Product Carbon Footprint Labels and theProspects for Informational Governance[1]

Steve Vanderheiden, University of Colorado at Boulder[2]

Reliable information concerning the extrinsic qualities of consumer products, along with reporting requirements for large-scale polluters and resource users, are often viewed as necessary conditions for ensuring accountability with sustainability imperatives (Stephan 2003; Fung *et al*. 2007; Auld & Gulbrandsen 2010). The gathering and dissemination of information concerning releases of harmful pollutants and production of waste makes possible conventional "command and control" anti-pollution regulation, and data tracking the use by various parties of scarce environmental goods or services like water, energy, or greenhouse gas emissions absorptive capacity enables their more sustainable and equitable allocation (Hayward 2006; Ramkumar & Petkova 2007; Vanderheiden 2009), though in neither case does pertinent information and transparency provide sufficient conditions for realizing these objectives. Regulatory approaches to pollution control rely upon such information to track compliance with permitted emissions, with permits and fines or other legal sanctions for noncompliance as their primary enforcement mechanisms. Natural resource allocation systems are either aspirational but not legally binding, as in calls for more equitable carbon footprints (Wackernagel & Rees 1996; Vanderheiden 2008), or else take the form of pollution-control regulations, permitting various users finite access to environmental goods and services and wielding conventional policy mechanisms for their enforcement. In either case, information provides an external assist to the primary regulatory tool, whether normative or incentive-based, but does not itself motivate behavioral change.

Neither takes the form of what Mol (2008) terms "informational governance," relying upon incentives internal to the environmental information and transparency system, resting instead upon the conformity between external standards and what information shows about a party's conformity with them. Information concerning environmental impacts of firms or products can assist state regulators in managing resources and protecting the environment, but how much can information disclosure and transparency accomplish on their own, either through the conditioning effects upon firms of disclosure requirements or mobilizing effects upon

---

[1] Prepared for delivery at the 2013 Western Political Science Association annual meeting, to be held March 28-30 in Hollywood, CA. Comments welcome, but please do not quote without permission.

[2] Political Science Department, Ketchum 106, 333 UCB, Boulder, CO, 80309-0333,, vanders@colorado.edu.

consumers of transparency systems? The information turn in environmental politics suggests greater transformative potential of information and transparency on its own, absent externally-imposed regulatory standards or policy-based enforcement mechanisms. Here, I shall assess the prospects for informational governance not merely as conditioning firms, as Mol uses the term, but also as transforming individual values and conditioning behavior through the collection and dissemination of information. To this end, I shall examine environmental disclosure and transparency systems in general and the *product carbon footprint* label in particular, considering the respective strengths and shortcomings of such tools, and suggesting strategies for their potential application to environmental governance.

Why might anyone think that information gathering and dissemination programs, on the basis of their own processes or incentives and without disclosure revealing noncompliance with external standards or otherwise triggering conventional enforcement mechanisms, could affect significant change in the environmental performance of individuals, firms, or polities? Several explanations appear within environmental policy literature. Disclosure and transparency efforts have been identified as mechanisms for ensuring accountability among state and corporate actors (Grant & Keohane 2005; Keohane 2006; Gillies 2010), linked to broader trends away from secrecy in international politics (Florini 1998; Mitchell 1998), and applied to education-based efforts to improve civic competence (Mitchell 2011). Bartlett (1986) argues that the NEPA-mandated process of conducting a review and preparing and presenting an environmental impact statement (EIS) embeds *ecological rationality* (Dryzek 1983) within state decision making processes, emphasizing the benefits of procedural commitment to information-gathering over the public pressure afforded by avenues of legal appeal that EIS mandates also offer. According to Bartlett, "federal agencies were required by NEPA to improve, coordinate, consider, and recognize commitments, relationships, and environmental effects," which in effect required that they "begin using procedural ecological reasoning in their planning and decisionmaking" (107). Elsewhere referred to as *reflexive* regulation (Orts 1995) and viewed as an aspect of reflexive modernization (Beck *et al*. 2003), this form of rationality is seen as better accounting for the ecological constraints upon and effects of state action. While Bartlett focuses upon the internal dynamics of information gathering and reporting requirements, as agencies are required to take into account additional impacts or their decisions and so recognize new values in the calculus by which those decisions are reached, others (Boström & Klintman 2008; Doran 2009) have focused

upon how information and transparency requirements affect individual and firm behavior as the information is mediated by other actors.

Because the public dissemination of information allows outside parties to hold polluters or resource users accountable for their environmental performance beyond what the law requires, Mol (2010, 135) suggests that "transparency relates directly to power as it aims to democratize information and empower the powerless by providing them with one of the most powerful resources in current times: access to and control over information and knowledge." This thesis concerning the empowering effects of information supposes that members of the public may be more likely and better able to challenge polluters either directly through consumer boycotts or other shaming actions (Stephan 2003), or indirectly by pressuring state regulators to enact stricter pollution controls (Cohen & Santakumar 2007). Beyond the potential empowerment of external stakeholders to hold polluters accountable (Fox 2007), Orts (1995) suggests that transparency can create incentive structures favorable to environmental performance-driven innovation through which firms can derive reputational benefits. As he notes of such systems:

> They attempt to provide positive incentives for businesses to improve environmental performance in order to appeal to the environmental preferences of citizens. Product reengineering, creative approaches to manufacturing and production, and the invention of new technology are encouraged. The rub is that consumers must actually care enough about the natural environment to pay an additional premium that will provide sufficient incentive for business to invest in making environmentally correct products (784-85).

By publicizing certain kinds of environmental information, whether through pollution reporting programs or product labels, informational approaches create winners and losers, with those firms and products portrayed favorably by the evaluative standards being used receiving good publicity and potentially also a market boost as a result. As Orts notes and as shall be further considered below, these incentives depend upon latent public demand for environmental quality along with consumer preferences for products that perform well by the indicators in question.

Publicizing pollution data: EPA's Toxics Release Inventory

Perhaps the informational program most lauded for empowering affected members of the public and creating incentives for industry to improve its environmental performance is EPA's Toxics Release Inventory (TRI), which places online a searchable database of toxic chemicals released by industry and federal agencies, including mapping functions that allow users to view

pollution sources by geographic area (Antweiler & Harrison 2003; Hamilton 2005). Fung and O'Rourke (2000, 123) commend this pollution disclosure program for "the ease with which a variety of users—ordinary citizens, public interest groups, state agencies, journalists, and those in industry—can use its data to quickly and easily rank industrial facilities along a rough dimension of environmental performance." Similarly, Sabel, Fung, and Karkkainen (1999, 6) laud the TRI among alternative regulatory strategies, suggesting that:

> the collection and publication of TRI data immediately disciplines polluting private actors. Public comparisons of polluters compiled by journalists or community activists from TRI data also lead to significant declines in the share value of publicly traded firms that show poorly. These reputational and financial market penalties give managers strong incentives to either reduce their toxics emissions or shade their reporting estimates to appear cleaner than they are.

As a community "right to know" provision, the TRI's online database of data concerning local releases of toxics is thought to empower stakeholders in addition to informing them, and to create an incentive structure through which performance beyond that mandated by existing state regulation confers additional reputational benefits. Presumably, this empowerment mobilizes existing concerns for personal safety on behalf of meaningful exercises in public control over sources or repositories of pollution, clarifying if not creating environmental values.

Fung, who co-directs the Transparency Policy Project,[3] has more recently backed away from this more optimistic assessment of TRI's potential for public empowerment, but remains convinced of the programs potential benefits. Writing later with Weil, Graham, and Fagotto (2006, 171), he notes that some firms as "sought to reduce their emissions by engaging in pollution prevention strategies while others substituted chemicals or changes accounting practices in ways that improved reports without necessarily improving public health." Although not discounting its empowerment and disciplining potential altogether, the authors here place TRI in a middle category of disclosure programs, which are "insufficient to generate effective policy outcomes but can be made to work in tandem with other government actions to embed information in action cycles that produce congruent behaviors by disclosers" (175). Existing evidence on market responses to TRI data, they note, do not show that the system's reporting requirements have had significant effects on local residential patterns or community action, suggesting that members of the public "do not consider toxic releases when they decide what

3. http://www.transparencypolicy.net/.

neighborhood to live in, where to send their children to school, where to work, or in what company to buy stock," and thus that TRI's effectiveness "has been more limited than it appears" (171). Nonetheless, they found that some firms were led to take proactive pollution-control measures in order to protect their reputations and avoid anticipated regulatory threats, with federal regulators increasingly responsive to the new information.

A key claim of "informational governance" advocates concerns the citizen empowerment potential of disclosure and transparency programs like TRI, which supposes that this information will prepare and motivate affected persons and communities to exert pressure on bad performers to improve their pollution records (Stephan 2003; Fox 2007; Mol 2010). This "empowerment thesis" is explicitly invoked on Green Media Toolshed's *Scorecard* website,[4] which combines TRI data with information on potential health hazards for toxic chemicals, along with several EPA Superfund databases, EPA's Air Quality System and National Emissions Trends databases for tracking airborne smog and particulates, its National-Scale Air Toxics Assessment for hazardous air pollutants, three EPA databases tracking water pollution, and animal population numbers from the Department of Agriculture combined with waste factor data to estimate animal waste. The website provides local information on local environmental quality and known hazards by zip code, suggesting that local residents research their town or neighborhood and "then take action as an informed citizen - you can fax a polluting company, contact your elected representatives, or get involved in your community." Although much of Scorecard's data is now out of date, this call to citizen activism should at least be bolstered by the wide variety of information that local residents can through this centralized clearinghouse readily access, even if relatively few have thus far taken advantage of it.

As Dingwerth and Eichinger (2010) find, however, the links between environmental disclosure and empowerment are often overstated. In a study of the Amsterdam-based Global Reporting Initiative (GRI), which is "regarded as the world's leading voluntary scheme for corporate non-financial reporting" (76), they find little evidence that GRI's transparency efforts lead to greater civil society empowerment. While such policies "may work where information needs are limited" and "where the comprehensibility and comparability of reported information is not a major problem," they "are unlikely to work in the same way where information needs encompass a whole bundle of indicators, where the quality of data requires a higher degree of

[4] http:// scorecard.goodguide.com.

'literacy' on the side of report readers, and where issues of comparability are more complex" (91). Moreover, since those bad environmental actors threatened by disclosure and transparency programs that threaten to bring them negative public attention are most powerful where strong civil society groups that might potentially serve as a counterweight to them are absent, in such settings "the corporate sector can 'tame' transparency policies, reduce their transformative threat, and tailor the instrument to their own needs" (92). Transparency systems, that is, work best where civil society groups are already strong, which is also where they are least needed, while such systems can be readily coopted where civil society groups capable of holding bad corporate actors accountable are weak, rendering such systems least effective where they are most needed. In effect, the authors find that transparency systems empower the already-empowered, but fail to empower publics and potentially allowing polluters to hijack those systems where state regulatory capacity is also weakest, and vulnerability to environmental hazards the highest.

Aside from the paucity of evidence that online inventories of environmental hazards do in fact empower citizens in the way that advocates often claim, the increased access to information can have downside consequences in terms of the reactions that it induces, at least with regard to one kind of disclosure and transparency program (Langley 2001). Informational approaches like the TRI stress exposure risks, disseminating data about local environmental hazards, and so convey the dual message that one is vulnerable to harm from local sources of pollution but also potentially more empowered to minimize that vulnerability by virtue of knowing about it. Critics have questioned these claimed empowerment effects, however. Etzioni (2010) argues that environmental regulations have an "expressive function" in declaring community norms against important hazards by controlling their causes, whereas non-binding transparency rules imply that the threat in question is "less consequential than if the activities or products at issue are banned or their provision is required" (15). Similarly, Szasz notes (2007, 2-3, 4) that, far from actually empowering citizens toward collective political action to minimize risks from local sources of environmental hazards, information about environmental risks like that disseminated through TRI often generate a potentially disempowering and depoliticizing reception in many.

> There is awareness of hazard, a feeling of vulnerability, of being at risk. That feeling, however, does not lead to political action aimed at reducing the amounts or variety of toxics present in the environment. It leads, instead, to individualized acts of self-protection, to just keep trying to keep those contaminants out of one's body… A person who, say, drinks bottled water or uses natural deodorant or buys only clothing made out of natural fiber is not trying to change anything. All they

> are doing is trying to barricade themselves, individually, from toxic threat, trying to shield themselves from it. Act jointly with others? Try to change things? Make history? No, no. I'll deal with it individually. I'll just *shop* my way out of trouble.

If the environmental impacts that persons are informed about concerns risks to which they may be exposed by virtue of some of their choices, such as where to live and work, their reaction may be to adopt a defensive posture with regard to other choices that they might more readily alter, such as what to eat, drink, or wear. As Szasz notes, this defensive reaction is apolitical and not very constructive, but it also reinforces an inward-focused orientation in which environmental information erodes the normative commitment to sustainability upon which the most promising informational approaches depend. So long as persons are first and foremost concerned about protecting *themselves* rather than the *environment*, where commitment to the latter supposes a concern for whole systems and their impacts on others, this reaction is anathema to sustainable behavior, and indeed concerns for sustainability are nowhere present in Szasz's account.

Eco-labels as markers of extrinsic performance

But there is another kind of information that at least in principle might be able to yield the sort of socially-oriented concern for sustainability that is needed for such approaches to rival regulatory ones in their effects. The reaction that Szasz describes might follow from fear of the intrinsic effects of certain consumer goods, like "pink slime" in ground beef or bovine growth hormone in dairy products, prompting consumers hearing about such additives to seek out "natural" or other putatively safer alternatives, or from general knowledge about other nearby sources of contamination, provoking this defensive reaction that manifests in actions over which persons have some control. However, one would expect a quite different reaction to information about more widely distributed extrinsic effects that result from the manufacture, use, or disposal of the products we consume—about our *global* rather than very localized environmental impacts. Information about the first kind of effects, Szasz argues, often lead fearful consumers to behavior that he describes as an "inverted quarantine" for its "processes of separation and containment to keep healthy individuals away from disease agents" (4-5) even if irrationally directed against the pervasive and insidious risks that Beck (1992) characterizes as part of "risk society" and against which such defensive postures are ineffective. Insofar as disclosure and transparency programs reveal the extent to which persons are vulnerable to harm from pollution and contamination, even if also hypothetically empowering then to minimize their vulnerability through this

knowledge, the self-oriented and defensive reaction that induces follows from the message they contain, which stresses personal vulnerability and calls attention to personal threats. Information of this second kind draws attention in another direction, stressing social rather than personal risks from certain kinds of products or activities, cast in terms of social or environmental costs to one's polity or the larger world, while identifying negligible personal impacts and offering no reason to modify one's behavior from strictly selfish motives.

The latter kind of information can be conveyed through eco-labels, which focus on social and environmental impacts and so convey information about the extrinsic effects of various consumer options, most of which have no discernible impact on the consumer purchasing them other than the kinds of reputational or status benefits that such consumption entails (Kaiser & Edwards-Jones 2006; Boström & Klintman 2008). Buying Fair Trade[5] or organic coffee rather than uncertified alternatives promises no personal benefit to the consumer, either in terms of better taste or lower personal risks associated with consuming the product.[6] Rather, it promises better working conditions for growers and pickers, and better prices paid to both, along with (with organic certification) reduction in local impacts from sludge or synthetic chemicals used as fertilizers or pesticides. Whereas the first kind of information primarily appeals to personal fears about safety against exposure to sources of environmental risk, eco-labels appeal to ecological or altruistic concerns for environmental sustainability and social justice, neither of which reduces to personal impacts on the consumer seeking out products that meet relevant certification standards (Stolle *et al*. 2005; Gupta 2010). Given the other-affecting nature of the impacts that they highlight, eco-labels should not mobilize the response that Szasz describes, but should rather appeal to those for whom such impersonal effects are important. In other words, the value of eco-labels to consumers depend upon the prior existence of a kind of environmental values or preference for environmental protection beyond that which can be grounded in self-interest, combined with the reliability of and trust in the information being provided on the label (Vogel 2005; Doran 2009). Whether than same information can help to awaken or construct such a conscience, on the other hand, is another question altogether. Preferences for credence goods may not arise through information about "sustainable" or "ethical" options alone, but may instead originate elsewhere in latent form, waiting to be mobilized through informational labels.

[5] http://www.fairtradeusa.org/.

[6] One exception is the USDA Organic certification's pesticide restrictions, which make it something of a hybrid extrinsic/intrinsic label insofar as pesticide residue can affect the health of the consumer.

Separating the two would be a difficult task. Consumer preferences are notoriously messy, since they result from a wide array of sources and are typically grounded in non-rational messages and associations (Schor 1999; Lasn 2000). Identifying the relative weights of the various considerations that go into consumer preference formation is far from straightforward, even for the consumer herself. When I buy Fair Trade coffee at the supermarket, I don't know how much of my preference for this choice is based upon altruistic concern for those living or working along the product's supply chain and thus presumably benefitting from the demands of this certification system, how much reflects a kind of political endorsement of the Fair Trade program that I view myself as supporting even if my single purchase has no discernible effects on anyone, how much is based instead on reputational or peer pressure exerted by others or imagined by me as I browse the shelves at my local Whole Foods, and how much is the result of "nudges" (Thaler & Sunstein 2009) provided by product placement within the store or packaging and other marketing efforts by the producer or retailer. Nonetheless, self-oriented and altruistic motives operate side-by-side in much consumer behavior, with the latter potentially assisted by transparency efforts, even if consumer values are not made more other-regarding by them.

If I'm at a loss to determine what made the difference in my decision to buy a Fair Trade over a socially and/or environmentally worse alternative, or even whether the label itself made any difference in my consumer choice, as I am, it may be too optimistic to expect a precise accounting of the role of information in the consumer behavior of others. That I believe myself to have at least some latent concern for the social and environmental impacts of my actions and choices—a concern that is sometimes but not always activated as a motive in my behavior—does not in itself account for the origin of this concern. While it may *reinforce* my environmental and social values that they occasionally manifest in trips to the grocery store through such consumer behavior, I doubt that the occasional opportunities to act on my social or environmental values could also be what caused me to have those values in the first place. At best, such opportunities might reinforce my preferences by yielding a sense of personal empowerment to advance them through mundane actions like shopping (whether or not grounded in reality); at worst, they might co-opt and depoliticize those preferences, undermining any sense of personal efficacy that better consumer options provide by steering me away from any potentially effective forms of collective action. But in neither case can the information that I used to mobilize my values or to advance my preferences serve as their source, since without at least some latent concern for the larger

world at the outset, that information would be of little use to me, having no purchase on my core values or commitments. I can be neither empowered nor disempowered to act on motives or preferences that I don't presently hold, as appeals to them are not appeals to me.

Nevertheless, there is some evidence that allows for at least a cursory analysis of the manner in which such preferences may be mobilized or reinforced through consumer behavior (Biel *et al*. 2005; Devinney *et al*. 2010), and that evidence is not encouraging for informational approaches like eco-labels if expected to serve as the source or instrument of environmental values. Market research evidence shows that self-identified "green" consumers are often surprisingly uninformed about the very concerns that their preference for credence goods suggests (Vogel 2005). A 2009 study of 30,000 consumers identified as among the 77 percent of the U.S. population reporting that they at least sometimes purchased products because of their promise to be "green" found that nearly half (49%) thought that carbon dioxide was responsible for depleting the ozone layer rather than causing climate change.[7] At minimum, the hypothesis that better informed consumers might alter their behavior in environmentally or socially beneficial ways depends upon their actually being informed about the basic causal links between their choices and the outcomes that they putatively prefer, not mistaken or misled about them. It does little good to embed carbon footprint data in commodity UPC labels if motivated "green" consumers with access to that data don't appreciate any causal link between it and their supposed desire to personally mitigate climate change. While eco-labels can be "dumbed down" to signal motivated and concerned but uninformed consumers—perhaps including a single numerical score that is noted to correspond to some reputable index that they could find out more about if they wanted, combined with guidance that a lower number is better—the more they are simplified in this way, the less they remain connected to the specific social and environmental concerns that are thought to motivate them in the first place. This is not to say that such composite labels cannot be effective in transforming consumer behavior—and there is good reason to prefer one or a small number of readily comparable ratings over a complicated set of comprehensive but incommensurable data if meaningful choice between rival goods is the goal—but simplified presentation of data comes at the expense of severing the information being presented from the impacts it represents, and thus the reasons we having for caring about it.

[7] http://www.sheltongroupinc.com/press/greenlivingpulse/press_releases/GreenLivingPulseNewsRelease.pdf.

In addition to revealing that many putatively "green" consumers are not well informed about the problems that supposedly motivate their preferences, market research evidence also suggests that their preferences for "green" products are not very robust. As Vogel notes (2005, 48-49), market research shows that people "will only buy a greener product [if] it doesn't cost more, comes from a brand they know and trust, can be purchased at stores where they already shop, doesn't require a significant change in habits to use, and has the same level of quality, performance, and endurance as the less-green alternative." Similarly, Levi and Linton (2003) characterize "green" or "ethical" consumerism as maintaining that "purchasing power is used to promote moral ends, goals that serve the material interests of others often at a cost (albeit sometimes relatively minor) to the consumer" (407), where the goal is to change behavior "by transforming individual tastes and preferences" and inculcating "the norm that people in prosperous countries should factor global social justice into their buying decisions" (419). In a study of Fair Trade coffee, however, they find that few consumers are willing to buy certified beans unless they also taste good, and then are only willing to pay a small premium for the credence good that certification represents. If the extrinsic social and environmental effects of Fair Trade certification efforts constitute the basis for standalone reasons for consuming one product rather than another, they suggest, the value of the credence good that certification provides is relatively small. Nonetheless, demand for goods labelled as Fair Trade or by other existing certification systems suggests the potential for such informational approaches, particularly as these can serve several purposes at once with labelling schemes that collect and disseminate a variety of environmental information.

New directions in eco-labels

In this section, several informational efforts designed to motivate or facilitate "green" or "ethical" consumption shall be examined, viewing each as a potential model for informational approaches to encouraging responsibility for climate change through consumer behavior. First, however, it is worth noting a key critique of the notion that information and consumer-oriented approaches alone offer any solution to problems associated with high current consumption rates. In remaining committed to a form of consumerism (Luke 1998), albeit one that urges marginally beneficial qualitative shifts in consumption patterns, efforts to voluntarily and qualitatively shift consumer behavior toward marginally better options cannot effectively address the many

quantitative problems of consumption. The problem, according to this view (Schor 1999; Princen 2005; Zehner 2012), is *how much* we consume, not *which* particular commodities we buy. Merely inducing persons to purchase a green product rather than a brown one—even if these descriptions are accurate, which remains another serious problem with voluntary and even mandatory disclosure and transparency schemes—does little to curb the stresses on ecological systems posed by unsustainable rates of resource depletion and pollution, both of which are largely based in quantitative consumption rates. Ethical or green consumption is necessarily less overall consumption, this critique maintains, and in the case of the affluent consumers who are most receptive to green marketing campaigns, this means consuming much less than they do at present. No product label conveys this message, which is at odds with those pushing green forms of consumption. Since it involves significantly scaled-back consumer expectations and indeed the imposition of restrictions on consumption beyond those likely to gain the voluntary assent of a sufficiently wide demographic, it challenges rather than acceding to prevailing consumerist norms. Moreover, the medium of the eco-label, with its objective of translating claimed social or environmental virtues into greater market share, is obviously incompatible with the message that declining overall consumption may be needed.

The critic of voluntary consumer-based efforts is surely right in suggesting that serious global problems like climate change cannot be effectively addressed through such voluntary measures alone, but the defender of the informational approaches on which green consumerism depends can concede this point without abandoning the transparency project altogether. So long as it is treated as merely one mechanism among several for encouraging persons to behave more responsibly in the context of climate change or other social or environmental consequences of current consumption patterns, opposition to regulatory measures is not a necessary feature of the defense of voluntary ones. The relevant question is not whether or not green consumerism offers a fully adequate substitute for effective regulatory measures, which it does not, but whether it can effectively complement such measures by affecting personal values and behavior beyond the scope of state regulation, and indeed whether such measures can be effective without the basis in public awareness and concern that enlightened consumerism manifests and information enables. Whether or not informational approaches cultivate or inculcate the sort of ecological conscience that I have suggested is essential for triggering green consumerist behavior as well as for public support of more effective regulatory programs, the approaches examined below promise to

develop a resource that is as just as useful for holding persons responsible through regulatory efforts as it is for inducing them to voluntarily take responsibility for their actions. Here, then, I shall consider how information approaches serve both regulatory and voluntary efforts at climate change mitigation, making it easier for persons to act sustainably when they are inclined to do so but also addressing the practical means by which states might encourage sustainable behavior by their citizens, and might thereby become more sustainable actors themselves.

A necessary but insufficient condition for sustainable action is access to the requisite information concerning the various effects of alternative actions. If states want to impose carbon budgets on their citizens or attach a price to carbon through taxes or trading systems, information about the carbon emissions resulting from various activities is needed in order to monitor and ensure compliance with regulatory efforts. If persons are to comply with self-imposed personal carbon allowances, they likewise need information about their current footprints and the effects on them of alternative choices so that they can make informed carbon budgeting decisions. Without it, persons cannot take responsibility or be held responsible for their carbon emissions (Vanderheiden 2011), since neither they nor any authoritative oversight body can compare their carbon footprints against carbon budgets. Behavioral change to mitigate climate change, whether voluntary or regulatory, is impossible without wide access to reliable information of the kind that can mobilize normative concerns and enable public policy measures.

What sort of information is required, and how does it work to facilitate these mechanisms of political accountability and personal responsibility? An instructive example is the food label, which can contain information about its various intrinsic or extrinsic attributes. Food labels now reveal information about a product's intrinsic nutritional properties: its ingredients, calorie and fat contents, percentage of a day's recommended dose of vitamins and minerals contained in each serving, and so on. In some cases, warnings are issued on labels, as with alcoholic beverages and pregnancy. Food labels are useful for those following strict dietary guidelines, like prohibitions upon animal products, as well as for those seeking to limit but not entirely avoid things like calories or carbohydrates. Labels that certify some combinations of intrinsic and extrinsic attributes like those identifying kosher or organic foods are both highly useful to those for whom such attributes are important and relatively uncontroversial. On the other hand, labels certifying primarily extrinsic properties like "GMO-free" foods have generated more controversy (Gupta 2010), as the result of food industry opposition to such labels and World Trade

Organization standards that view such process-based labels as constituting an illegal trade barrier. Such controversy owes in part to their potential to empower consumers to use their purchasing power to oppose processes that may not qualitatively change their food (though this remains a controversy with GMO foods) but which can have palpable effects in the world.

In the context of climate change, this kind of label denotes not an intrinsic attribute of a product that could be used to qualitatively compare it to alternatives, as with food labels, but rather its extrinsic attributes in contributing to climate change. Before considering carbon labels, several other kinds of labels for extrinsic attributes warrant examination. Since a significant part of their market appeal lies in their claim to be better than their competitors in the impacts of their manufacture, marketing, use, or disposal, products certified and marketed in this way are known as credence goods. To be effective, this certification must be credible to the consumer as well as providing pertinent information that allows consumers to make informed choices (Auger *et al*. 2003; Chatzidakis *et al*. 2007). One example of a credence good mentioned above is Fair Trade coffee, which involves a binary indicator certified by a recognized third party that beans meet specified minimum criteria, including a floor price for growers that is compatible with sustainable production, prepayment requirements for suppliers, and basic labor and environmental guidelines.[8] Critics point out that the required floor price is still quite low, that most of the added value from fair trade coffee accrues not to growers but to the relatively affluent roasters and distributors of fair trade beans, and that requirements to form cooperatives may have hurt some growers (Philpott *et al*. 2007; Utterling 2009; Jaffee 2012. Since large corporations like Folger's and McDonald's have used their buying power to eliminate middlemen and so gain fair trade status for their coffee, critics worry about the effects on small suppliers of this dilution of fair trade status, and in response have proposed expanding the binary certification with a tiered system that recognizes varying levels of support for growers or commitments to sustainable processes. These shortcomings might potentially be rectified by replacing binary labels with quantitative and comparative ones, as shall be considered next, while maintaining the credence good feature of fair trade.

Whereas binary certification schemes like Fair Trade, the anti-sweatshop No Sweat, and more process-oriented organic labels make no distinctions among products earning the label and

[8] For a complete list of fair trade certification standards from the Fairtrade Labeling Organizations International (FLO), see: http://www.fairtrade.net/standards.html.

provide no information at all concerning products that lack any label—although the USDA's Organic label does offer three levels of certification for products made with 70 percent, 95 percent, and 100 percent organic ingredients—proposals for linear and more universal labeling schemes provide instructive examples for applications to climate. Few such schemes have yet been fully operationalized for informing consumers about the extrinsic attributes of products, but one offers a useful example. GoodGuide, with its database of product impacts reported through composite scores for the relative Health, Environment, and Society impacts of thousands of consumer products, provides just such a linear informational system. Using a 10 point scale for three categories of ratings and with a smart phone app that allows consumers to instantly retrieve scores with a UPC bar reader, GoodGuide mirrors the sort of accessible and usable information that could also be used to evaluate the relative climate impacts of various consumer goods and services. Its environment score, for example, includes four categories of indicators:

> *Environmental management* indicators characterize overall corporate governance, the policies and practices a company has adopted (including their applicability to its supply chain), a company's compliance record and involvement in controversies, and whether a company is engaged in any exemplary practices. *Transparency* indicators track whether the information needed to assess environmental issues is made available by a company. *Resource use* indicators track natural resource inputs used by a company to manufacture products, including materials, water, and energy. *Environmental impact* indicators track the outputs of a company's manufacturing processes, including whether a company's emissions or production practices are contributing to global warming, creating air or water pollution, generating waste, or adversely affecting ecosystems or biodiversity.[9]

As a composite index-based score, consumers can relatively easily compare rival products while shopping for them, and exaggerated producer claims to social or environmental responsibility can be readily checked, providing a measure of reputational accountability as well as incentives for improving social and environmental performance.

As noted above, however, GoodGuide provides social and environmental information for companies rather than products, offering the consumer no basis for distinguishing between products from the same manufacturer or data on the impacts of particular products. The closest examples of existing sources of universal and linear product information can be found in food labels, which provide such data on nutritional content. Because mandatory and comprehensive

[9] http://www.goodguide.com/about/ratings.

disclosure systems, food labels allow consumers to distinguish between better and worse Kraft salad dressings or General Mills breakfast cereals, which GoodGuide cannot do, and report data for the worst performing products on various nutritional indices as well as for the best ones, which voluntary programs typically cannot do. Food labels, however, report only the intrinsic characteristics food products that consumers might want in order to advance their self-interested health preferences, not the extrinsic impacts of the growing, harvesting, processing, packaging, or transport of those food products on workers in the supply chain or the environment. They can therefore assist consumers in making some important decisions, and indeed are regarded as a valuable source of empowerment for nutritional and public health objectives, but they lack the kind of information that empowers consumers to advance social or environmental values.

However, another kind of linear and comparative label offers some extrinsic information that suggests how carbon labels or other informational approaches to encouraging low-carbon choices might work, and one proposed scheme for a similarly linear reporting system on the extrinsic effects of consumer products promise benefits similar to those that might be available through a carbon label. Energy efficiency labels, in which new appliances are required to show not only their average annual energy consumption but also the costs of that energy use at average rates and comparisons with the mean and range of alternative models, allow for easy comparison among models in terms of energy efficiency, and provide consumers with useful and accessible information about where a particular model falls within a range of similar products. Efficient appliances are not credence goods, since efficiency is an intrinsic attribute as well as one that drives extrinsic effects, but efficiency labels allow for differentiation between models on the basis of their relative environmental impacts along with their costs to own and operate, and so provide an instructive partial model for carbon labels. By presenting carbon counts in the same way, consumers could potentially compare a wide range of products to each other, generating incentives for manufacturers to decarbonize their product lines, and more clearly see how their various consumption preferences affect their carbon footprints.

Perhaps the closest parallel to a climate or carbon label is the water footprint—also known as virtual water, hidden water, and embedded water—which measures the volume of freshwater resources used to produce various consumer goods and which might potentially be able to disseminate such information through product labels. The concept of virtual water was created by 2008 Stockholm Water Prize recipient J.A. Allan, who describes the analysis of water

embodied within various consumer goods as offering a "problemshed" that can help to "address the problems of a local watershed with limited water resources" (2005, 185). As he notes:

> The powerful insight of the problemshed forces us to shift the analysis from a hydro-centric focus to a comprehensive approach embracing the political economy and other relationships that are part of operational water allocation and use. The solution provided by the economically invisible and politically silent water, food and trade nexus solves the water-resource problem so spectacularly that the long-time players such as water policy makers – forgiveably – and academic analysts – unforgiveably – can pretend that familiar and reassuring discourses are still relevant.

As an indicator, virtual water's value is informational, revealing the comparative water impacts of various food commodities and consumer goods rather than issuing any binding efficiency rules or allocation principles, but information concerning extrinsic attributes like a product's water use empowers consumers as well as bigger user groups to more effectively conserve scarce resources by differentiating between more and less sustainable alternatives. Or as the FAQ from the Water Footprint Network maintains, "Good information about water footprints of communities and businesses will help to understand how we can achieve a more sustainable and equitable use of fresh water."[10] Despite the numerous and difficult obstacles to overcome before an accurate and credible water footprint label could be widely deployed, its mobilization of information and appeal to latent social and environmental values compares to what climate or carbon labels might do, and its demand-side focus likewise assists in both voluntary conservation efforts and monitoring of and compliance with regulatory standards.

Product carbon footprint (or PCF) labels can potentially influence consumer choices or inform institutional purchasing decisions by revealing comparative information about a given product's impact on climate change, but can potentially also be a valuable diagnostic tool in encouraging firms to conduct life-cycle analyses that identify efficiencies in their supply chains. As Vandenberg, Dietz, and Stern observe:

> Labelling also may induce firms to reduce their emissions in ways that lower their costs, enhance their reputations and make them more supportive of governmental policy measures that reinforce their emissions-reducing actions. This easily overlooked effect of carbon labelling will occur to the extent that firms respond to generalized concerns about brand reputation even if consumers only demonstrate limited willingness to pay for lower-carbon goods. Indeed, it seems that many firms have overlooked supply-chain efficiencies, and are not acting on substantial

[10] http://www.waterfootprint.org.

> opportunities to cut costs and reduce emissions. Developing the data to underpin carbon labelling can identify and highlight these potential savings and spur changes in production and distribution throughout the supply chain; an effect that may be a more potent incentive than the immediate impacts of consumer choices. Industries have responded similarly in the past. (2011, 5)

As with other forms of life-cycle analysis, such as ISO-14000 certification of environmental management systems, the procedural requirement entailed by such disclosure programs involve an initial cost but can be partly justified by the economic benefits to the firm of potential for realizing efficiency gains in reducing materials or energy use or waste production, combined with the reputational and environmental benefits of successfully pursuing these. Notably, only some of these benefits depend upon consumers being willing to pay more for green products.

Beyond these conditioning effects upon firms, however, perhaps the most promising element of PCF systems concerns the effect upon norms of transparent environmental impacts. As Vandenbergh and Steinemann note of carbon neutrality pledges, which are voluntarily taken by persons or groups but facilitated by carbon footprint calculators, the goal of achieving carbon neutrality (which requires one's personal carbon emissions to be balanced by offsets) "enables individuals to take personal responsibility for their contributions to climate change without reliance on uncertain or shifting estimates of the necessary reductions or of others' behavior" (2007, 1720). Apart from encouraging such voluntary efforts at decarbonization, along with allowing more robust measurement of progress toward carbon neutrality goals, Vandenbergh and Steinemann suggest that PCF systems also provide "information that activates norms may be necessary for more traditional regulatory schemes to be politically viable" (1726). In fostering an ethos of what Dobson describes as a "thick cosmopolitanism," which he describes as "identifying relationships of causal responsibility" that "trigger stronger senses of obligation than higher-level ethical appeals can do" (2006, 182), PCF labels and the personal carbon accounting they encourage can not only promote greater ethical concern or reflection, improving individual behavior outside of any coercive policy tools that incentivize sustainability, but it can potentially also generate the necessary public support for developing supplemental policy approaches.

Carbon labels face many of the same challenges as virtual water, but include several additional conceptual and measurement difficulties. Water and carbon can both be "embedded" in products on the basis of how much of each is used in their production, but in contrast to water a good's embedded carbon continues to grow well after it is initially produced. To be accurate, labels would have to continue to track a product's carbon content after its manufacture, and two

otherwise-identical products could have widely variable carbon count depending on where and how each is brought to market. Carbon is typically emitted through the product's transport and sale, but sometimes also in its use and disposal, so accurate counts would require updates after products are consumed, complicating labeling schemes. Whereas a product's water use in production is relatively direct and straightforward, and so can be more readily measured once necessary infrastructure is in place, carbon use is much less direct and spatially or temporally confined, presenting numerous accounting challenged for those seeking to assign carbon emissions to particular carbon budgets. Despite the multiple practical and conceptual challenges that such forms of life-cycle assessment face, however, their potential for promoting voluntary and monitoring and enforcing involuntary forms of responsibility is considerable. In the context of more critical informational governance, they offer the critical information needed to activate latent concerns for environmental sustainability and social justice and to mobilize consumer and citizen responsibility on behalf of climate change mitigation. While information cannot by itself motivate action, it can prompt greater reflexivity and galvanize social and environmental values that form crucial components of both voluntary and regulatory environmental protection efforts.

Conclusion: increasing the impact of information

In contrast to disclosure programs like TRI that offer stakeholders information without allowing them the agency to grant their informed consent to the exposure risks that its data might reveal or empowering them to make choices that signal their approval or disapproval of high or low levels of environmental performance, the disclosure contained within an eco-label can potentially harness the agency of concerned stakeholders to make choices that support good environmental performance. While I might not be able to readily move from what TRI reveals to be a polluted neighborhood or workplace to one with lower documented exposure risks, given the costs involved and the typical disparities in residential costs between more and less polluted localities, I can relatively easily switch my consumption patterns in response to the information disclosed through an eco-label. Bracketing the other relevant differences between these two types of informational approaches—that TRI disclosure is mandatory for many polluters and its data focuses upon potential sources of harm while eco-labels are typically voluntary and focus upon distinguishing good features that certain goods earning a certification can boast; that TRI data is linear but is presented in a manner that complicates assessment of relative risks of

different kinds and quantities of toxic substances while eco-labels are typically binary and at least promise terms by which "good enough" (if not necessarily "planet-sparing" or "best-in-class") comparative assessments can be made—this difference in the agency it invokes may suggest the greater transformative potential of the latter. For information to empower, one might conclude, it must allow for meaningful choices to be made in response to what it conveys, which in turn applies dynamic pressure upon polluters to improve their practices in order to avoid the disciplining effect of consumers exercising their exit options in a way that few residents of heavily polluted neighborhoods typically cannot.

Meaningful opportunities for agency are clearly not a sufficient condition for eco-labels to have the transformative potential described above, and here the brackets might be removed from those other differences between the two kinds of informational approaches. Most notably, eco-labels rely upon a different and less powerful set of motives for change, since their concern is not with disclosing information regarding local exposure risks, which residents may seek to avoid when evaluating their residential options or in deciding whether to move away from riskier locations, but is rather with the often distant effects of everyday choices that have no little or no discernible impact upon those empowered to choose on the basis of the information they convey. Here, agency trades off against urgency, where persons are more empowered to take the kinds of actions that matter less to them. Concern for others, including the kinds of environmental and social impacts that could be conveyed through eco-labels, and perhaps inescapably less salient to most preference orderings than is self-interest, but this need not deter inquiry into the potential for harnessing the former in the service of defensible ends as well as the latter.

Whatever else they include, one way to increase the incentive effect of eco-labels is to take a lesson from the logic of online inventories. We might ask: why do we require polluters to publicly disclose their emission records, or manufacturers the environmental impacts of their production processes? As Gupta notes (2010, 33-34), the logic is the same in both cases, even though the former is a common and widely-accepted mandate while the latter is not. Disclosure programs, she writes, have three primary purposes:

> first, a normative right to know of recipients as an end in and of itself; second, it may seek to further various procedural ends, such as enhanced participation or choice of recipients, or enhanced accountability of disclosers; and finally, disclosure may seek to further substantive ends such as environmental improvements, sustainable resource use or risk reduction.

Information about local environmental hazards and pollution sources, as is provided through programs like the TRI, can be seen as accomplishing all three of these: satisfying the "right to know" demands of an affected public whose health is putatively being protected by pollution control agencies that through this protective responsibility must keep residents informed about any known risks; holding polluters accountable by disclosure combined with the empowered resistance to excessive risks that such disclosure enables; and creating incentives for improved performance by publicly shaming bad environmental actors and implicitly commending good ones. As Gupta suggests, the logic of transparency is the same for eco-labels as it is for online inventories. Reliance upon purely voluntary eco-labels or certification programs only captures half of the reputational benefits noted above, since the voluntary nature of such systems entails that only potential beneficiaries of their reputational effects will opt in. Insofar as the public has the right to know about bad as well as good products and firms, and bad actors deserve to be held accountable or suffer reputational sanctions for their poor performance along with good actors benefitting by their better performance, labels or certification systems ought to be required of all products and firms, not merely the good ones. Eco-labels could wield the stick of bad publicity for bad performance along with the carrot of good publicity for its opposite, furthering the objectives of pollution reporting systems by allowing for pressure to be placed on polluters at the point of sale in addition to the end of pipe.

REFERENCES:

Allan, J.A. 2005. Virtual water: A strategic resource. *Ground Water* 36(4): 545-46.

Antweiler, Werner, and Kathryn Harrison. 2003. Toxic release inventories and green consumerism: Empirical evidence from Canada. *The Canadian Journal of Economics* 36(2): 495-520.

Auger, Pat, Paul Burke, Timothy M. Devinney and Jordan J. Louviere. 2003. What will consumers pay for social product features? *Journal of Business Ethics* 42(3): 281-304.

Auld, Graeme, and Lars H. Gulbrandsen. 2010. Transparency in nonstate certification: Consequences for accountability and legitimacy. *Global Environmental Politics* 10(3): 97-119.

Bartlett, Robert V. 1986. Rationality and the logic of the National Environmental Policy Act. *The Environmental Professional* 8(3): 105-11.

Beck, Ulrich. 1992. *Risk society: Toward a new modernity*. London: Sage.

Beck, Ulrich, Wolfgang Bonss and Christoph Lau. 2003. The theory of reflexive modernization: Problematic, hypotheses, and research programme. *Theory, Culture & Society* 20(2): 1-33.

Biel, Anders, Ulf Dahlstrand and Gunne Grankvist. 2005. Habitual and value-guided purchase behavior. *Ambio* 34: 360-65.
Boström, Magnus, Mikael Klintman. 2008. *Eco-standards, product labeling, and green consumerism*. New York: Palgrave Macmillan.
Brewer, Garry d> and Paul C. Stern, eds. 2005. Decision Making for the Environment: Social and Behavioral Science Research Priorities. Washington DC: The National Academies Press.
Chatzidakis, Andreas, Sally Hibbert and Andrew P. Smith. 2007. Why people don't take their concerns about fair trade to the supermarket: The role of neutralisation. *Journal of Business Ethics* 74(1): 89-100.
Cohen, Mark A. and V. Santhakumar. 2007. Information disclosure as environmental regulation: A theoretical analysis. *Environmental and Resource Economics* 37(3): 599-620.
Devinney, Timothy M., Pat Auger, and Giana M. Eckhardt. 2010. *The myth of the ethical consumer*. New York: Cambridge University Press.
Dingwerth, Klaus and Margot Eichinger. 2010. Tamed transparency: How information disclosure under the Global Reporting Initiative fails to empower. *Global Environmental Politics* 10 (3): 74-96.
Dobson, Andrew. 2006. Thick cosmopolitanism. *Political Studies* 54: 165-84.
Doran, Caroline Josephine. 2009. The role of personal values in fair trade consumption. *Journal of Business Ethics* 84(4): 549-63.
Dryzek, John S. 1983. Ecological rationality. *International Journal of Environmental Studies* 21(1): 5-10.
Etzioni, Amitai. 2010. Is transparency the best disinfectant? *Journal of Political Philosophy* 18(4): 389-404.
Florini, Ann. 1998. The end of secrecy. *Foreign Policy* 111: 50-63.
Following the footprints. *The Economist* (June 2, 2011).
Fox, Jonathan. 2007. The uncertain relationship between transparency and accountability. *Development in Practice* 17 (4-5): 663-71.
Fung, Archon, and Dara O'Rourke. 2000. Reinventing environmental regulation from the grassroots up: Explaining and expanding the success of the Toxics Release Inventory. *Environmental Management* 25 (2): 115-27.
Fung, Archon, Mary Graham and David Weil. 2007. *Full disclosure: The perils and promise of transparency*. New York: Cambridge University Press.
Gillies, Alexandra. 2010. Reputational concerns and the emergence of oil sector transparency as an international norm. *International Studies Quarterly* 54: 103-26.
Grant, Ruth W. and Robert O. Keohane. 2005. Accountability and abuses of power in world politics. *American Political Science Review* 99(1): 29-43.
Gupta, Aarti. 2010. Transparency as contested political terrain: Who knows what about the global GMO Trade and why does it matter? *Global Environmental Politics* 10 (3): 32-52.
Hamilton, James T. 2005. *Regulation through revelation: The origin, politics, and impacts of the Toxics Release Inventory program*. New York: Cambridge University Press.
Hayward, Tim. 2006. Global justice and the distribution of natural resources. *Political Studies* 54(2): 349-69.
Jaffee, Daniel. 2012. Weak coffee: Certification and co-optation in the fair trade movement. *Social Problems* 59(1): 94-116.

Kaiser, Michel J., and Gareth Edwards-Jones. 2006. The role of ecolabeling in fisheries management and conservation. *Conservation Biology* 20(2): 392-98.
Keohane, Robert O. 2006. Accountability in world politics. *Scandinavian Political Studies* 29(2): 75-87.
Langley, Paul, 2001. Transparency in the making of global environmental governance. *Global Society* 15(1): 73-92.
Lasn, Kalle. 2000. *Culture jam: How to reverse America's suicidal consumer binge – and why we must*. New York: HarperCollins.
Levi, Margaret and April Linton. 2003. Fair trade: One cup at a time? *Politics & Society* 31 (3): 407-432.
Luke, Timothy W. 1998. The (un)wise (ab)use of nature: Environmentalism as globalized consumerism. *Alternatives: Global, Local, Political* 23(2): 175-212.
Mitchell, Ronald B. 1998. Sources of transparency: Information systems in international regimes. *International Studies Quarterly* 42: 109-30.
Mitchell, Ronald B. 2011. Transparency for governance: The mechanisms and effectiveness of disclosure-based and education-based transparency policies. *Ecological Economics* 70: 1882-90.
Mol, Arthur P.J. 2008. *Environmental reform in the information age: The contours of informational governance*. New York: Cambridge University Press.
Mol, Arthur P.J. 2010. The future of transparency: Power, pitfalls, and promises. *Global Environmental Politics* 10 (3): 132-43
Orts, Eric W. 1995. A reflexive model of environmental regulation. *Business Ethics Quarterly* 5 (4): 779-94.
Peters, Joey. 2011. Could carbon labeling combat climate change? *Scientific American* (May 9, 2011), online at http://www.scientificamerican.com/article.cfm?id=could-carbon-labeling-combat-climate-change.
Philpott, S.M., P. Michier, R. Rice, and R. Greenberg. 2007. Field-testing ecological and economic benefits of coffee certification programs. *Conservation Biology* 21(4): 975-85.
Princen, Thomas. 2005. *The logic of sufficiency*. Cambridge, MA: The MIT Press.
Ramkumar, Vivek, and Elena Petkova. 2007. Transparency and environmental governance. In *The right to know: Transparency for an open world*, ed. Ann Florini, 279-308. New York: Columbia University Press.
Sabel, Charles, Archon Fung, and Bradley Karkkainen. 1999. Beyond backyard environmentalism. *Boston Review* 24 (Oct/Nov): 4-10.
Schor, Juliet. 1999. *The overspent American: Why we want what we don't need*. New York: Harper Perennial.
Stephan, Mark, 2003. Environmental information disclosure systems: They work, but why? *Social Science Quarterly* 83(1): 190-205.
Stolle, Dietlind, Marc Hooghe and Michele Micheletti. 2005. Politics in the supermarket: Political consumerism as a form of political participation. *International Political Science Review* 26(3): 245-69.
Szasz, Andrew. 2007. *Shopping our way to safety*. Minneapolis: University of Minnesota Press.
Thaler, Richard H. and Cass R. Sunstein. 2009. *Nudge: Improving decisions about health, wealth, and happiness*. New York: Penguin.
Uttling, Karla. 2009. Assessing the impact of fair trade coffee: Towards an integrative framework. *Journal of Business Ethics* 86: 127-49.

Vandenbergh, Michael and Anne Steinemann. 2007. The carbon-neutral individual. New York University Law Review 82(1673):
Vandenbergh, Michael P., Thjomas Dietz, and Paul C. Stern. 2011. *Nature Climate Change* 1, 4-6.
Vanderheiden, Steve. 2008. Two conceptions of sustainability. *Political Studies* 56(2): 435-55.
Vanderheiden, Steve. 2009. Allocating ecological space. *Journal of Social Philosophy* 40(2): 257-75.
Vanderheiden, Steve. 2011. Globalizing responsibility for climate change. *Ethics & International Affairs* 25(1): 65-84.
Vogel, David. 2005. *The market for virtue: The potential and limits of corporate social responsibility*. Washington DC: Brookings Institution Press.
Wackernagel, Mathis, and William Rees. 1996. *Our ecological footprint: Reducing human impact on the earth*. Gabriola Island, BC: New Society Publishers.
Weil, David, Archon Fung, Mary Graham, and Elena Fagotto. 2006. The effectiveness of regulatory disclosure policies. *Journal of Policy Analysis and Management* 25(1): 155-81.