

**Green Grades:**  
*The Popularity and Perceived Effectiveness of  
Information-Based Environmental Governance Strategies*

By Graham Daniel Bullock

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**Executive Summary**

**Introduction**

Initiatives that use information to catalyze collective action have proliferated dramatically in recent years, and represent a significant shift away from more traditional governance strategies, such as regulation. This dissertation analyzes this phenomenon of “*information-based governance*” in the context of the environmental arena, where non-profit organizations, government agencies, and companies have developed a wide range of product eco-labels and corporate sustainability ratings to evaluate the environmental performance of products and companies.

Between 1975, when Congress created the EnergyGuide Program to label products in 11 household categories, and today, nearly 400 environmental certifications of products, or “eco-labels,” have been introduced around the world (Big Room). These include the US Government’s ENERGY STAR label, the Forest Stewardship Council’s (FSC) wood product label, and the Green Building Council’s LEED building certification. During this same period, the number of environmental ratings of companies increased as well. Non-profit organizations such as the Natural Resource Defense Council, Greenpeace, and the Union of Concerned Scientists have issued corporate environmental ratings across a wide range of sectors, as have socially responsible investment firms such as KLD and Innovest and media outlets such as Newsweek and Fortune magazines.

This development represents a *radical shift in emphasis and strategy for these organizations*. While environmental organizations have traditionally focused on government regulation as their primary strategy, many now are dedicating their resources to initiating these information-based strategies, whether they are boycotts, eco-labels, or green ratings (Friedman 1999; Bartley 2003; Gulbrandsen 2004). In response to such efforts, corporations have engaged in similar

approaches, such as the forestry industry's Sustainable Forestry Initiative and the chemical industry's Responsible Care Program (Cashore, Auld, and Newsom 2004; King and Lenox 2000). Government agencies, recognizing the popularity and merits of these non-regulatory mechanisms, have also initiated programs to reward strong performers and provide more information to the public (Khanna and Damon 1999). The Environmental Protection Agency, for example, has over 60 such voluntary programs, including WasteWise, WaterSense, and the Green Power Partnership.

Why have some of these programs become more well-known and popular than others? This dissertation addresses this fundamental question -- *what has been driving the relative popularity of different forms of information-based governance?* It also provides answers to several related sub-questions that can improve our understanding of these initiatives:

- What theoretical frameworks are useful in describing this phenomenon?
- What are the most common and least common characteristics of these new initiatives?
- What types of these "green grades" are most and least preferred by different audiences?
- What are the most and least popular programs, and which characteristics are most closely associated with the relative popularity of these initiatives?
- What are the perceived effects and perceptions of effectiveness of these information-based efforts?

These questions are important for two primary reasons – they relate to ongoing theoretical debates within academia and ongoing practical debates across a wide range of organizations and a wide cross-section of citizens and consumers. *Relevant theoretical debates* are focused on the definition, nature, and importance of concepts such as governance, regulation, regime effectiveness, organizational trustworthiness, source credibility, issue saliency, and cognitive usability, especially as they relate to the natural environment. *Relevant practical debates* revolve around how to design effective information-based strategies, how these strategies are evaluated by consumers, policymakers, environmentalists, and company representatives, and how they can and should be utilized as an effective form of environmental management and governance.

### **Literature Review and Theory Building**

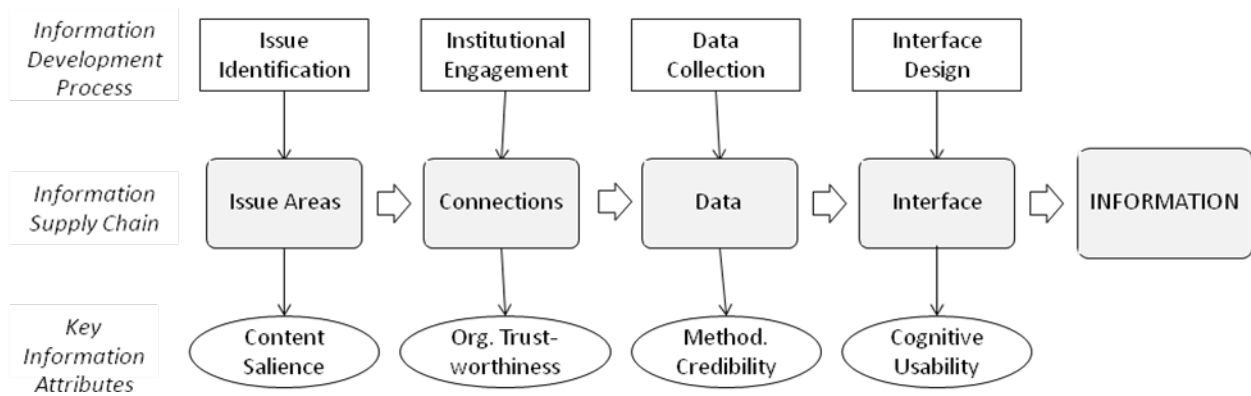
In order to develop a robust conceptual framework to address these debates and questions, I conducted an extensive review of the relevant literature. I included in this review work from both the positivist and constructivist social sciences, and made use of concepts, methods, and results from both peer-reviewed academic journals and the grey literature of consumer surveys, market analyses, and government reports. The relevant academic literature comes from the disciplines of political science, economics, management, psychology, history, sociology, philosophy, and information studies. These disciplines provide insights into the essential nature of these initiatives, and help explain what they are examples of, what they are designed to accomplish, why they are used instead of other strategies, what their essential characteristics are, and how they actually affect the environment. In particular, I build on *existing concepts of saliency, trustworthiness, credibility, and usability* from these fields to organize my hypotheses about the factors that may be driving the popularity of eco-labels and sustainability ratings.

For example, work by Meyer (2001) and Vogel (2005) suggest that labels claiming “private benefits” may make them more salient to consumers (and therefore more popular), while Magat and Viscusi (1992, 70-84) show that claims about “public benefits” can also be quite salient and may be associated with significant price premiums. Other work by Roe and Sheldon (2007) and Teisl (2003) emphasize the importance of affiliations with organizations considered to be trustworthy because most “green” products” are credence goods that are not easily verified, even after use. Conroy (2007) and others have argued that the credibility of the underlying data is also important, and can be demonstrated by greater independent verification and transparency.

Alternatively, other researchers, such as Fung, Graham, and Weil (2007), Fung and O’Rourke (2000), and Grankvist, Dahlstrand, and Biels (2004), have focused on the design and usability of the information, building on insights from Simon’s (1982) bounded rationality and Popkin’s (1991) information shortcuts research. The implication is that negative information and product information may be more usable and popular than other forms of information because they are more compatible with “users’ decision making routines” (Fung, Graham, and Weil 2007).

This research suggests that eco-labels and sustainability ratings have four primary attributes – the issue areas they cover, the organizations they are affiliated with, the data they are based on, and the interfaces through which they are delivered. I have conceptualized these attributes as being created by an “information supply chain” through four distinct processes – *issue identification*, *institutional engagement*, *data collection*, and *interface design* (see Figure 1).

**Figure 1: Information Supply Chain**



These *information supply chains* are similar to traditional commodity chains that begin with raw materials and produce final products for end consumers (Gereffi 2003), but differ in the sense that they are pulling together more intangible resources (e.g., ideas, organizations, data, delivery mechanisms) and creating a more intangible asset (i.e., information). Corresponding to each of the supply chain’s main components is a set of four basic attributes that are common to all information-based governance strategies – content salience, organizational trustworthiness, methodological credibility, and cognitive usability. These attributes encompass a wide range of more specific characteristics, and provide a theoretical framework for understanding the factors driving the popularity of these programs.

## Goals and Methods

In order to apply the insights from this literature to the questions outlined above, I had five primary goals for this dissertation. The first was *to review and present relevant theoretical perspectives* on eco-labels and green ratings from a range of different disciplines, and from this review develop a set of testable hypotheses that predict the relative popularity of these initiatives. The second was to *document the diversity of governance initiatives that evaluate product and company environmental performance in the United States*, and develop a classification scheme that systematically describes their similarities and differences. The third was to *collect data on the public's preferences* for the different types of eco-labels and ratings described in this classification scheme, and identify the types of initiatives that consumers are most and least likely to utilize. The fourth was to *collect data on the relative popularity of existing environmental certification and rating programs* in the United States, and to conduct a multiple regression analysis of this data to deductively test the above popularity hypotheses. The fifth was to *survey different perspectives on the effects and effectiveness of these programs* among consumers and organizational representatives from companies, non-profit organizations, government agencies, and academic institutions.

To accomplish these goals, I used a *mixed methods approach* utilizing both inductive and deductive strategies. This approach balanced the need to both build and test theories about this phenomenon, and made use of both quantitative and qualitative tools to collect the necessary data and conduct the relevant analyses. The *inductive, "theory-building" component* of my research included the analysis of existing empirical data and historical trends, the use of open-ended interview questions, the development of typologies and hypotheses, and the collection of relevant data unrelated to these hypotheses. The *deductive, "theory-testing" component* included the collection and analysis of data to test these specific hypotheses, using both quantitative multiple regression analysis and qualitative interview content analysis. I designed the inductive methods to build a theory of information-based governance and refine a set of preliminary descriptive concepts and predictive hypotheses, while I intended the deductive methods to begin rigorously testing this theory and its related concepts and hypotheses.

Taken together, these methods allowed me to collect several sets of data and test a range of theories about the factors driving the popularity of these initiatives. More specifically, these methods included:

**Website Coding:** I completed a rigorous process of coding the websites of 245 environmental certification and rating programs relevant to the United States marketplace. This iterative, systematic, and replicable process was based on the information supply chain framework presented above. My research assistant and I used the qualitative coding software MaxQDA to code over 2500 webpages for over 200 binary characteristics, resulting in a total of nearly 10,000 coded segments of text. This dataset is presented in Chapter 3 of the dissertation.

**Online Survey:** I conducted a survey of over 500 individuals using software provided by Sawtooth Software. The survey included questions about the respondents' demographic backgrounds, participation in "green" activities, and preferences for different types of eco-labels. The sections relating to their preferences included Adaptive Conjoint Analysis questions, Likert

scale questions, and Maximum Difference (MaxDiff) questions, each of which asked respondents to indicate the importance of different types of eco-label characteristics. The results from this survey are presented in Chapter 4.

**Popularity Data:** In order to measure the popularity of the 245 certification and rating programs in my dataset, I collected data about their websites from three web-based metrics of popularity – Google’s PageRank, SEOmoz’s MozRank, and the number of links connecting to their homepages. I then used these data to create a Website Popularity Index (WPI), which equally weights each popularity metric and is my primary measure of the popularity of these initiatives. The results are presented in Chapter 5.

**Interviews:** I conducted interviews with a stratified random sample of 70 consumers and representatives from government agencies, non-profit organizations, corporations, and academic institutions. These interviews focused on the respondents’ perceptions of the effects and effectiveness of eco-labels and sustainability ratings, and included open-ended, semi-structured, and structured (Likert scale) questions. Each lasted approximately one hour. I took extensive notes on each interview, and then coded these notes both deductively and inductively. Chapter 6 reviews and discusses these interviews in detail.

I provide detailed analyses of the data collected using each of these methods in the corresponding chapters of the dissertation. Chapter 5 brings together several of these datasets in its analysis of the characteristics that may be associated with the relative popularity of the 245 cases in my sample. In the chapter, I present a series of multiple regressions that test specific “popularity” hypotheses, using the web-based popularity data as the dependent variable, a subset of the website coding data as 18 independent variables, and the preferences data from the survey as weights in the construction of several of those variables.

## **Results and Conclusions**

The data collected on the 245 cases in the sample suggest that *climate change and energy* are their most commonly covered issues, *non-profit organizations* are their most common implementers, *government agencies* and *corporations* are their most common data sources, and *certifications* and *awards* are the most common form of the information they provide. The top two attributes preferred by the survey respondents were *independence* and *transparency*, even though a minority of the 245 cases surveyed actually displayed these characteristics. More generally, the *credibility of the data* used by these programs was more important to respondents than either the trustworthiness of the organizations or the importance of the issues covered.

The regression analysis revealed that while *popular cases showed higher levels of criteria and outcome transparency*, *they are actually less likely to use independent data*. The analysis also showed that programs that have been in existence for more than three years and are associated with non-profit organizations and government programs are also more likely to be popular, while programs that have media connections and cover pollution issues are less likely to be popular. Thus to answer my overarching research question, *it is likely that the transparency of these initiatives, their persistence over time, and their association with non-profit and governmental organizations have been driving the relative popularity of these information-based governance strategies*.

While the interview participants did not agree on an overarching definition of the effectiveness of these programs, they discussed several important dimensions of such effectiveness. The most commonly cited was *improved environmental outcomes*, while others included changes in *consumer behavior*, *corporate behavior*, and *public policy*. It was clear from these discussions that information-based initiatives can operate through *multiple effect pathways* that are not limited to consumer responsiveness. Indeed, these programs contribute to well-functioning democracies not only through the creation of specific public and private goods, but by providing information that is critical for citizens and their representatives to make wise decisions about society's priorities. Thus the accuracy of this information is critically important, and *given its overall lack of transparency and independence, efforts are necessary to increase its accountability*. The dissertation concludes with a discussion of recent developments in the field of eco-labels that represent different approaches to monitoring, governing, and improving these initiatives, as well as a range of policy recommendations for different stakeholder groups involved with these initiatives.

### **Policy Recommendations**

***Initiative Designers:*** Designers of certifications and ratings, for example, are encouraged to *clarify their goals, identify their audience, articulate their definition of effectiveness, and determine whether popularity is indeed necessary* to achieve such effectiveness. The effects pathway diagram presented in Chapter 2 can help them think through their “theory of social change” and how their program is going to contribute to the creation of specific public goods. Chapter 3 provides a helpful roadmap to the design choices you face, and Chapter 4 provides insights into what the public is looking for in these programs.

***Companies:*** For corporate representatives, it is critical that they *prioritize the types of public and private goods* they are trying to create and what their overarching goals are. If a goal of any of these information initiatives is to attract consumer attention and become popular, *going it alone as a company does not appear to be a smart strategy*. As the data described in Chapter 4 show, corporate strategies that are not transparent and do not recruit the support and assistance of advocacy groups, government agencies, and academia may have quite limited appeal. Internally-oriented programs that do not involve outside organizations may have an important role to play, but they should not be expected to be widely popular or respected.

***Activists:*** For activists, on the other hand, the results indicate *non-profit involvement* in eco-labels and green ratings does appear to have a *noticeably positive effect on their popularity*. Advocacy calls for greater transparency from corporations may also be contributing to the fact that more transparent information initiatives are also more popular. Nevertheless, overall transparency levels remain low and more emphasis on this issue is still necessary for organizations that value eco-label transparency. Likewise, independent verification is still limited, and so finding ways – such as *joint marketing campaigns, pooling of resources, or sharing of monitoring mechanisms* – to make it more cost-effective is a high priority. In terms of identifying future areas of attention, Chapter 3 can help advocates *analyze gaps in the coverage of specific issues and product categories*.

***Policymakers:*** The involvement of government agencies is also associated with higher levels of popularity, and so *continuing such involvement may be a smart strategy*. Understanding that

involvement, however, in the broader context of the agency's mandate, the information needs of the public, and other forms of governance is critical to fully evaluating the government's role in this space. In particular, *tracking both the catalytic and depressive effects of government-provided information* on regulations, technology innovation, and other government initiatives should be a priority. Such tracking can help resolve the question of whether these programs serve as ceilings or floors of performance over time. Policymakers should also consider proposals for how to *make the marketplace of eco-labels more transparent, more accountable, and more functional*. If designed correctly, such a functional marketplace can enable competition to occur that orients them towards the broader purpose of good governance – mobilizing collective action to create public goods and deliver environmental outcomes.

**Researchers:** The dissertation suggests two primary recommendations for academic researchers. The first is that even though many of these initiatives have been studied extensively in the past, a large number of them have not. *More research on these programs*, both individually and in the context of other initiatives, and on any one of the 100+ characteristics documented in Chapter 3 would yield interesting results. The second recommendation is that there is indeed a *demand for more academic research not only on eco-labels and ratings themselves but on the companies and products they evaluate*. Academic leadership, connections, and data were the three most preferred organizational affiliations in the survey summarized in Chapter 4 – more preferred than any of the possible affiliations with government, non-profit, media, or rated organizations. Researchers should therefore consider ways to effectively conduct and disseminate such research that leverages their high levels of credibility and expertise.

**Consumers:** For consumers, the main implication is that not all eco-labels and ratings are created equal, and *it is indeed possible to distinguish among them*. Understanding the processes and attributes of their information supply chains can help consumers differentiate among different claims. If consumers like or do not like certain features of particular programs, *let them know* – as Chapter 3 shows, many have mechanisms to listen to feedback from users and consumers. In particular, *encouraging greater transparency* about their methods, sources of funding and environmental outcomes will make it easier to evaluate them, keep them accountable, and push them to improve in the future. *Supporting more systematic efforts* to make the marketplace of eco-labels more transparent and functional as a whole is also recommended, so that consumers can choose among these programs based on their own preferences, rather than on only the limited information they choose to provide.

### **Future Research**

Beyond informing the public about eco-labels and providing the recommendations outlined above (as well as the more detailed recommendations discussed in Chapter 7), it is hoped that this dissertation will stimulate more research on the increasingly prominent role that information-based strategies are playing in environmental management and governance. The dissertation's multi-sector, multi-attribute coding and mapping of the landscape of eco-labels and ratings provides a broader context and important foundation for *deeper analysis into individual sectors and characteristics*, and enables comparable research on similar programs in other countries. The multi-level preferences survey provides a systematic framework for testing preferences for *different forms of eco-labels*, and reveals the *effects of attribute aggregation* on survey outcomes.

Further research can use this framework to elicit the preferences of other samples and populations, and can further explore these attribute aggregation effects.

The dissertation also highlights the central importance of popularity as a concept and metric, and contrasts it with the more commonly-discussed concept of effectiveness. It asserts that it is the popularity of these programs – and not necessarily their effectiveness – that is more likely to determine their future evolution and growth, and therefore encourages other researchers to better understand the drivers of such popularity. Using three of the datasets collected in my research, I conducted the *first known analysis of such popularity drivers* in this dissertation, and provide a starting point for similar analyses in the future. In my final chapter, I also shift attention from objective measures of effectiveness to *stakeholder perceptions of the effects and effectiveness of these programs*, which are arguably more important in determining their ultimate popularity and future trajectories. I make the point that effectiveness is often in the eye of the beholder, and therefore map out different ways my interviewees “see” these programs. This analysis also provides a range of insights that can be explored in future research as well.

More broadly speaking, this dissertation will immediately inform government agencies, non-profit organizations, and companies about the implications of this phenomenon, both in terms of the factors driving it and the effects it is having. It discusses, for example, the effect of these strategies on other governance strategies, such as government regulation. This research also contributes to the theoretical literature on governance, organizations, and the natural environment, and presents conclusions that will advance work in this important area of academic inquiry. I also discuss the policy implications of my results for the future development of information-based environmental governance strategies, and provide specific recommendations for organizations that have or are considering developing their own labels and ratings. The dissertation also provides helpful insights for consumers and other stakeholders who are trying to navigate through the confusing and chaotic world of “green grades” in the marketplace.

## **References**

- Bartley, T. 2003. “Certifying Forests and Factories: States, Social Movements, and the Rise of Private Regulation in the Apparel and Forest Products Fields.” *Politics & Society* 31, no. 3: 433.
- Big Room. “Ecolabel Index.” *Www.ecolabelindex.com*. <http://www.ecolabelindex.com/>.
- Cashore, Benjamin, Graeme Auld, and Deanna Newsom. 2004. *Governing Through Markets: Forest Certification and the Emergence of Non-State Authority*. New Haven: Yale University Press.
- Conroy, Michael E. 2007. *Branded! How the Certification Revolution Is Transforming Global Corporations*. Canada: New Society Publishers.
- Friedman, Monroe. 1999. *Consumer Boycotts: Effecting Change Through the Marketplace and the Media*. New York, NY: Routledge.



- Fung, Archon, Mary Graham, and David Weil. 2007. *Full Disclosure: The Perils and Promise of Transparency*. Cambridge, UK: Cambridge University Press.
- 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, no. 2: 115-127.
- Grankvist, Gunne, Ulf Dahlstrand, and Anders Biels. 2004. "The Impact of Environmental Labelling on Consumer Preference: Negative Vs. Positive Labels." *Journal of Consumer Policy* 27, no. 2: 213-230.
- Gulbrandsen, Lars. 2004. "Overlapping Public and Private Governance: Can Forest Certification Fill the Gaps in the Global Forest Regime?" *Global Environmental Politics* 4, no. 2: 75-99.
- Khanna, Madhu, and Lisa A. Damon. 1999. "EPA's Voluntary 33/50 Program: Impact on Toxic Releases and Economic Performance of Firms." *Journal of Environmental Economics and Management* 37, no. 1: 1-25.
- King, Andrew A., and Michael J. Lenox. 2000. "Industry Self-regulation Without Sanctions: The Chemical Industry's Responsible Care Program." *The Academy of Management Journal* 43, no. 4: 698-716.
- Magat, Wesley A., and W. Kip Viscusi. 1992. *Informational Approaches to Regulation*. Cambridge, MA: The MIT Press.
- Meyer, Arnt. 2001. "What's in It for the Customers? Successfully Marketing Green Clothes." *Business Strategy and the Environment* 10, no. 5: 317-330.
- Popkin, Samuel L. 1991. *The Reasoning Voter*. Chicago: University of Chicago Press.
- Roe, Brian, and Ian Sheldon. 2007. "Credence Good Labeling: The Efficiency and Distributional Implications of Several Policy Approaches." *American Journal of Agricultural Economics* 89, no. 4: 1020-1033.
- Simon, Herbert A. 1982. *Models of Bounded Rationality, Volume 1: Economic Analysis and Public Policy*. Cambridge: MIT Press.
- Teisl, Mario F. 2003. "What We May Have Is a Failure to Communicate: Labeling Environmentally Certified Forest Products." *Forest Science* 49 (October): 668-680.
- U.S. Environmental Protection Agency. "List of Voluntary Partnership Programs." <http://www.epa.gov/partners/programs/>.
- Vogel, David. 2005. *The Market for Virtue: The Potentials and Limits of Corporate Social Responsibility*. Washington, DC: Brookings Institution Press.