substance*, WASH. POST, May 17, 2008, at A1 (commenting that people are more sensitive to prices than they are to ethical and environmental concerns, and observing that interest in hybrid cars surged when gas reached four dollars a gallon). *But see* Carlson, *supra* note 15, at 1293 (stating that reducing barriers to recycling is more effective than making it more expensive to dispose of garbage).

175. Stern, *supra* note 34, at 565.

conserve energy.¹⁷⁶ These smiley faces function like a reward, comparable to the gold stars children receive from their parents for bringing home a good report card or doing household chores, that enhances the individual's self-esteem as well as her standing in the community when that information is shared with her neighbors.

Another example of a non-economic personal incentive that might encourage the purchase of CFLs is a public display of the good behavior. An example of this might be a bumper sticker recognizing the driver's contribution to fighting global climate change through the purchase of CFLs. The CFL bumper sticker would be similar to those extolling the car's occupant for having an "honor roll student" or for supporting a particular cause or political candidate.¹⁷⁷ Alternatively, the names of customers who bought a CFL might be prominently displayed near where CFLs are sold, informing a wider audience of their good behavior and perhaps, in the process, enticing others to behave the same way so they can be part of a similar display.¹⁷⁸

Each of these non-economic incentives not only enhances the individual's self-esteem because others have recognized her good environmental behavior, but also raises her community standing because she gains her community's esteem for engaging in responsible environmental behavior that benefits the community at large.¹⁷⁹ The individual so regarded feels good about her selfless act of buying a CFL, which increases the likelihood that she might engage in that behavior again.¹⁸⁰

176. See Kaufman, *supra* note 85. The number of smiley faces on a utility bill reflects how well the household is doing on energy conservation. Thus, high performance earns two smiley faces; while good performance earns one. *Id.*

177. Another example of positive labeling is the "I voted" stickers that inform others of the wearer's good civic behavior.

178. Cf. Carlson, *supra* note 15, at 1294 ("The visibility of returning recyclable containers also provides people with good reputation-signaling or esteem-enhancing opportunities.").

179. Cf. Vandenbergh, *Beyond Elegance*, *supra* note 16, at 116 (commenting on the effectiveness of programs that reward regulated entities for complying with environmental regulatory requirements and that publishing the number of complying companies can create an impression of widespread compliance); Cooter, *supra* note 159, at 19 ("To induce people to internalize values, the state must reward citizens for having civic virtue. For this purpose, officials bestow honors, awards, and praise, as well as their opposites (dishonor, punishments, and condemnations).").

180. See Carlson, *supra* note 15, at 1232 ("Recyclers get either intrinsic satisfaction for doing the right thing, approval from friends and neighbors for their environmentally correct behavior, or both."); Fishman, *supra* note 40, at 76 ("Buying and using [a CFL] helps save the world—and also saves the customer money—with no compromise on quality. Selflessness and self-satisfaction, twirled into a single \$3 purchase."); Walmart Fact Sheets, *supra* note 31. *But see* Richard A. Posner, *Social Norms, Social Meaning, and Economic Analysis of Law: A Comment*, 27 J. LEGAL STUD. 553, 560 (1998) ("I do not myself believe that many people do things because they think they are the right thing to do unless they have first used the plasticity of moral reasoning to align the 'right'

As discussed previously, both the esteem of others and self-esteem are important motivators of good behavior.¹⁸¹ But when the source of that esteem is withdrawn (no more smiley faces), or is only a one-shot event (the bumper sticker), then, as in the case of economic incentives, the individual may not repeat the environmentally responsible behavior (buying CFLs).¹⁸² Indeed, in the case of bumper stickers or public lists, the temptation to free ride on her one-time good behavior might be strong enough to allow an individual's prior irresponsible behavior to return. Additionally, studies show that the effectiveness of non-monetary rewards at influencing individual behavior is limited to circumstances where the new behavior is of low to moderate cost, and where there is a community norm favoring the new behavior;¹⁸³ neither of which may be true in the case of CFLs.

The negative attributes of economic incentives, and the motivational uncertainty of both economic and non-economic incentives, put into question their effectiveness as motivational tools to persuade individuals to consume less electricity, let alone their ability to overcome the reluctance of people to buy CFLs despite their individual and social benefits.

D. What Will It Take to Make the "Horse" Buy a CFL?

Each of the motivational tools underlying the initiatives set forth in this Article—smart meters, comparative billing, and personal incentives—has drawbacks. This Article suggests that none is sufficient by itself to overcome the barriers to making individuals conform to the norm of energy conservation by purchasing a CFL—a conclusion that is consistent with my prior work in this area. However, it may not be enough simply to aggregate these persuasive techniques or tailor them to the target audience, as I previously suggested with respect to getting people to internalize a new norm of individual environmental

with their self-interest. I do not think that knowledge of what is morally right is motivational in any serious sense for anyone except a handful of saints . . . [I]n general[,] you need to appeal to a person's altruism, fear, or pride (sometimes moral pride, which is not to be confused with morality) to explain non-self-interested behavior.”)

181. See *supra* notes 125-36 and accompanying text; see also *supra* notes 175-79 and accompanying text.

182. Whether such an individual will feel guilty for her behavior, which, in turn, might motivate her not to free ride, is open to question. See ERIC A. POSNER, LAW AND SOCIAL NORMS 43 (2000) (“[N]o well-developed theory of guilt allows us to make predictions about when [it will be influential] or what kinds of people feel guilt and what kinds of people do not. So . . . we cannot rely on a theory of guilt for an explanation.”).

183. Stern, *supra* note 34, at 563.

responsibility and improve their environmental behavior.¹⁸⁴

Instead, for individuals to entertain the thought of purchasing a CFL, the product will have to be redesigned—its mercury content and price reduced and its attractiveness and convenience improved. This conclusion is based both on Wal-Mart's successful campaign to get its customers to buy CFLs and on the weakness of the motivational tools discussed in this Article. Once those structural—Professor Ann Carlson's "architectural"¹⁸⁵—changes to CFLs have been made, then information, comparative billing, and various economic and non-economic personal incentives can play an important role in pushing individuals to swap out their incandescent bulbs for CFLs.

Wal-Mart has launched a major campaign to get its customers to buy CFLs and has sold over 260 million of these light bulbs in two and a half years.¹⁸⁶ The box store has tackled each of the structural inhibitors to purchasing CFLs. For example, Wal-Mart has reduced the cost of CFLs by offering its own brand at a lower price.¹⁸⁷ It has also addressed the mercury problem by working with CFL manufacturers to reduce their mercury content.¹⁸⁸ Wal-Mart has taken steps to make buying CFLs easier by reconfiguring the lighting displays in its stores to draw attention to CFLs, offering interactive displays so customers can compare CFL qualities and styles, and allowing its customers to purchase CFLs online.¹⁸⁹

Wal-Mart is on the right track. By tackling the consumer barriers inhibiting the purchase of CFLs head-on and making the product something individuals want to buy, the company is having a more direct effect on the purchase of CFLs than by relying solely on a variety of behavioral incentives to motivate individuals to engage in the desired environmental behavior. The global lesson learned from the CFL story for those who seek to improve individual environmental behavior is that when the barriers to action inhere in the action itself and are not

184. Stern, *supra* note 114, at 10789 (stating that getting people to change their behavior is more complex than any single factor, especially if one is trying to influence a substantial portion of the population).

185. Carlson, *supra* note 15, at 1254.

186. Walmart Fact Sheets, *supra* note 31. Wal-Mart has also demonstrated that buying "green," when it makes good economic sense to do so, can be a powerful motivator for those at a lower economic level in our society. See Daniel Gross, *Edison's Dimming Bulbs*, NEWSWEEK, Oct. 15, 2007, at E22 ("Thus far, green goods have been pitched to the top: expensive Priuses for guilty yuppies, solar installations for rich techies. But to have real impact, energy-efficiency products need to make economic sense to those who congregate on the lower rungs of the economic ladder. Wal-Mart's sales of CFLs proves that energy-efficient goods don't have to be luxury items.").

187. Walmart, *supra* note 47.

188. *Id.*

189. *Id.*

cognitively induced, no amount of motivational inducement can overcome them until the structural obstacles preventing the individual from engaging in the good behavior are attended to.

However, this is not to say that information, the desire of individuals to conform or compete, their need for self-esteem or the esteem of others, or their receptivity to a good deal have no role in getting them to swap out their light bulbs. Even after structural changes are made to CFLs, there still needs to be a reason for an individual to get up off the couch and go buy one. It is just too early to apply these motivational tools and expect that individuals will conform to the norm of energy conservation and behave in a more environmentally responsible manner by switching light bulbs.

IV. CONCLUSION

My previous articles suggest that relying on a single persuasive tool to change individual environmental behavior will not work, but that a combination of techniques, like public education, sanctions, and market-based incentives, specifically tailored to the desired activity and the targeted audience may achieve the goal. That conclusion has not fared well in this Article, where several of these persuasive techniques have been applied to see if they could motivate individuals to swap out their light bulbs, even though doing that conforms to the norm of energy conservation and is the environmentally responsible thing to do. The conclusion that these motivational tools will not work alone or in the aggregate when the inhibitors to behavioral change inhere in the product or activity itself, while a surprise to me, seems intuitively correct. It is also a conclusion that Professor Ann Carlson's work on recycling supports where she says architectural changes—that is changes in how people recycle—are more important than norms or incentives in getting people to recycle.¹⁹⁰

This does not mean that norms, like the energy conservation norm, play no role in influencing individual behavior. They do play a role. However, this Article shows that that role is more limited than I originally thought. Norms cannot direct how they will be implemented, especially when the barriers to norm implementation inhere in the desired behavior. Wal-Mart's campaign demonstrates that until the physical impediments to buying CFLs are removed, neither norms nor persuasive techniques have the strength to overcome the general barriers to good environmental behavior, let alone the structural barriers to purchasing CFLs. Therefore, norms not only require the assistance of

190. See generally Carlson, *supra* note 15.

external motivators to change behavior, as my prior work concluded, but to be effective they must also operate on a level playing field where the obstacles to good environmental behavior have been removed.