

**A LOGIC OF CORPORATE ENVIRONMENTALISM:
"BEYOND-COMPLIANCE" ENVIRONMENTAL
POLICYMAKING IN BAXTER INTERNATIONAL INC.
AND ELI LILLY AND COMPANY**

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Submitted to the faculty of the University Graduate School
in partial fulfillment of the requirements
for the degree
Doctor of Philosophy
in the School of Public and Environmental Affairs
and the Department of Political Science
Indiana University
Bloomington, Indiana

September 1997

UMI Number: 9805430

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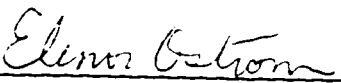
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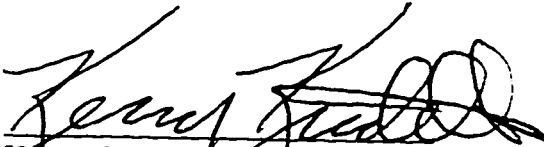
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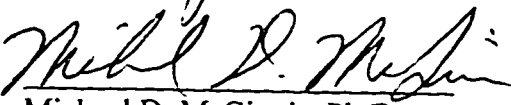
Accepted by the Graduate Faculty, Indiana University, in partial fulfilment of the requirements for the degree of Doctor of Philosophy.


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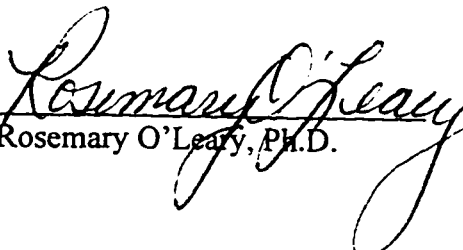

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Acknowledgments

Four years of graduate study at Indiana University has been intellectually challenging and enjoyable. I have been generously supported by many people and organizations in this undertaking.

I have been very fortunate to have Elinor Ostrom as my committee co-chair. Lin is the first reader of this dissertation, and has very constructively challenged me throughout the whole process. I have extensively employed her intellectual constructs in this dissertation as well as in my other intellectual pursuits. Though her busy schedule takes her all over the world, Lin has devoted an incredible amount of time and energy to this dissertation, and to my intellectual development. She has been very prompt in giving extensive and constructive feedback. Lin also provided me with valuable office space at the Workshop equipped with a personal computer, luxury that few graduate students enjoy. This enabled me to work in Workshop's intellectually-rich environment, and interact with scholars from all over the world.

Jeff Hart, also my committee co-chair, has been my friend, philosopher, and guide. My first interaction with Jeff was in his graduate seminar on International Political Economy. I was very impressed by his encyclopedic knowledge about various issues. Since then we have worked together on a number of projects. We have collaborated on a couple of articles, and we are co-editing a series of volumes on the impact of globalization on governance. He has also given me very useful input on this dissertation. Jeff has been the

key influence in my socialization into the world of academics. I consider myself to be very fortunate to have had the opportunity to work and interact closely with him.

Mike McGinnis has contributed significantly in shaping this dissertation as well as influencing my overall intellectual agenda. I have taken three seminar courses with him and these have significantly impacted my academic pursuits. I have been amazed by his clarity of thinking and articulation; I hope some of it has rubbed off in this dissertation. Along with many other graduate students, I greatly appreciate the effort he puts in teaching and mentoring. Mike is one of the few professors who actually provides detailed comments on term papers and dissertation drafts.

Rosemary O'Leary has been a great supporter of this dissertation. She introduced me to the idea of examining environmental policies of Baxter and Lilly. Along with many other SPEA students, I am part of her fan club and consider her to be a role model, both in terms of professional achievements and personal conduct.

Kerry Krutilla has helped me considerable in understanding political economy of environmental issues. We have co-authored a paper and this intellectual engagement proved useful in defining my dissertation research idea. Kerry has played the valuable role of a loyal opposition and thereby helped me to refine my theoretical arguments.

Managers at Baxter and Lilly have been very supportive of my research. Bill Blackburn (Baxter) and Daniel Carmichael (Lilly) enabled me to have access to their respective organizations. Don Brannon (Lilly) was extremely helpful in getting access to appropriate managers as well as documents. I would also like to acknowledge help and support from the following: Rob Currie, Munira Meharauli, Ron Meissen, and Verie

Sandborg (all from Baxter); Jonathan Babcock, Catherine Ehlhardt, Bert Gorman, Joan Heinz, Rick Lattimer, Ronald Pitzer, James Vangeloff, and John Wilkins (all from Lilly).

I am also indebted to Dean James Barnes who wrote to Baxter and Lilly on my behalf, and thus paved the way for my research. Bob Agranoff (the former Chair of SPEA's Ph.D. programs), Larry Schroeder (the current Chair), and Bill Thompson (the former Director of Political Science's Graduate Programs) have actively supported my research. Phil Morgan (the former Director of SPEA's Undergraduate Program) has supported me immensely, especially by giving me opportunities to teach at SPEA.

Vincent Ostrom has been a source of inspiration and intellectual support. I consider myself very privileged to have had the opportunity to interact with him during my four years in residence at the Workshop.

I also wish to thank Anil Gupta (IIM, Ahmedabad) who persuaded me to give up the lucrative world of Procter and Gamble and join the Ph.D. program at Indiana University. Anil has been a source of great support and ideas.

I have been blessed with wonderful friends who have patiently read and reread various dissertation drafts and have given me invaluable substantive and editorial comments. These friends are: Arun Aggrawal, Trevor Brown, Brenda Bushouse, George Candler, Yuche Chen, Nives Dolsak, Ray Eliason, Tom Koontz, Reva Kreie, Matthew Potoski, and Cynthia Yaudes.

I also wish to thank my other colleagues who have helped during my stay in Bloomington. These are: Jennifer Mitchner, Karen Roberts, and Jim Perry (SPEA); Ken Bickers, Doris Burton, Loretta Heyen, Sharon LaRoche, Janette Paterson, and John

Williams (Political Science); and Patty Dalecki, Julie England, Charlotte Hess, Gayle Higgins, Paula Jerrells, Robert Lezotte, Charile Schweik, Linda Smith, and Jimmy Walker (Workshop).

This research involved making numerous visits to Indianapolis (Lilly) and Chicago (Baxter). To defray the costs of fieldwork and other dissertation expenses, I was fortunate to have received funding from the Center for International Business Education and Research, School of Business, Indiana University, and the College of Arts and Sciences, Indiana University.

Finally, my family has supported me emotionally, intellectually, and financially. I have been fortunate to have wonderful parents -- Dr. Om Prakash and Dr. (Mrs.) Kailash Prakash -- who have always stood by me. My brother Anshu, and my sister Charu, have been a source of great support and affection. They have also borne a disproportionate share of family responsibility given my absence from India.


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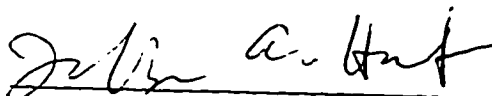
**A LOGIC OF CORPORATE ENVIRONMENTALISM:
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BAXTER INTERNATIONAL INC. AND ELI LILLY AND COMPANY**

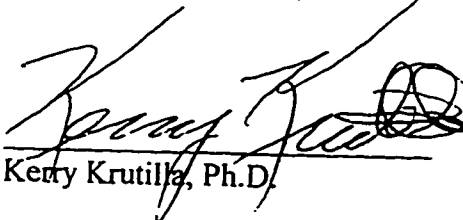
The neoclassical theory treats firms as unitary actors and explains their policies as passive responses to market signals and/or governmental regulations. Consequently, it does not sufficiently explain why firms adopt "beyond-compliance" policies. These policies are more stringent than prevalent laws and regulations and are often predicted not to generate quantifiable profits. My puzzle is: why do firms adopt such policies at all, and why only in some cases, and not in all?


To explore this puzzle, I employ a new-institutionalist perspective. Instead of treating firms as unitary actors, I view them as composite actors, as units of collective action. In the new-institutionalist tradition, I identify three theories of firm behavior: efficiency-, power-, and leadership-based. These represent three kinds of intra-firm processes: consensual (efficiency), imposed (power), and induced cooperation (leadership). Employing these theories, I examine processes of environmental policymaking in two firms -- Baxter International Inc. and Eli Lilly and Company -- during 1975 to mid 1996. I focus on ten cases, four common to both Baxter and Lilly (Underground Tanks, EPA's 33/50 program, ISO 14000, and Environmental Audits), and one each that is idiosyncratic to them (Responsible Care to Lilly and "Green Products" to Baxter).

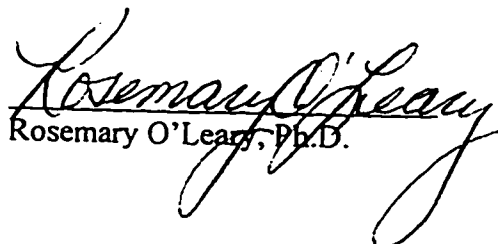
The theoretical implications of my research are: (1) beyond-compliance policies of firms can be explained only by analyzing the preferences and strategies of individuals constituting these firms; (2) to examine social processes, we need multiple theories linked by a common framework; and (3) a greater focus on leadership is required in the study of political economy. Policy implications of my research are: (1) firms are less likely to adopt environmental policies that require significant organizational changes; and (2) firms are more likely to adopt policies that are encouraged by external actors with abilities to significantly influence firms' business environments.


Elinor Ostrom, Ph.D., Co-Chair


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Michael D. McGinnis, Ph.D.


Rosemary O'Leary, Ph.D.

Contents

List of Tables and Appendixes

Chapter 1. Introduction

Theoretical and Policy Puzzles
Research Design and Methods
Case Selection
Organization of the Dissertation

Chapter 2. Environmental Policymaking within Firms

New-Institutionalism
The IAD Framework
Nature of Goods and Services
Policymaking Within Firms
Predictions of Theories of Firms

Chapter 3. Baxter and Lilly: Evolution of Environmental Programs

Baxter: An Overview
Evolution of Environmental Programs
Lilly: An Overview
Evolution of Environmental Programs
Baxter and Lilly: A Comparison of Environmental Programs

Chapter 4. Underground Storage Tanks

Background
Baxter and Lilly: Response
Puzzle
Predictions of Theories of Firms
Analysis

Chapter 5. Toxic Release Inventory and 33/50 Programs

Background
Baxter and Lilly: Response
Puzzle
Predictions of Theories of Firms
Analysis

Chapter 6. Responsible Care

Background
Puzzle
Predictions of Theories of Firms
Analysis

Chapter 7. ISO 14000

Background
Puzzle
Predictions of Theories of Firms
Analysis

Chapter 8. Environmental Audits

Background
Puzzle
Predictions of Theories of Firms
Analysis

Chapter 9. “Green Products”

Background
Baxter and Lilly: Response
Puzzle
Predictions of Theories of Firms
Analysis

Chapter 10. Beyond-Compliance: Findings and Conclusions

Overview

Theoretical Implications

Policy Implications

Limitations of the Research

Bibliography

Appendix

Vita

List of Tables and Appendixes

Tables

- 1.1 Cases and Their Dimensions
- 2.1 Categories of Environmental Policies
- 2.2 Endogeneity and Exogeneity in Environmental Policymaking
- 2.3 The Nature of Goods and Services
- 3.1 Baxter International Inc.: Financial Highlights
- 3.2 Eli Lilly and Company: Financial highlights
- 4.1 UST Population Affected by EPA Regulations
- 4.2 EPA's Time Plan For Implementing UST Guidelines
- 4.3 Baxter's Experience: 77 USTs at 32 Sites
- 4.4 Baxter's Progress on UST Removal
- 4.5 USTs in Eli Lilly
- 5.1 Major TRI and 33/50 Projects at Lilly
- 5.2 Major TRI and Waste-Minimization Projects at Baxter
- 5.3 Lilly's Performance on the 33/50 Program
- 5.4 Baxter's Performance on the 33/50 Program
- 6.1 Major Industrial Accidents in the 1970s-1990s
- 6.2 Injury Rates and Firm Size
- 6.3 Lilly's Internal Evaluation of Responsible Care
- 6.4 Responsible Care: Implementation Status
- 7.1 Number of Facilities with ISO 9000 Registration
- 7.2 Harmonized Versions of ISO 9000
- 7.3 ISO 14000 Series: An Overview
- 7.4 Lilly's Environmental Program Staff
- 8.1 Internal Audits Performed at Lilly
- 9.1 Impact of Greening on Consumers
- 10.1 Findings
- 10.2 External Actors
- 10.3 Organizational Change

Appendixes

- 1.1 Key U.S. Environmental Initiatives
- 1.2 Pollution-Control Costs for the U.S.
- 2.1 Syllabi of Leading Business Schools
- 3.1 Baxter's Environmental Policy
- 3.2 Baxter's Environmental Financial Statement
- 3.3 Lilly's Environmental Policy and Guidelines
- 4.1 Lilly's Underground Storage Tanks
- 5.1 Press Clippings on Baxter's Environmental Performance
- 7.1 Lilly's Environmental Quality System
- 7.2 Baxter's Environmental Awards
- 10.2 Lilly's ISO 9000/ISO 14000/Lilly EMS/Responsible Care Matrix

Notice

This dissertation is not an official or authorized account of environmental policymaking in either Baxter International Inc. or Eli Lilly and Company. This dissertation represents the author's analysis and interpretations of events pertaining to environmental policymaking in the above two firms.

Chapter 1

Introduction

Though environmental problems have challenged humankind since time immemorial, environmental issues have received serious attention from policy scientists only since the 1960s and 1970s. A series of industrial accidents (for example, oil spills in Santa Barbara, Nova Scotia, Louisiana, and Florida) and media events such as the publication of Rachel Carson's *Silent Spring* (1962) highlighted environmental consequences of unfettered industrialization. Responding to public concerns, in the 1970s the U.S. Congress enacted a series of top-down commands in the form of laws stipulating environmental standards and technologies for firms.¹ These policies were supposed to be backed by zealous monitoring and enforcement. In the 1980s, dissatisfaction with the inefficiencies of command and control policies began to be articulated.² The capacities of governmental agencies to implement detailed regulations were also questioned.

Since the late 1980s, particularly after the Rio Summit of 1992, policymakers appear to have accepted that governmental coercion alone will not be sufficient in forcing firms to adopt environmentally sustainable policies; “right incentives” must to be provided.³ More recently, policymakers are beginning to play down their adversarial role, and are highlighting

¹ See the list of key U.S. environmental initiatives in Appendix 1.1.

² See the trends in pollution control costs in Appendix 1.2.

³ The literature on “incentive-based” environmental regulations is rather vast. Key works include Hahn and Nell (1982), Lee and Misiolek (1986), Baumol and Oates (1988), Oates et al. (1989), Atkinson and Tietenberg (1991), and Tietenberg (1992).

the potential gains of collaborating with firms in developing and implementing environmental policies. Regardless of whether firms are viewed as adversaries (as in the 1960s, 1970s, and 1980s) or as potential partners (as in the 1990s), environmental policy scientists have implicitly treated firms as internally undifferentiated actors having similar responses to external incentives. An understanding of the internal processes of policymaking is not on the agendas of most policymakers or policy scientists.⁴

Theoretical and Policy Puzzles

In this dissertation I examine some of the processes of environmental policymaking and inter-managerial interactions *within* firms. I focus on “beyond-compliance” environmental policies: those that seek to deliver more than the requirements of current laws and regulations. Treating “corporate environmentalism” as equivalent to adopting beyond-compliance policies, my *theoretical puzzle* is: why firms adopt or do not adopt beyond-compliance policies? I examine questions such as: how do managers make decisions on environmental policies; what are the decision criteria; do managers have different preferences on environmental policies, and if so, then do such differences impact policy adoption; are beyond-compliance policies adopted only if they are projected to deliver adequate levels of monetizable profits assessed through established procedures; how are non-

⁴ Notable exceptions are Fisher and Schot (1992), Gable (1994), and Bunge et al. (1994). In other policy areas and disciplines, internal processes have been extensively studied (March and Simon, 1958; Williamson, 1964; Allison, 1971) and I employ some of these concepts in this dissertation. Specifically, I recognize that managers establish procedures to cope with uncertainty, and to impart objectivity in assessing desirability of projects. I focus on procedures, particularly capital-budgeting, employed for assessing profitability of projects requiring up-front capital expenditures.

monetary benefits brought into the equation, if they are at all; does the hierarchical position of policy-supporters and policy-skeptics matter? Since answers to these questions vary across firms, and across policies within a specific firm, I investigate internal processes and inter-managerial interactions on environmental policymaking.

Internal processes and inter-manager interactions are also influenced by external organizations such as governmental regulatory agencies, industry associations, and customers that seek to encourage or discourage the adoption of a beyond-compliance policy. I focus on the managerial perceptions of benefits and costs that such organizations could impose on them and on their firms? My *policy puzzle* therefore is: why and how do external factors aid or thwart the efforts of supporters of beyond-compliance policies to persuade their firms to adopt beyond-compliance policies?

Neoclassical economics treats managers as intervening variables between external factors and policy outcomes. However, managers have “coping mechanisms” (Leibenstein, 1966) and are potentially capable of a certain degree of autonomous action. Instead of passively responding to external factors, managers may employ them to influence internal processes to promote their own agendas or impede opposing agendas.⁵ Environmental policymaking can, therefore, be viewed as a multi-level game involving internal processes, interactions among managers with varying preferences and endowments⁶, and external

⁵ As discussed in the literature on regulation, sometimes managers may even shape external factors. Stigler (1971) argues that firms may lobby for regulations in certain circumstances. Bernstein (1965) suggests that business firms may “capture” governmental agencies that are supposed to regulate them. Kolko (1963) provides an interesting account of how the railroad industry “captured” the regulatory agencies.

⁶ An examination of internal processes is important precisely because managers do not have identical preferences and endowments. By endowments I mean the position of a manager in the firm’s hierarchy.

factors.⁷

To understand policy processes within firms, we need to explicate our notion of a firm. Neoclassical economists often treat firms as unitary actors seeking to maximize profits. This parsimonious view is useful in predicting market outcomes in highly competitive markets or when policies are required by laws that are strictly enforced. However, it is not so helpful in explaining why firms adopt or do not adopt beyond-compliance policies. For this we need to examine the internal processes of firms. Treating firms as composite actors consisting of many managers, I employ a new-institutionalist perspective.⁸ Further, I assume that though maximizing profits that can be assessed through established procedures is often the preeminent goal of most managers, it is not the only goal. I classify managers into two categories: (1) policy-supporters favoring the adoption of beyond-compliance policies whose profit impact is not quantified; and (2) policy-skeptics who oppose such policies.⁹

It may not be possible *ex ante*, or even *ex post*, to quantify the impact of a policy on firm's profits. In their assessment of monetary profits, managers are often faced with

Senior managers often have the power to impose the adoption or non-adoption of beyond-compliance policies. Apropos preferences, I infer them from managerial behavior, and my detailed interviews and discussions with them. Though I do not systematically examine why managers have adopted certain preferences (for or against beyond-compliance policies), I do examine the professional backgrounds of managers and their reasons for supporting or opposing given beyond-compliance policy.

⁷ I am inspired by the literature in International Relations on "two-level games." This literature argues that international politics and domestic politics influence each other. Important works include Putnam (1988), Mastanduno et al. (1989), McGinnis and Williams (1993), Evans et al. (1993), and Knopf (1993).

⁸ In Chapter 2, drawing upon the works of Elinor and Vincent Ostrom and other colleagues at the Workshop in Political Theory and Policy Analysis (E. Ostrom, 1986, 1990, 1994, 1996; E. Ostrom et al., 1994; V Ostrom, 1997), I discuss my notion of new-institutionalism.

⁹ I do consider policies that require significant expenditures (up to \$100 million in the case of underground tanks). However, I do not consider policies whose adoption may bankrupt the firm; I see no reason why any manager would support such policies.

incomplete information on future prices and costs. To cope with incomplete information, 'boundedly rational' managers adopt procedures such as capital-budgeting. Such tools are managerial responses to cope with an uncertain future, specifically to have *ex ante* estimates of future profits.

Capital-budgeting requires estimating future benefits and costs and discounting them with an appropriate discount rate. If a project meets or exceeds a given rate-of-return, it is deemed as potentially profitable. Consequently, capital-budgeting ensures that managers examine investment decisions objectively with a focus on maximizing shareholders' wealth. This is an important safeguard for shareholders that often have little say in the running of firms, and are hence vulnerable to agency abuses by managers.

Tools such as capital-budgeting are appropriate to assess profitability of projects that involve up-front capital expenditures and generate future cash-flows. Since some beyond-compliance policies may not involve capital expenditures, such tools are inappropriate for assessing their profitability. In general, it is difficult to assess the impact on profits of policies that focus on establishing management systems, and hence do not generate revenue or decrease monetizable costs. To assess their profit impact, managers employ subjective methods. Such projects are justified by arguments such as "they are good for the firm in the long run" and "they are important for keeping the Environmental Protection Agency in good humor."

Further, some policies involving significant up-front capital expenditures may be adopted without being subjected to capital-budgeting. This suggests that established procedures are not applied consistently. Again, the benefits of such projects are justified on

similar grounds as discussed above. This suggests that policymaking within firms involves a complex mix of factors. Intra-firm processes, inter-manager interactions, and managerial perceptions of external factors are important in influencing whether or not a beyond-compliance policy is adopted.

Within a new-institutionalist perspective, I draw upon three broad theories of internal behaviors of firms: efficiency-, power-, and leadership-based. Efficiency-based theorists examine an important puzzle that is not adequately addressed by neoclassical economics: why firms arise at all; alternatively why and how managers arrive at 'make or buy' decisions. Following Coase (1937), efficiency-based theorists view firms as institutions to economize on transaction costs by allocating resources by hierarchical fiat, and not by market mechanism. Williamson (1975, 1985) focuses on how firms evaluate 'make or buy' decisions, and suggests that these decisions reflect managers' desire to minimize transaction costs given asset-specificity, bounded rationality, and a potential for labor's opportunism.

Efficiency-based theories do not specifically address my puzzle: why firms adopt beyond-compliance policies at all, and why only selectively? I interpret the broad message of efficiency-based theories as being that firms adopt only those policies that can be demonstrated *ex ante* as being potentially profitable. There is a shared understanding among managers of the legitimacy of established procedures (such as capital-budgeting) for assessing the profitability of projects. Efficiency-based explanations therefore suggest that managers will assess costs-benefits of beyond-compliance policies *ex ante*, and adopt those policies that are projected to generate certain levels of net benefits. Further, since maximizing firm's measurable profits is the primary objective for all managers, policy

processes would be consensual. This is not to say that managers have identical preferences on environmental policies. Probably they do not. However, since there is consensus that for any policy to be adopted, it must meet or exceed the profitability criteria, different managerial preferences are not predicted to play out in the policymaking processes.

Efficiency-based theories do not shed much light on how managers operationalize transactions costs *ex ante*, or how managers actually make investment decisions. Implicitly, such theories assume that firms have well-defined investment appraisal procedures. However, if firms do not have such procedures, if managers do not apply them consistently, or if such procedures cannot be meaningfully employed (for policies that do not involve capital expenditures), then efficiency-based theories offer little help in predicting whether or not a beyond-compliance policy will be adopted.¹⁰ As a result, we would be unable to verify the assertion that firms attempt to be efficiency-enhancing governance structures.

If policy adoption or non-adoption cannot be explained by efficiency-based theories, then my strategy is to employ power-based or leadership-based explanations. Power-based theories view firms as mechanisms of dominance rather than as efficiency-enhancing structures. Since managers may have conflicting preferences, policies are adopted only if supported by hierarchically-superior managers that have the capacities to impose their decision on the organization. Policy-skeptics have little choice in this matter. Since policy

¹⁰ Had managerial preferences for or against beyond-compliance policies been identical, efficiency-based would remain useful. The problem arises since some managers (policy-supporters) think that their firm ought to adopt a given beyond-compliance policy even though its profit impact is not quantifiable whereas others (policy-skeptics) want policy adoption to be guided by established appraisal procedures only. Different preferences, coupled with different endowments (senior versus junior managers), suggests that one group could impose its preferences (power-based processes). Alternatively, policy-supporters may have the skills to induce policy-skeptics to change their preferences (leadership-based processes).

processes are marked by imposition, we should expect to find evidence of dissent. Policy-supporters can be expected to justify such imposed policies in terms of their long-term benefits, although *ex ante* non-monetizable, to the firm. Policy-skeptics may not buy into these arguments. Power-based theories predict that their skepticism will be brushed aside and supporters will impose policies on the organization.

In contrast, leadership-based explanations suggest that policy-supporters succeed in convincing skeptics about the long-term benefits of the proposed policy, even though they provide no *ex ante* estimates of such future benefits. Policy-supporters adopt a variety of strategies such as emphasizing benefits of keeping the coercive external actor (who is encouraging this policy) in good humor. Their personal credibility and expertise in the issue area is often helpful in strengthening their persuasive abilities. Thus, although policy-skeptics oppose such policies in the short-run, they change their preferences, and eventually such policies are adopted consensually.

In examining beyond-compliance policies, I first employ efficiency-based theories: could the profitability of a beyond-compliance policy be assessed by employing capital-budgeting? If the efficiency-based logic does not hold (that is, capital-budgeting was either inapplicable or, if applicable, it was not employed), I turn to power- or leadership-based theories. I classify policy processes marked by imposition as power-based, and processes marked by induced consensus as leadership-based. I identify policy-supporters and policy-skeptics, their positions in the hierarchy, and their strategies and logics for supporting or opposing a policy.

Since I infer preferences from behaviors, I do not examine why policy-supporters or

policy-skeptics have certain preferences. However, I do seek to understand whether policies adoption requires significant levels of organizational changes that upset the status quo, and thereby create incentive for “losers” to oppose a policy. I also examine how factors external to firms support or impede the efforts of policy-supporters.

Research Design and Methods

At an empirical level, I focus on two firms: Baxter International Inc. and Eli Lilly and Company. Both Baxter and Lilly are multinational corporations (MNCs). Since MNCs are important economic actors, they have critical roles in environmental policymaking and implementation (Walters, 1973; Pearson, 1985; World Commission on Environmental and Development, 1987; Robinson, 1988; Leonard, 1988; World Development Report, 1992; Schmidheiny, 1992; Low and Safadi, 1992; Vogel, 1995; Schmidheiny and Zorraquin, 1996). Therefore, an objective of many environmental policies is influencing environmental performance of MNCs. This requires an understanding of how MNCs make environmental policies. Unfortunately, there is little literature on this subject since most environmental policy scholars treat MNCs (or any firm for that matter) as unitary actors.

In this dissertation, I study environmental policymaking in the U.S. operations of Baxter and Lilly. I do not study environmental policymaking in their subsidiaries outside the U.S.¹¹ For most MNCs operating in industrialized countries, compliance with domestic

¹¹ As I have discussed elsewhere, there is an incorrect perception that MNCs systematically adopt lower environmental standards in their subsidiaries located in developing countries (Prakash et al., 1996).

environmental regulations is often a non-issue.¹² I attribute such compliance to stringent laws specifying significant civil and criminal liabilities, relatively serious implementation of environmental laws by regulatory bodies and the courts, active monitoring by environmental groups and local communities, and pressure from employees to “go green” The battle within firms is now being fought in a different arena: to what extent should firms go beyond compliance?

Why do I study Baxter and Lilly? According to a recent survey commissioned by the United Nations Conference on Trade and Development (UNCTAD, 1993), environmental policies of MNCs are significantly influenced by three factors.¹³ These are: (1) line of business; (2) sales volume; and (2) home country. I briefly discuss these factors below:

The Line of Business

The high-risk industries as well as the ‘sun-rise’ industries have the strongest environmental programs. High-risk industries such as oil and chemicals have extensive environmental programs because even a single industrial accident can inflict significant costs on them.¹⁴ Since sun-rise industries such as electronics, biotechnology, and specialty chemicals have quick product obsolescence, they replace their capital equipment in short-cycles. Consequently, they are afforded opportunities to install state-of-the-art resource-

¹² Though previously many companies have resisted compliance.

¹³ This is the largest survey of environmental policies of MNCs to date.

¹⁴ Exxon's liabilities due to the Exxon-Valdez disaster are estimated at about \$5 billion (*New York Times*, June 14, 1996).

efficient technologies. Further, their high profitability provides them with resources for investing in environmental programs that often have long gestation lags.

The Size of MNCs

Large MNCs (sales of \$4.9 billion and above) have more comprehensive environmental programs than the smaller MNCs because they can tap economies of scale on such expenditures.

The Home Country of the MNC

The scope and content of environmental practices vary significantly across regions.

The UNCTAD survey notes that:

[P]robably the nature of the regulatory environments in the home country of the corporation explains variations The tendency of Asian corporations [that is, Japanese] to view EH&S [Environmental Health and Safety] activities as business opportunities could be related to the fact that Japanese EH&S policy is formulated to a large extent by the Ministry for International Trade and Industry and not the Environmental Agency. The relatively low utilization of EH&S policies and practices in Europe is probably related to the fact the European environmental regulations tend to rest on administrative enforcement and cooperation between industries. On the other hand, United States' environmental regulation has traditionally been described as adversarial and aggressive, and seems to have encouraged the TNCs [transnational corporations] to establish EH&S procedures to minimize liabilities (1993: 93).

I have controlled for three factors identified by the UNCTAD report. Baxter and Lilly share the following characteristics:

- (1) Their annual sales exceed \$4.9 billion: \$9.3 billion for Baxter¹⁵ and \$6.7 billion for Lilly.
- (2) They are in the health-care industry.
- (3) They have American parents, that is, the U.S. is their home country.

In addition, these firms are:

- (4) significantly globalized (the non-U.S. operations account for 42.5 percent of Lilly's sales and 28.2 percent of Baxter's sales); and
- (5) formally committed to adopting beyond-compliance environmental policies (Baxter, 1994a; Eli Lilly, 1994a).

At an empirical level, I examine ten cases of beyond-compliance policymaking: four common to both firms (Underground Tanks, 33/50, ISO 14000, and Environmental Audits), and one each idiosyncratic to them (Responsible Care to Lilly and Green Products to Baxter). These cases pertain to policymaking during 1975 to mid 1996. All cases are briefly described below:

Underground Storage Tanks

Underground storage tanks can contaminate soil and ground-water creating significant clean-up costs. Consequent to EPA's regulation in 1985, both Baxter and Lilly removed their existing single-walled underground tanks, and installed new tanks that have significant beyond-compliance features. I examine why these firms invested huge amounts

¹⁵ On October 1, 1996, Baxter announced that it has reorganized itself into two corporations: Baxter International Inc. and Allegiance Corporation. Baxter International Inc. will focus on developing medical technologies and Allegiance Corporation will focus on supplying medical and laboratory products (Baxter, 1996). Since I am studying environmental policymaking in Baxter and Lilly during 1975-mid 1996, Baxter's reorganization does not affect my research design or analysis.

on beyond-compliance features: about \$10 million for Baxter and \$30-40 million for Lilly.

Toxic Release Inventory and EPA's 33/50 program

Both Baxter and Lilly took significant beyond-compliance initiatives to reduce their releases of chemicals listed under the Toxic Release Inventory program (TRI). Lilly has invested about \$80 million for reducing its releases of TRI chemicals and Baxter has invested about \$10 million for reducing its releases of TRI chemicals, air-toxics, and chlorofluorocarbons.

33/50 is a voluntary beyond-compliance program launched by the EPA in 1991. Firms are encouraged to commit to reducing aggregate releases of seventeen specific TRI chemicals 33 percent by 1992 and 50 percent by 1995 with 1988 as the baseline. Both Baxter and Lilly are charter members of this program and both have exceeded their 1995 objectives.

Chemical Manufacturers Association's Responsible Care

The Chemical Manufacturers Association (CMA) launched Responsible Care in 1989. Under this program, CMA's member firms are asked to adopt a series of beyond-compliance policies. This case focuses on Lilly only. After initial hesitation on some aspects of this program, Lilly adopted Responsible Care, and now is a show-case example of its successful implementation.

International Organization for Standardization's ISO 14000

The ISO 14000 series specifies beyond-compliance management systems. These

standards have been sponsored by International Organization for Standardization, a Geneva-based non-governmental organization. ISO 14000 could be viewed as an industrial code of practice that needs to be certified by external auditors. This certification is done at facility level. Currently, such certification is estimated to cost about \$20,000 per facility. Neither Baxter nor Lilly have mandated that their facilities should have the ISO 14000 certification; they have adopted a wait-and-see policy. This could be attributed to their extant investments in other industrial codes (Responsible Care for Lilly, and the state-of-the-art program for Baxter), and little perceived gains from switching over to ISO 14000.

Environmental Audits

Though there is major controversy over granting attorney-client privilege to environmental audits, both Baxter and Lilly have established strong internal audit programs. In addition, Baxter invites external auditors to evaluate its environmental programs. In 1991, Arthur D. Little was invited to help in defining the state-of-the-art environmental standards, and in evaluating whether Baxter's environmental program met those standards.

“Green” Products

Both Lilly and Baxter have adopted a variety of beyond-compliance policies to “green” their manufacturing operations and management systems. However, only Baxter markets green products, the ones that explicitly promise environmental protection as one of their benefits. Given the nature of Lilly’s business of manufacturing and marketing ethical or prescription drugs, green products have little business rationale.

I have gathered information on these cases from the following sources: interviews with managers (both in-service and retired), attendance as an observer in meetings of various environmental teams, review of published as well as unpublished documents, and professional journals. I signed a confidentiality agreement with both Baxter and Lilly. This enabled me to have access to their internal and confidential documents, to attend meetings of their environmental teams, and to interview their managers. However, given the confidential nature of some information, I was required to have this dissertation approved by them for accuracy of facts (not interpretation), and I have already done so. As a result, I have their permission to publish this dissertation as a book or individual chapters as stand-alone articles. Most managers in these firms have been extremely cooperative in sharing information and have not attempted to influence my interpretation of events. However, to maintain confidentiality of my sources, I do not identify them in my discussions of the various cases, except when I am quoting from a published document.

Case Selection

In examining the above cases, I define my dependent variable as the adoption or non-adoption of beyond-compliance policies, and my independent variables as factors internal and external to firms. The internal factors include: whether a policy required up-front capital expenditure or whether it involved establishing management systems; the level of expenditures, and the degree of organizational change required to implement a policy. Some of these policies involved significant capital expenditures (Underground Tanks and 33/50, in particular) and could therefore have been subjected to investment appraisal procedures.

On the other hand, others policies involved establishing management systems (Responsible Care and ISO 14000) whose financial impact cannot be quantified. In addition, the degree of organizational change required for implementing such policies also varied: “minimal” for underground tanks and “significant” for external audits.¹⁶

For understanding the roles of external factors, I focus on the managerial perceptions (and how they were shaped) of the abilities of such organizations to impose excludable costs or provide excludable benefits to firms and to individual managers. I examine the following external factors: governmental agencies (the EPA), non-governmental international organization (the International Organization for Standardization); industry-level association (the CMA), and customers (hospitals).

As shown in Table 1.1 below, these cases also pertain to different time periods: from the mid 1980s (Underground Tanks) to mid 1996 (ISO 14000). They also represent policy initiatives at different scales of aggregation: specific to a firm (Underground Tanks), specific to chemical industry (Responsible Care), specific to manufacturing firms across industries (33/50), and impacting virtually all firms in the economy (ISO 14000).

[Insert Table 1.1 About Here]

Following King et al. (1994), I have selected cases to ensure variations on independent variables. However, King et al. also advise that with a small sample size,

¹⁶ Minimal changes involve only operational-choice level while significant changes involve collective- and constitutional-choice level. I discuss the three levels of institutional analysis (operational-, collective-, and constitutional-choice) in Chapter 2.

researchers should consciously ensure variations on the dependent variable as well. As a result, though I predominantly focus on cases where beyond compliance policies were adopted (since this is my theoretical puzzle), I also study four cases of non-adoption (ISO 14000 in Baxter and Lilly; External Audits in Lilly, and phase one of Responsible Care in Lilly).

Organization of the Dissertation

I have organized this dissertation into ten chapters, including this introductory chapter. In Chapter 2, I lay out the theoretical foundations of this dissertation. I discuss my notion of new-institutionalism, the Institutional Analysis and Development (IAD) framework, the nature of goods and services, three categories of theories of internal behaviors of firms (efficiency-, power-, leadership-based), and the predictions of these theories in the context of beyond-compliance policies. In Chapter 3, I first briefly provide an overview of the activities of Baxter and Lilly. I then describe evolution of their environmental programs from 1975 to mid 1996. Finally, I compare the environmental programs in the two firms. In Chapters 4-9, I examine ten cases of beyond-compliance policies and explore processes leading to their adoption or non-adoption. These processes are examined by employing efficiency-, power-, and leadership-based theories. In Chapter 10, I first examine theoretical and policy implications of this dissertation. Finally, I discuss the limitations of this research.

Table 1.1
Cases and Their Dimensions

	<i>External factors encouraging or discouraging this policy</i>	<i>Time Period</i>	<i>Scope</i>
Underground Tanks	Encouraged by Environmental Protection Agency	Mid 1980s- Late 1980s	Firm
TRI and 33/50	Encouraged by the Environmental Protection Agency	Late 1980s- Early 1990s	Manufacturing industry
Responsible Care	Encouraged by Chemical Manufacturers Association	Late 1980s	Chemical industry
ISO 14000	Encouraged by a Geneva-based non-governmental organization	Mid 1990s	All industries
Environmental Audits	Discouraged by the Environmental Protection Agency; encouraged by state environmental agencies	Early 1990s- Mid 1990s	Firm
“Green Products”	Encouraged by health-care providers such as hospitals	Early 1990s	Firm

Chapter 2

Environmental Policymaking Within Firms

In this dissertation I focus on intra-firm processes and inter-managerial interactions on environmental policymaking. In my efforts to examine why firms adopt beyond-compliance policies, I first consider whether or not a proposed policy meets or exceeds the profit criteria as stipulated in capital-budgeting or some other established investment appraisal procedure. Second, I consider whether this policy is required by law or whether it goes beyond compliance. With these two attributes in mind, I identify four modal types of environmental policies: Type 1 (those which go beyond compliance and also meet or exceed the profit criteria), Type 2 (those which go beyond compliance but cannot or do not meet the profit criteria), Type 3 (those which are required by laws and also meet or exceed the profit criteria) and Type 4 (those which are required by laws but cannot or do not meet the profit criteria). This discussion is summarized in Table 2.1:

[Insert Table 2.1 About Here]

Since Type 3 and Type 4 policies are required by laws and regulations, we expect firms to adopt them. Therefore in this dissertation I do not focus on these policies. Many firms such as 3M, Procter and Gamble, and Dow have enthusiastically adopted Type 1 policies (Porter, 1991; Smart, 1992; S. Hart, 1995; Porter and van der Little, 1995; Cairncross, 1995; Shrivastava, 1995). Such policies are consistent with the profit-

maximizing model since they enable firms to capture the “low-hanging fruit”: that is, projects that are predicted, *ex ante*, to generate monetizable profits if new organizational policies and structures were to be adopted. Importantly, such policies meet or exceed the criteria stipulated in established procedures of project appraisal and investment analysis.

Type 2 policies are of two kinds. First, they include those policies that require up-front capital expenditures but are not subjected to appraisal procedures. Second, they represent projects that do not involve capital expenditures, and whose impacts on monetary profits cannot be assessed by using established procedures, if it can be assessed at all.¹⁷ Adopting Type 2 policies is therefore inconsistent with the profit-maximizing model of firms.

Can such policies be explained by assuming that, in dealing with environmental issues, firms are driven by non-profit objectives?¹⁸ Here, we again run into problems. An environmentally conscious firm should adopt all proposed Type 2 policies. However, we often observe that a given firm selectively adopts such policies. The puzzle then is to explain why do firms adopt Type 2 policies at all, and why selectively?

To explore this puzzle, I depart from the neoclassical theory and employ a new-institutionalist perspective. Instead of treating firms as unitary actors, I treat them as

¹⁷ An example could be establishing new management systems. I have not come across an instance where managers have formally assessed profitability of such projects. I hypothesize that if any manager has indeed prepared such estimates, then it would be extremely subjective, and lack credibility within or outside the firm.

¹⁸ As I elaborate later in this chapter, supporters of Type 2 policies do portray them as benefiting the firm in the long run. However, policy-supporters do not provide any *ex ante* monetary estimates of such benefits.

composites consisting of multiple actors.¹⁹ My *ultimate* unit of analysis is the individual actor within the firm. Further, I assume that some managers may prioritize some environmental objectives over a simple effort to minimize costs of production. I focus on one such objective: adopting Type 2 policies. I classify managers in two categories: *policy-supporters* that favor adoption of Type 2 policies and *policy-skeptics* that do not.²⁰

Once we acknowledge that some managers may pursue environmental objectives that do not or cannot meet the profit criteria, policies of firms can no longer be explained as passive responses of managers to external stimuli, in particular, market signals and governmental regulations. Rather, policies *also* reflect interactions among managers with different objectives or different prioritizations of similar objectives. It is therefore difficult to predict, *ex ante*, whether policy-supporters or policy-skeptics will always prevail. The final outcome depends on a variety of factors such as policy-supporters' hierarchical position, their persuasive or canvassing abilities, their expertise in the issue area, and how

¹⁹ Unpacking of firms has a long history. Important works, especially in the field of organizational theory, include March and Simon (1958), Katz and Kahn (1966), and Thompson (1967). The environmental policy scholars, surprisingly, still predominantly treat firms as unitary actors. Notable exceptions are Fisher and Schot (1992), Gable (1994), and Bunge et al. (1994).

²⁰ My strategy is to infer preferences from the actions of managers. I do not explain why managers possess certain preferences. However, in my one-on-one interviews, I did gather information on the professional backgrounds of managers working on environmental issues across functional areas. From these interviews it was clear that most of them had strong personal commitments to environmental issues. This was not surprising since they chose to work on environmental issues; not because of organizational-level incentives such as special allowances or faster promotions. Many of these managers also claimed to be "environmentalists;" some of them claimed to support the Sierra Club and other environmental groups financially. I also observed posters on environmental issues adorning offices of most of these managers. Most of them are very active in Earth Day celebrations. Such display of support for environmental issues, and my numerous discussions with them leads me to infer that most of these managers indeed hold strong beliefs on environmental issues. Thus, I expect that such managers would support Type 2 policies. On the other hand, I also expect "losers" from any organizational change that results from a Type 2 policy to assume the role of policy-skeptics. These losers could belong to environmental departments or work on environmental issues in other departments.

they invoke external factors to shape perceptions of policy-skeptics. Further, the policy outcome would also be influenced by the degree of organizational change required for its implementation: the greater the predicted change, the stronger the incentives are for the “losers” to oppose policy adoption. Consequently, the likelihood of policy-adoption decreases.

To understand the intra-firm processes and inter-managerial interactions of environmental policymaking, I employ the theoretical tools of new-institutionalism and the Institutional Analysis and Development (IAD) framework. New-institutionalists emphasize the role of a broad set of institutions in shaping individual incentives, and thereby impacting collective action (North, 1981, 1990; Bates, 1983; E. Ostrom, 1990; Furubotn and Richter, 1991). In the new-institutionalist tradition, I identify three categories of theories of internal behaviors of firms – efficiency-, power-, and leadership-based. Though these theories view firms as composite actors, they suggest different impacts of inter-managerial interactions on policymaking. None of these theories alone explains all the aspects of my puzzle. Rather, individually each of them is important in illuminating certain aspects, and collectively they explain all aspects of my puzzle.

New Institutionalism

New-institutionalists integrate insights from neoclassical economics, historical institutional economics, political science, and sociology by examining the dynamics between

economic and political behaviors in a given institutional context (North, 1990).²¹ The central message of new-institutionalism is that *institutions matter* in influencing individual-level as well as collective-level outcomes. This begs the question as to what institutions are and how they evolve.²² In this regard, new-institutionalists distinguish institutions from organizations. Institutions are enforced rules about what actions are required, prohibited, or permitted (E. Ostrom, 1986) while organizations are collections of physical actors (North, 1992). For example, courts of law are organizations, whereas laws themselves are institutions. Similarly, a firm is an organization while its policies and rules governing actions of its managers are institutions. Managers (unitary actors) of firms (composite actors) operate within the constraints set by the institutions that are internal and external to firms. Since institutions mediate among individuals and collectivities, new-institutionalists analyze various realms of collective action (such as markets, firms or commercial bureaucracies, non-profit bureaucracies, and governmental bureaucracies) using the same theoretical perspective.

The fact that institutions matter does not necessarily imply that agents passively respond to structures. New-institutionalists treat institutions (structures) as purposive artifacts and not as spontaneous outcomes.²³ Thus, even though institutions matter, agents

²¹ Arrow observes that new-institutional economics has become popular since it:

[D]oes not consist primarily of giving new answers to traditional questions of economics -- resource allocation and degree of utilization. Rather, it consists of answering new questions, *why economic institutions have emerged the way they did and not otherwise* (1987: 734; italics mine).

²² Commons ([1934] 1961: 69) defines institutions as “collective action in control of individual action.”

²³ In contrast, Hayek observes that:

If social phenomena showed no order except insofar as they were consciously designed,

can potentially create or modify some structures at one point in time which, in turn, constrain their behavior at another point in time.²⁴ As a new-institutionalist, I focus on induced cooperation (not on the Hayekian notion of spontaneous cooperation) and impediments to it. Specifically, I focus on cooperation (or lack of it) among managers of firms on Type 2 policies.

In undertaking institutional analysis, new-institutionalists employ three assumptions: methodological individualism, pursuit of self-interest, and bounded rationality. These are discussed below.

Methodological Individualism

Individuals are viewed as the *ultimate* units of analysis.²⁵ Collective entities such as firms or governments are not reified; they are treated as composite actors. Jensen notes that:

there would ... only be problems of psychology. It is only insofar as some sort of order arises as a result of individual action but *without being designed by any individual* that a problem is raised which demands theoretical explanation (1955: 9; italics mine).

²⁴ For this reason, Snidal (1995) refers to institutions as endogenous parameters. In contrast, scholars emphasizing structures over agents treat structures as exogenously given to agents. For example, within International Relations literature, the neorealists argue that foreign policies of states (agents) are determined by their place in the international system (structure) (Waltz, 1979; Grieco, 1988).

²⁵ Buchanan emphasizes the distinction between:

[I]ndividualism *as a method of analysis* and individualism *as a norm for organizing society* ... [the former] suggests simply that all theorizing, all analysis, is resolved finally into considerations faced by the individual person as a decision-maker ... analysis reduces to an examination of his choice problem and of his means or opportunities for solving this problem. To this approach is opposed that which starts from the presumption that some unit larger than the single person ... is the entity whose choice problems are to be examined (1962: 315; italics in original).

Organizations do not have preferences, and do not choose in the conscious and rational sense that we attribute to people. Anyone who has served on committees understands this fact. Usually no single person on a committee has the power to choose the outcome, and the choices that result from committee processes seldom resemble anything like the reasoned choice of a single individual (1983: 327).

Methodological individualism is a key pillar of my attempt to understand policymaking within firms. I trace the Type 2 policies (institutions) of firms (organizations) to preferences of managers. As a result, I view firms' policies as purposive artifacts,²⁶ and institutional change (policy adoption or non-adoption) as a process that is affected both by the extant structures at any point in time, and the preferences and strategies of actors (Schelling, 1978; Arrow, 1987, E. Ostrom, 1996).²⁷ However, actors cannot always modify or create new institutions since institutional change is affected by a variety of factors such as 'path-dependency,' transaction costs, and the rules used to change rules (North, 1990; E. Ostrom, 1990).²⁸ Even Type 1 policies (that increase monetary profits or decrease monetary costs) may initially be impeded by managers who are skeptical of the utility of adopting

²⁶ Both the neoclassicalists and the new-institutionalists assume methodological individualism. However, the former contend that markets evolve spontaneously. The Austrian School, particularly Hayek (1945), also rejects "constructive rationalism;" he suggests that institutions cannot be constructed based on a rational design. Evolutionary economists also do not treat institutions as purposive artifacts (Nelson and Winter, 1982). Sociologists or the interpretivist institutionalists, in contrast to new-institutionalist, contend that institutions evolve exogenously to the actors (Keohane, 1988). This distinction is crucial as both the new-institutionalists and the interpretivists view institutions as exogenous constraints on human action. However, the new-institutionalists view some institutions as potentially purposive artifacts while interpretivists do not relate institutions to purposive human action.

²⁷ As subsequently discussed, endogeneity or exogeneity depends on the level of analysis and the time frame (E. Ostrom, 1990; Snidal, 1995; Martin, 1995).

²⁸ Williamson (1975, 1986), in tradition of Commons ([1934] 1961)), treats a transaction as the unit of analysis. E. Ostrom (1990) also uses the action arena as her unit of analysis. On this count, these scholars treat agents and structure as inseparable in understanding human behavior.

environmental policies.

Pursuit of Self-Interest

Actors, alone or in groups, are assumed to pursue their self-interests subject to institutional constraints.²⁹ Furubotn and Richter note that:

Contrary to conventional practice, the dichotomy between the theory of consumer choice and theory of firm is ended by extending the utility maximization hypothesis to *all* individual choices. Thus, an individual, whether he be the manager of a government bureau or a capitalist entrepreneur, is understood to make his own choices and to pursue his own goals within the limits allowed by the system in which he is operating (1991: 4; italics in original).

Self-interested actors may pursue profit and non-profit objectives. Since such actors may not always succeed in gaining the highest level of joint net benefits, institutions may generate pareto-inefficient equilibria.³⁰ Institutions may also serve the interests of dominant actors and represent distributional conflicts (Libecap, 1989; North, 1990; J. Knight, 1992).

²⁹ As a result, principal-agency notions are critical in understanding behaviors of composite actors (Berle and Means, 1932; Manne, 1965; Ross, 1974; Jensen and Meckling, 1975; Fama, 1980; Moe, 1984). However, in this dissertation, I do not examine principal-agency issues relating to beyond-compliance policies. Further, some scholars do not view principal-agent conflicts to significantly impact working of firms. Stigler (as cited by North, 1987) sees little relevance of agency issues in the study of firms. Manne (1965) argues that markets for managers substantially control 'agency costs' (Wolf, 1979). Demsetz and Lehn (1985) cite evidence suggesting that organizations with widely dispersed ownership (high principal-agent conflicts) as well as with concentrated ownership (low principal-agent conflicts) have comparable levels of profits.

³⁰ The Prisoners' Dilemma Game being an eloquent example.

Bounded Rationality

Actors are assumed to be 'boundedly rational' -- "intendedly rational but limitedly so" (Simon, 1957: ix). Bounded rationality reflects information scarcity at the level of an individual actor. In the study of social systems, Eggertsson (1996) identifies three types of information issues: (1) problems in creating and gathering information; (2) neurological constraints in absorbing and processing information; and (3) imperfect models of the external world that limit useful applications of processed information.

The first is a systemic constraint since it is practically impossible to collect perfect and complete information on every subject. For example, within the field of atomic physics, Heisenberg's Uncertainty Principle states that it is impossible to simultaneously and accurately determine the momentum and the location of a subatomic particle. This reflects technological constraints in gathering information on a given kind of subatomic phenomenon. In contrast to issue (1), issues (2) and (3) signify individual-level constraints; therefore, I am of the view that only (2) and (3) together reflect bounded rationality.³¹

What are the implications of bounded rationality? For Simon (1957), bounded rationality implies that actors: (1) use rules-of-thumb or standard operating procedures (such as capital-budgeting) to make decisions in repetitive situations, and (2) "*satisfice*" rather than *maximize*. Although satisficing may correctly describe human behavior, it is difficult

³¹ By bounded rationality I do not imply that actors are unclear in their preferences and strategies, and are paralyzed by inaction. Rather, actors often believe that they know enough about a subject to take self-assured actions, even though this self-assurance may not be completely justified. Consequently, actors make mistakes. A second order question is whether actors recognize their mistakes, distill learnings from them, and incorporate these learnings into their future preferences, strategies, and models of external world.

to operationalize. Some new-institutionalists therefore interpret bounded rationality as utility maximization under transaction cost constraints (Eggertsson, 1990).³² The maximization assumption requires that agents quantify payoffs of various strategies, weight them by their prior probabilities, and choose the strategy with the highest weighted payoff. However, this is not helpful in understanding the decision-making processes of actors pursuing objectives that do not meet the requirements of established procedures. Hence, I prefer a weaker assertion that actors do as well as they can, given their bounded-rationality.

Since boundedly rational actors may make decisions under uncertainty,³³ decision-making may be influenced by inter-agent interactions. When provided with new evidence or alternate interpretations for existing evidence, actors may revise their assessment of various policies. For example, opposing managers may change their assessment of a policy (for example, begin to view it as Type 1 instead of Type 2) if a credible actor were to present the existing cost or revenue data.

The IAD Framework

To structure my analysis of environmental policymaking within firms, I employ the Institutional Analysis and Development (IAD) Framework developed by the scholars at the

³² To reiterate, bounded rationality is an attribute of the individual actor and not of the structure of the decision situation. Since information asymmetries that lead to moral-hazard and adverse-selection problems are rooted in the structure of the situation, they do not represent bounded rationality. Adverse selection problems arise due to pre-contract information asymmetries while moral hazard problems arise due to post-contract information asymmetries.

³³ Unlike risky situations, we cannot spell out the probability of occurrence or non-occurrence of uncertain situations.

Workshop in Political Theory and Policy Analysis (Kiser and Ostrom, 1982; E. Ostrom, 1986, 1990; E. Ostrom et al., 1994). Policy scientists have long debated whether policies drive politics or vice-versa (Lowi, 1964), whether structures drive policies or vice-versa, and whether institutions are endogenous or exogenous to actors. Such debates may be resolved once we specify the level of analysis for a particular question.

The level of analysis can be viewed either as a hierarchical attribute or as a structural attribute of the *problematique*. The former route equates levels of analyses with hierarchy since hierarchically differentiated agents (such as senior managers, middle managers, and junior managers) have different job responsibilities and varying access to resources. In the study of International Relations, Waltz (1979) identifies three levels of analyses: the individual, the state, and the international system.

In contrast to the hierarchical route, the structural route relates levels of analyses to attributes of the *problematique*. Employing the structural route, the IAD framework identifies three nested levels of institutional analysis: operational-, collective-, and constitutional-choice (Kiser and Ostrom, 1982). Operational-choice level rules directly impact actors who make decisions affecting the physical world. Collective-choice level rules, or 'policies,' specify how operational rules may be changed, and who may change them. Constitutional-choice level rules specify how collective action entities (policymaking bodies) may be constituted, define membership rules, and describe how members may amend collective-choice level rules.

To exemplify, suppose the Board of Directors (BOD) of a firm decides to establish an environmental department to handle the firm's environmental affairs. This is a

constitutional-choice decision since a collective-choice structure (the environmental department) is being created. The environmental department may put together a manual specifying: (1) the responsibilities of various managers; (2) a protocol for environmental audits; and (3) a protocol for risk assessment. Since audits impact the functioning of facilities (the physical world), the audit protocol specifies operational-choice level rules. Suppose this protocol specifies weekly monitoring of emissions but facility managers want monthly monitoring instead. The collective-choice level rules outlining the procedures necessary to amend this protocol, will often be specified in the manual. Thus, the manual will specify the collective-choice rules (how to amend a protocol) and the operational-choice rules (periodicity of monitoring).

Though senior managers have greater involvement in collective- and constitutional-choice level decisions, they often have operational responsibilities as well. If, for instance, every quarter a Chief Executive Officer (CEO) must report on the firm's performance to the BOD, then organizing such a presentation becomes an operational responsibility of the CEO. Similarly, junior managers may also have constitutional-choice level responsibilities. Suppose, a junior manager at a facility is asked to manage a firm's environmental awareness programs. This manager may form a citizen committee to finalize the agenda, a constitutional-choice level decision involving this manager.

As suggested before, the IAD framework identifies three nested levels of institutional analysis. The constitutional-choice level institutions set rules for the collective-choice level, and the collective-choice level institutions, in turn, for the operational-choice level. At the constitutional-choice level, where domains of rule-making responsibilities are established,

politics drives the creation of structures and policies. In self-managed institutions, since actors themselves decide on constitutional-choice issues, constitutional-, collective-, and operational-choice institutions become endogenous to actors. However, if the constitution is imposed by external actors, then constitutional-choice rules become exogenous to actors.

Consider the previous example of establishing an environmental department. Firms' constitutions are determined by the prevailing laws and regulations (exogenous factors) and directed by their shareholders and managers (endogenous factors). Suppose the BOD, which represents the shareholders, decides to establish an environmental department at the head-office. This is a constitutional-choice decision endogenous to the shareholders. Suppose the BOD empowers this department to make environmental policies. Since the environmental department will decide policies for various facilities, policies (collective-choice institutions) are endogenous to the environmental department, but exogenous to facilities. If an auditor has to be identified by facilities, then this operational-choice level institution is endogenous to them. However, if this is decided by the environmental department, then this decision is exogenous to facilities. This discussion is summarized in Table 2.2.

[Insert Table 2.2 About Here]

Many policy analysts tend to equate governance with government, and treat governance institutions as exogenous to the governed. Historical-institutional economists also focus primarily on order guaranteed by external agents, either established by the governmental law, or by custom (Furubotn and Richter, 1991). They overlook what

Williamson (1975, 1985) calls “private ordering.” While focusing on policymaking (collective-choice) and policy implementation (operational-choice), policy scientists have largely ignored the issue of constitutional-choice: the conscious establishment of governance institutions such as firms. As a result, they “black-box” composite actors such as firms and disregard their internal dynamics.

In contrast, the IAD framework emphasizes that policy analysis deals with the issues of governance, not merely government, and that governance institutions can be crafted by actors whose behavior they are expected to regulate and stabilize. Using the IAD framework and the theories of firms, I seek to open the black-box and understand environmental policymaking within firms.

Nature of Goods and Services

Adam Smith ([1776] 1970) viewed the “invisible hand” as a mechanism to harmonize individual and collective interests when exchanges of private goods and services are organized in competitive markets. However, markets may fail when substantial externalities are present. In trying to deal with such market failures, individual and group rationality may conflict leading to collective action dilemmas or social traps (Arrow, 1963; Olson, 1965; Hardin, 1968; Platt, 1973; Stein, 1982; Cross and Guyer, 1980; Mueller, 1989; E. Ostrom, 1990). If actors pursue their short-term self-interests, then the group arrives at a socially non-optimal situation. A socially optimal outcome can be achieved only if actors suppress their short-term self-interests.

Collective action dilemmas can be traced to the physical and institutional nature of

goods and services (henceforth referred to as products). Products may initially be classified along two attributes: rivalry or subtractability and excludability (V. Ostrom and E. Ostrom, 1977). Rivalry implies that if A consumes a particular unit of a product then B cannot. However, some products may exhibit congestibility: non-rivalry if the number of consumers is below a given threshold, and rivalry if it is beyond that threshold.

Excludability implies that it is both technologically feasible and economical for A to exclude B from appropriating benefits, once a product has been produced. Excludability, reflecting the ease of defining and enforcing property rights, is influenced by both physical and institutional factors.³⁴ As Coase (1960) notes, a major problem with the Pigouvian approach³⁵ is the flawed conception of a factor of production that focused only on physical aspects, and ignored institutional contexts defining property rights. Coase observes that:

[A factor of production] is usually *thought of as a physical entity* which the businessman acquires and uses (an acre of land, a ton of fertilizer) *instead of as a right to perform certain physical actions*. We may speak of a person owning land and using it as a factor of production, but what the landowner has in fact possessed is the right to carry out a circumscribed list of actions. The rights of a land-owner are not unlimited (1960: 35; italics mine).

As illustrated in Table 2.3, based on physical and institutional contexts, products can

³⁴ This is another example of agents creating structures, which, in turn, constrain agents' actions.

³⁵ Pigou ([1932] 1960) viewed pollution as externalization of costs to the environment. Consequently, social costs exceed private costs creating incentives for over-production of the product. Pigou argued that governmental interventions, through the imposition of indirect taxes or provision of subsidies, could correct the discrepancy between private and social costs, and can force "polluters" to produce at socially optimal levels. Though Smith ([1776] 1960) did acknowledge the public good provision function of governments, Pigou provided an additional rationale -- internalization of externalities. I submit that Keynes (1937) at the macro economic level, and Pigou at the micro economic level, laid the foundation of the so called "interventionist state."

initially be classified in the following stylized categories.

[Insert Table 2.3 About Here]

Pure public goods are non-rival and it is difficult to exclude actors from appropriating their benefits. In contrast, private goods are rival and easily excludable. Common-pool resources are rival, but it is difficult to exclude actors from appropriating their benefits. Club and Toll goods are partially rival (congestible) and easily excludable.

Public goods are specific to the jurisdictions that provision them. We can think in terms of local public goods (street lights), national public goods (national defense), and global public goods (protecting stratospheric ozone). However, public goods may create externalities for jurisdictions that are not provisioning them.

Categorizing products is important since these categories represent different types of collective action dilemmas. If actors cannot be excluded from partaking the benefits of a product, they have few incentives to contribute to the product's provision. Difficulties in excluding create incentives for 'free riding' (Olson, 1965) leading to under-provisioning of the product (E. Ostrom et al., 1994). Since markets elicit contributions towards provision through the threat of exclusion, they are ineffective in providing non-excludable products, and some alternative institutional mechanism is required (E. Ostrom, 1990).

Rivalry in consumption leads to a different category of problems; it creates incentives for overuse and rent-dissipation (E. Ostrom et al., 1994). If a product is highly rivalrous and easily excludable (a private good), then its over-consumption is checked through a rise in its

price. However, if exclusion from a highly rivalrous product (a common-pool resource) is difficult or costly, then markets do not function effectively, and scarcity does not translate into a higher price. Unless there are counter-acting institutions, there is over-consumption leading to degradation of the resource. Again, non-market institutions are necessary to ensure sustainable use of such resources.

Scholars often assume that governmental provision is necessary for non-rival/congestible goods. However, congestible and easily excludable goods (impure public goods) can be provided by non-governmental organizations as well (Cornes and Sandler, 1986). Such goods are of two kinds: toll and club.³⁶ The former can be provisioned by levying a user toll. Consumers, paying for every additional unit, reveal their preferences, and one can conceivably think of a continuous demand-schedule for each consumer.

In contrast to toll goods, we cannot price the discrete consumption units of club goods. As a result, their provision is financed by membership fees. Industry-level initiatives such as Chemical Manufacturers Association's (CMA's) Responsible Care (Chapter 6) and ISO 14000 (Chapter 7) are examples of club goods since one cannot price the discrete units of 'goodwill' benefits for the firms generated by such initiatives.³⁷ Firms will have incentives

³⁶ The concept of an 'impure public good' was popularized by Buchanan (1965) though its application can be found in works of Frank Knight (1924), Pigou ([1932] 1960), Tiebout (1956), Wiseman (1957), and Olson (1965). I am indebted to Brenda Bushouse for highlighting the distinction between club and toll goods.

³⁷ Commons notes that:

Goodwill Value, the value added by the "skill, diligence, fidelity, success and reputation," ... as a use value this is indicated in the superior treatment above that of the competitors As an exchange value this goodwill value constitutes unprivileged intangible asset ([1924] 1968: 199; italics in original).

to pay their membership fees, only if such benefits are made excludable. Membership fees can take various forms. Consider the case of ISO 14000. Here the membership fee includes the costs of implementing environmental management systems and hiring experts to certifying them. The 'fee receipt' conferring the goodwill benefits takes the form of an ISO 14000 certification. For Responsible Care, the membership fee takes the form of implementing new organizational policies such as community outreach programs. Since CMA makes it mandatory for members to subscribe to Responsible Care, membership to CMA constitutes the fee receipt.

As discussed previously, my theoretical puzzle is: why Type 2 policies are adopted at all, and why only selectively? Type 2 policies create several joint-benefits.³⁸ First, by reducing pollution, they create benefits for citizens at large. Since these benefits are akin to public goods, firms cannot charge for their provision. Second, these policies generate goodwill towards firms among regulators, citizen groups, local communities, and financial institutions. In addition to difficulties in monetizing them, these benefits have the characteristics of public goods. Consequently, firms have few incentives to provide them.

"Green products" (Chapter 9) may also represent firm's attempts to transform benefits of environmental protection from public to private goods. If consumers are willing to pay a premium for green products (and have the satisfaction of being environmentally

He adds:

But goodwill, being a social relation, implies reciprocity. It is the expectation of reciprocal beneficial transactions. It presupposes a contract, express or implied from the behavior of the parties, requiring a compensatory service ([1924] 1968: 206-207).

³⁸ The notion of joint-products is discussed in Cornes and Sandler ([1986] 1996).

responsible), then firms can offset additional costs of adopting Type 2 policies. However, firms do not adopt this route *en masse* since it transfers collective action dilemmas from firms to consumers. Rational consumers may want to enjoy benefits of a clean environment (from which they cannot be excluded) without paying for them. If such defections are widespread, then markets for premium green products would remain small, and firms pursuing profits would have few incentives to adopt Type 2 policies.

Type 2 policies also generate goodwill for firms. To transform non-excludable goodwill benefits to club goods, industry-level institutions may be required. Initiatives such as the Environmental Protection Agency's (EPA) 33/50 program (Chapter 5), and CMA's Responsible Care (Chapter 6) fit into this category. Through Responsible Care, the CMA seeks to generate goodwill for the chemical industry, particularly for its members. To ensure that its members do not free-ride, the CMA *requires* that all its members subscribe to Responsible Care. Similarly, firms adopting ISO 14000 management systems will get the ISO certification conferring goodwill benefits to them. This again transforms goodwill benefits from a public good to a club good.

Goodwill benefits could also be transformed to private goods. For example, financial institutions' (such as mutual funds, insurance companies, and pension funds) may reward "green firms" that adopt Type 2 policies. However, as Schmidheiny and Zorraquin (1996) point out, since the primary objective of financial institutions is to maximize shareholders' wealth, most of them would probably penalize firms that adopt Type 2 policies. Collective action dilemmas are now at the investor level: rational investors may desire the benefits of a clean environment (from which they cannot be excluded) without paying for them. Since

“green investors” constitute only a niche market for investment funds investing in “green securities” only, “green funds” remain peripheral players in financial markets.

Policymaking Within Firms

Most new-institutionalists predominantly focus on efficiency- or power-based perspectives to explain institutional emergence and change. Along with these two categories of theories, I also employ leadership-based theories to examine internal behaviors of firms. These three theories are discussed below.

Efficiency-Based Theories

Efficiency-based theories view hierarchical firms as conscious artifacts to overcome market failures such as information asymmetries between actors, production externalities inherent in any team effort, and non-competitive factor markets that create the potential for opportunism (Coase, 1937; Chandler, 1962, 1977; Manne, 1965; Alchian and Demsetz, 1972; Williamson, 1975, 1985; Jensen and Meckling, 1976; Klein et al., 1978; Goldberg, 1980; Fama, 1980; Teece, 1982). Since the literature on efficiency-based theories is vast, I briefly discuss contributions of two scholars: Coase (1937, 1988, 1993) and Williamson (1975, 1985). These scholars view firms as efficiency-enhancing governance structures that economize on transaction costs.

The neoclassical theory treats firms as unitary actors (Hirshleifer, 1988). Consequently, it does not illuminate how managers within firms make decisions, why do they make certain decisions, and how such decision-making impacts firm-level outcomes.

Consequently, neoclassicalists do not explain an important puzzle: why firms arise at all? That is, why and how managers arrive at 'make or buy' decisions: should a value-addition activity take place within a firm or should it be contracted out?

In contrast, Coase emphasizes transactions costs as key factors in the emergence of firms, and therefore in influencing 'make or buy' decisions. Unlike neoclassicalists, he treats firms as composite actors organized as hierarchical teams. Coase criticizes the neoclassical theory in the following terms:

[It assumes] that the consumer is not a human being but a consistent set of preferences. The firm is defined as a cost and a demand curve. The theory is simply a logic of optimal pricing and input combination. Exchanges take place without any specification of its institutional settings (1988: 2).

In his 1991 Nobel Prize lecture, Coase further observed that:

[A]n economist does not interest himself in the internal arrangements within organizations but only in what happens on the market, the purchase of factors of production and the sale of the goods and services that these factors produce. What happens in between the purchase of the factors of production and the sale of goods that these factors produce is largely ignored The firm in mainstream economics has often been described as a "black box." And so it is. This is most extraordinary since most of resources in a modern economic system are employed within firms, with how these resources are used depends on administrative decisions and not directly on the operation of the market. Consequently, the efficiency of the economic system depends to a considerable extent on how these organizations conduct their affairs, particularly, of course the modern corporation. Even more surprising, given their [neoclassical economists'] interest in the pricing system, is the neglect of the market or more specifically, the institutional arrangements to a large extent what is produced, what we have is a very incomplete theory (1993: 228-9).

Coase departs from neoclassicalists on two counts. First, he acknowledges that market exchanges involve transaction costs. Second, he views firms as composite actors: hierarchies to consciously allocate resources by managerial fiat; an institutional response to economize on transaction costs. Hence, for Coase, firms are transactional entities, and not technological entities.

Coase is criticized for insufficiently explaining what influences the level of transaction costs: if transaction costs are the dependent variable, then what are the independent variables, and how they impact transaction costs?³⁹ Williamson (1975, 1985), building on Coase's ideas, provides a more developed theory to understand why transaction costs arise, and how they impact managerial 'make or buy' decisions.

Drawing upon Simon's (1957) notion of bounded rationality, Williamson emphasizes incomplete contracting since it is impossible to account for every contingency. He assumes that humans are potentially opportunistic; they pursue "self-interest with guile." He highlights the "fundamental transformation" (from competitive markets to a bilateral monopoly) in many repeated interactions due to "asset-specificity" -- the productivity of an asset is specific to certain persons and tasks. Asset-specificity makes asset owners vulnerable to labors' opportunism, and purchasers and suppliers vulnerable to each other. Since controlling opportunism through external enforcement ("legal centralism") is costly, actors

³⁹ That is, what are the coefficients of the independent variables.

create hierarchies to control opportunism internally at lower transaction costs.⁴⁰ Thus, firms are hierarchical governance structures to manage interdependence among economic actors.

For Williamson, if transaction costs are dependent variables, then asset-specificity is the most significant independent variable.⁴¹ Williamson's theory therefore leads to a falsifiable proposition: given opportunism and bounded rationality of managers, the higher the degree of asset-specificity, the greater the "make" decisions compared to "buy" decisions. Williamson also discusses institutional devices such as "hostages" and declarations of binding intent employed by actors to create disincentives for opportunistic behavior.

Williamson is criticized for insufficiently explaining how managers operationalize asset-specificity and opportunism (Dugger, 1983; Dow, 1987; Kay, 1992; Ghoshal and Moran, 1996; Roberts and Greenwood, 1997). Critics contend that therefore he provides insufficient guidance for measuring transaction costs. As a result, it is difficult predict *ex ante* whether managers would favor 'make' or 'buy' for a specific policy.⁴²

⁴⁰ Williamson predicts that managers would respond to labors' opportunism by superseding markets and undertaking value-addition activities within firm. However, one could argue the opposite as well: managers contract out to minimize costs of labors' opportunism in form of strikes. Consider the recent trends in the U.S. auto industry. The Big Three are responding to labors' opportunism by contracting out. I am not arguing that Williamson is incorrect. I submit that he is insufficiently focusing on institutions that mediate between the potential of labors' opportunism and managerial perceptions of the costs of such opportunism. In the previous example, these institutions are the established mechanisms of collective bargaining that privilege the United Auto Workers as the sole representative of workers. As a result, the Big Three have responded to UAW's opportunism not by increasingly making components in-house as Williamson would predict, but by out-sourcing it.

⁴¹ Chandler (1962, 1977) also views modern industrial enterprises as efficiency-enhancing governance structures. His notion of transaction costs is restrictive (or more precise) compared to that of Williamson's. Chandler focuses only on the reduction in administrative costs of coordinating resource flows in manufacturing when the production technology permitted mass production of standardized products for national as well as international markets. Further, Chandler does not relate transaction costs to opportunism due to asset-specificity.

⁴² Consider two policies. The first one is predicted to generate a higher level profits but requires a greater amount of asset-specific investments where as the other one is predicted to generate a lower level of

Critics also suggest that as a key behavioral assumption, opportunism is a bad descriptor and predictor of human behavior. It may also turn out to be a self-fulfilling prophecy (Ghoshal and Moran, 1996). As discussed previously, opportunism is deceitful utility maximization. Self-interested utility maximizers are assumed to be constrained by rules and norms; opportunists may not be constrained, especially if rules and norms are ambiguous. If actors were not opportunistic, unforeseen contingencies could be resolved *ex post*, and bounded rationality would pose little problem in contracting. Since actors *may be* opportunistic, and it is costly to *ex ante* separate the opportunists from the non-opportunists, Williamson assumes that all actors are opportunistic. Some scholars, however, view opportunism as potentially constrained by rules and norms (E. Ostrom, 1990, 1996).⁴³

To summarize, Coase and Williamson view firms as efficiency- and profit-enhancing governance structures. My inference is that these theories predict that managers would adopt

profits but requires lesser asset-specific investments. Which of these policies will be chosen, and whether we have an “objective” criterion to assess these options? My hypothetical example has real world implications. Take the U.S. car industry that is characterized by significant asset-specific investment and hence is vulnerable to labor’s-opportunism. Given the relatively poor state of industrial relations in the U.S. car industry, there is debate on the relative merit of two investment approaches: invest abroad where workers are not well trained but unionization is a non-issue versus invest in the U.S. where workers are better trained but unionization is higher. The response of various car firms has varied on this issue. This does not suggest that their managers are irrational. Rather, I submit that this suggests that managerial perceptions of the relative costs of “asset-specificity,” and not some “objective criteria”, is important in assessing which of these policies would be more efficient.

⁴³ Can the above views be reconciled? Williamson (1985) assumes that actors have opportunistic *attitudes* and examines how opportunistic *behavior* may be mitigated by offers of hostages and collaterals, public declaration of binding intent, and increases in frequency of transactions. However, E. Ostrom (1990, 1996) treats such devices, along with rules and norms, as intrinsic to an assessment of the degree of opportunistic attitudes or the likelihood of encountering opportunistic behavior. For her, rules and norms may *transform both behavior and attitudes* of many, but not necessarily all, participants. Probably, the optimal contract design for a given institutional context recommended by both scholars will be similar. Both agree that rules and norms mitigate opportunistic behavior even though they incorporate the mitigating effects in different stages (Williamson in the behavior stage, and E. Ostrom in the attitude as well as behavior stages) of their assessment of the degree of opportunism. I thank Tjip Walker for helping me clarify this issue.

policies requiring large investments only if such policies could be demonstrated *ex ante* as being profitable. That is, such policies would satisfy the requirements of capital-budgeting or other established procedures of investment analysis. Adopting Type 2 policies that involve significant outlays without an *ex ante* quantification of their profit impact is therefore inconsistent with the view that firms are efficiency-enhancing structures. Further, efficiency-based theories are not helpful in specifying an *ex ante* objective criteria to assess the profit impact of Type 2 policies that do not require up-front capital expenditure.⁴⁴

*Capital-Budgeting*⁴⁵

I have suggested that to cope with uncertainty about future costs and revenues, and to impart objectivity to investment analysis, managers adopt procedures such as capital-budgeting. Predicting profits is difficult due to the bounded rationality of managers as well as uncertainty of variables exogenous to firms. Baumol describes capital-budgeting as follows:

Capital budgeting refers to investment decision-making procedures of business firms and other enterprises. The subject encompasses such topics as the selection of projects (which new factories, if any, should the company build), the timing of investment, the determination of the amount to be invested within any given time period, and the arrangements of the financial means necessary for the completion of the project. The calculations which are

⁴⁴ Further, *ex ante* profitable projects can result in *ex post* losses if market or regulatory conditions change in unanticipated ways. Similarly, projects that are not subjected to formal budgetary review may turn out *ex post* to be profitable.

⁴⁵ In public finance literature, capital-budgeting refers to an accounting procedure, and not an investment appraisal procedure. In this dissertation, capital-budgeting refers to the latter only.

appropriate for these decisions for the most part derive directly from the theory of capital However, there is an extremely important limitation which must be emphasized from the very beginning. Imperfect foresight into the future, risk, and uncertainty will for the most part be ignored because economists have not devised really effective methods of taking them into account in the analytical methods. Unfortunately, capital-budgeting is the one subject where we can least afford to abstract from limitations in our knowledge of the future, because, by its very nature, the investment decisions can only be justified in terms of their prospective effects ([1977]1982 : 597).

As a tool for investment analysis, capital-budgeting is well-established in U.S.-based firms. Most U.S.-based business schools teach it as a key managerial tool for investment analysis. For reference, I am attaching information on the MBA programs of leading business schools that confirm that capital-budgeting is indeed a standard tool that MBAs are required to learn (Appendix 2.1).⁴⁶

The two most popular capital-budgeting methods are the Net Present Value (NPV) method and the Internal Rate of Return (IRR) method. In the NPV method, managers make projections of costs and revenues emanating from the project over a 10-20 year period, and discount these cash flows by firms' cost-of-capital.⁴⁷ If the net present value of the discounted cash flows is positive, then such projects are deemed as being potentially profitable, and as a result, firms consider investing in them.

In employing the IRR method, managers identify the discount rate that equates

⁴⁶ I had extensively employed this tool for investment analysis when I worked as manager in Procter and Gamble.

⁴⁷ Broadly, cash flows equal net profits plus depreciation. Depreciation is added back to the equation since it is only an accounting cost, and not a cash outflow. Cost-of-capital is the cost of raising funds in the capital market; alternatively, the opportunity cost of investing funds in the next best alternative.

discounted benefits to discounted costs. If this discount rate is greater than the firms' cost-of-capital (also called the hurdle rate), then firms consider investing in such projects. The NPV and the IRR methods are similar but not identical.⁴⁸ Specifically, in the IRR method there can be multiple discount rates equating discounted benefits to costs.

Capital-budgeting is important because managers put forward their best estimates of benefits and costs emanating from a particular project. Such procedures enable them to cope with uncertainty, and to establish transparency and impartiality in the project appraisal process. Financial markets perceive this as evidence of firms' commitment to financial discipline. With active transnational mergers and acquisitions markets, managers have incentives to closely monitor the reaction of financial markets to firms' investment decisions.⁴⁹ Further, in many firms, compensation of top executives is linked to the price of a company's stock (the deferred payment compensation). Hence, managers have incentives (that is, the 'stick' of being taken over by another firm, and the 'carrot' of enhancing their earnings) to closely attend to the evaluation of financial markets of their firms' performances. Finance and accounting managers,⁵⁰ in particular, are major supporters of employing capital-

⁴⁸ Managers often do some sort of sensitivity analysis by varying projections of the expected costs and benefits. The most optimistic and most pessimistic forecasts are generated to test the financial robustness of a project. Since projects with the highest NPV may not be very robust, finance managers often have to make a judgement call.

⁴⁹ In 1996, the value of all merger and acquisitions in the US alone amounted to \$650 billion, about six times the 1988 level (*Wall Street Journal*, January 3, 1997). The clout of the financial markets is felt even by national governments. In the 1995/96 budget *impasse* between the Clinton Administration and the Republican Congress, Treasury Secretary Rubin painted a grim picture of financial markets punishing the U.S. government in the event it defaults on its financial obligations. According to some observers, this was an important factor for the Republican Congress in backing off from its threat to shutdown the federal government and limiting the government's ability to borrow money for meeting its financial obligations.

⁵⁰ These managers often define their professional identity as the safeguarders of their firms' financial health.

budgeting to assess project viability. Deviations from this practice are rare, especially if projects involve millions of dollars.⁵¹

Type 1 policies involve capturing the “low-hanging fruit”: projects that are potentially profitable if new policies were to be adopted. Since such reductions in costs or increases in profits are monetizable, Type 1 policies match or exceed profit criteria as required in capital-budgeting. Hence, efficiency-based theories predict that Type 1 policies will be subjected to capital-budgeting, meet or exceed the established criteria, and get adopted.

As discussed previously, managers cannot or do not employ established procedures to estimate *ex ante* the profit impact of Type 2 policies. Thus, efficiency-based theories predict that firms will not adopt Type 2 policies since they cannot be justified on the basis of established investment appraisal procedures. On this count, the predictions of both efficiency-based theories and neoclassical economic theory are similar. Neoclassicalists assume that firms will maximize profits while efficiency-based theories predict that firms will economize on transaction costs, and firms will adopt only those policies that are efficiency-enhancing. I therefore expect that Type 2 policies would be opposed by policy-skeptics who favor only those policies that meet or exceed the *ex ante* profit criteria. The puzzle then is: why Type 2 policies are adopted at all, and why only selectively? Since efficiency-based theories do not address this puzzle, I employ alternative theories.

⁵¹ This also acts as a self-fulfilling prophecy. Finance and Accounting managers act as if financial markets are closely scrutinizing their firms' financial performance; large expenditures therefore must be subjected to capital-budgeting.

Two Notions of Efficiency

Let me differentiate between two notions of efficiency: substantive and procedural efficiency⁵². By substantive efficiency I mean that efficiency is an attribute of the final outcome or the end-state. For example, if firms are efficient structures, then policies of firms (final outcomes) should possess desirable attributes that reflect efficiency: attainment of certain levels of profits.

By procedural efficiency I mean that efficiency is an attribute of the procedures adopted by actors to pursue certain goals; it is not an attribute of the end-state. Thus, if managerial behavior is guided by procedures that seek to maximize profits, then such behaviors are procedurally efficient.

What if such intendedly efficient procedures do not result in efficient outcomes; that is, although managers adopt procedures to maximize profits, the consequent policies do not generate adequate profits. Would then procedural and substantive efficiency be in conflict? There are two types of responses to this issue: systemic-level and firm level. Systemic-level explanations suggest that competitive markets would weed out firms that do not meet the criteria of substantive efficiency (Alchian, 1950). Thus, only those firms would survive whose procedural efficiency does not conflict with market-driven substantive efficiency. Such systemic explanations are attractive since they do not require us to make assumptions about the rationality or the lack of it of managers or firms (Eggertsson, 1990).

Manager-level or firm-level explanations also suggest that for substantive rationality

⁵² This parallels the distinction between procedural and substantive rationality.

to remain a desirable goal for managers, unprofitable firms and their managers should get punished. However, these explanations view this market feedback to create incentives for managers (who are assumed to be self-interested actors and doing as well as they can) to modify their extant procedures, and make them deliver better on goals of substantive efficiency. On this count, substantive efficiency would significantly impact procedural efficiency through market feedback and managerial learning.

Since neoclassical economics is highly useful in predicting systemic-level outcomes in competitive markets, I interpret it as focusing only on substantive efficiency. As discussed previously, the neoclassical theory does not provide much guidance to operationalize procedural efficiency; it assumes that firms and their managers maximize profits without sufficiently explaining how they actually do this difficult task.⁵³

In contrast to the neoclassical theory, efficiency-based theories focus on procedural efficiency. By explicitly assuming that managers seek to minimize transaction costs (a procedural guideline), they illuminate our understanding of the internal processes of firms. Specifically, the efficiency-based theories of Coase and Williamson provide theoretical explanations for why and how managers arrive at 'make or buy decisions.' However, as discussed previously, these theories do not adequately explain how managers measure transaction costs *ex ante*. Although Williamson explicitly acknowledges the bounded rationality of managers, he does not explain what procedures managers employ to deal with

⁵³ We are told that firms equate marginal revenues with marginal costs. However, we are not told, how marginal revenues or costs are estimated. It is assumed that managers have full information on these subjects. I think this is a useful way of thinking about decision-making processes. However, they provide insufficient guidance to understand actual managerial behavior.

their bounded rationality.

This dissertation is a modest attempt to operationalize the notion of procedural efficiency by explicitly linking it to capital-budgeting. Since, capital-budgeting is indeed a well-established and widely employed tool of investment analysis, this reinforces the argument that firms and their managers attempt to be procedurally efficient. As a result, any deviations from these established procedures (such as adopting Type 2 policies) is puzzling, and worthy of examination.

My theoretical puzzle is different from that of efficiency-based theorists. I am not examining how managers arrive at ‘make or buy’ decisions. Instead, I seek to understand why firms adopt Type 2 policies at all, and why only selectively. I have taken the broad message of efficiency-based theories that firms are procedurally-efficient governance structures, and I am only examine exceptions to this practice. My dissertation should therefore not be viewed as a general critique of efficiency-based theories.

Power-Based Theories

Institutions may not always arise to internalize efficiency gains; they may represent distributional conflicts (Marx and Engels, [1848] 1970; Marglin, 1974; Edward, 1979; Perrow, 1979; North, 1981, 1990; Putterman, 1984; Libecap, 1989; J. Knight, 1992). Knight observes that:

[T]he ongoing development of social institutions is not best explained as a Pareto-superior response to collective goals or benefits but, rather, as a by-product of conflicts over distributional gains (1992: 19; italics in original).

Marx and Engels proclaim that:

The history of all hitherto existing society is a history of class struggles. Freeman and slave, patrician and plebeian, lord and serf, guildmaster and journeyman, in a word, oppressor and oppressed, stood in constant opposition to one another, carried on an uninterrupted, now hidden, now open fight ([1848] 1970: 17; italics mine).

Firms, as structures for organizing value-addition, are viewed as embodying distributional conflicts, and radical scholars view them as instruments to dominate labor (Perrow, 1979, 1981) and facilitate accumulation (Marglin, 1974). Edwards (1979) acknowledges the coordination function of firms. However, since coordination can be achieved by tradition and peer-groups, he views firms more as instruments for bureaucratic control. Putterman (1984) questions the efficiency rationale for the emergence of firms since labor hiring capital has the same efficiency implications as capital hiring labor. Perrow also questions the efficiency rationale of hierarchies. According to him:

[I]nitially hierarchy and vertical integration were designed to obtain market control and oligopolistic advantages, rather than the advantages of efficiency. Once you have these goodies, you can realize certain kinds of efficiencies, though others are foregone. Then hierarchy and vertical integration were rendered inefficient by technological changes ... A less hierarchical form was quickly adapted, because it had other efficiencies. Gradually however, the dominant firms have moved back to more oligopolistic position because control, rather than efficiency, is the key issue (1991: 438).

If firms are organizations to serve the interests of dominant actors, policies of firms

should reflect domination of these interests. Consider Type 2 policies that represent conflicts between policy-supporters and policy-skeptics. For a Type 2 policy to be adopted, a power-based approach would predict that policy-supporters should be supported by hierarchically-senior managers. Hence, adoption of such policies reflect domination of “green managers.” If Type 2 policies are not adopted, we can again employ a power-based approach to examine whether policy-skeptics were supported by hierarchically-senior managers. If so, then we can interpret this as reflecting domination of policy-skeptics who prioritize pursuit of monetizable profits over Type 2 policies.

A power-based approach does not imply that policies produce no collective benefits (Knight, 1992). It may happen, *ex post*, that a Type 2 policy has actually increased profits. However, the production of such benefits was secondary to serving the interests of dominant actors, whether adoption or non-adoption of a Type 2 policy. As I discuss in the case studies (Chapters 4-9), benefits accruing to dominant managers may be non-monetary; perhaps in the form of having their vision on environmental issues adopted by policy-skeptics. However, it is also possible that policy-supporters may receive tangible benefits such as increased budgets for their departments. As Williamson (1963) argues in one of his earlier works, managers maximize utility functions that include variables such as status, salary, and prestige. It is conceivable that environmental managers have a vested interest in having Type 2 policies adopted since this often leads to increased budgets for their department and increased headcounts. This, in turn, creates promotional opportunities for them and also increases their prestige within the organization.

Adopting Type 2 policies through a power-based route is predicted to generate

conflict. Policy-skeptics will accept such policies not because they buy into their logic; rather, their acceptance represents the victory of hierarchical superiors (policy-supporters) over subordinates. As a result, policy-skeptics are not predicted to change their preferences (as reflected in their behavior) about the desirability of such policies. Their discomfort could manifest itself in a variety of ways such as expression of disagreement in meetings and non-enthusiastic implementation of the adopted policy. The level of opposition is influenced by factors such as their extent of disagreement with the policy and the fear of retribution.

Importantly, the level of opposition depends on the extent of organizational change required to implement a policy. If the change is significant, then “losers” are expected to have incentives to resist such change, and perhaps, power-based processes are then the only route to have such policies adopted.

Leadership-Based Theories⁵⁴

Similar to power-based theories, leadership-based theories also suggest that certain actors play key roles in creating or modifying institutions (Barnard, 1938; Follett, 1940; Boulding, 1963; E. Ostrom, 1965; Bass, 1985; Schein, 1985; Conger and Kanungo, 1988; Daft, 1992; Miller, 1992; V. Ostrom, 1997). However, unlike the dominant actors in power-based processes who impose their preferences, these managers are consensus -inducers.

⁵⁴ Leadership is a highly researched issue in organizational theory. Following the classification suggested by Luthans ([1975] 1995), leadership theories can be classified into the following categories: Trait theories (Reitz, 1987; Katz, 1974; Yukul, 1981); Group and Exchange theories (Barnard, 1938; Greene, 1975; Graen, et al. 1982) Contingency theories (Fiedler, 1967); Path-Goal theories (Georgopolous et al., 1957; House, 1971) Charismatic leadership theories (House, 1976; Bass, 1985); Transformational leadership theories; and Social Learning theories (Davis and Luthans, 1980).

Importantly, such consensus may not arise spontaneously (as in the Hayekian notion of spontaneous cooperation); interventions of leaders is required.

Leadership-based theories suggest that the presence of leaders is essential for firms to arise and function. This perspective of the nature of firms contrasts with Williamson's who views hierarchies as artifacts to economize on costs of labors' opportunism. However, Williamson's critics argue that managers may also behave opportunistically (hierarchical failure) by unfairly appropriating profits (Kreps, 1990). Firms cannot therefore be viewed simply as artifacts to mitigate market failures; the role of leadership is important. Miller notes that:

Managers face short term-incentives to choose inefficient incentive regimes for subordinates. Employees, knowing this, have no reason to trust the employers with information that would make it possible for the employers to make inefficient decisions. Hierarchy is thus a setting for a commitment problem. *The problem can be solved, but only through a set of strategies that are essentially political ... [and a] leadership style projecting trustworthiness and/or constitutional constraints on the political authority of the hierarchical superiors* (1992: 235; italics mine).

Simon also makes a similar point. He notes that once the contract has been agreed upon,

[I]f the worker had confidence that the employer would take into account his preferences ... [he] would be willing to work for a smaller wage than if he thought ... in the employer's exercise of authority and only profitability to the employer taken into account (1957: 192).

Though hierarchies seek to control market-failures, they are themselves susceptible to organizational-failures (Wolf, 1979). Instead of protecting profits, hierarchies may create

incentives for workers to understate their productive potential, and thereby reduce profits. Since such conflicts are caused by the fear of managerial opportunism, Miller (1992) suggests establishing institutions to minimize managerial discretion. By doing this, workers will have incentives to maximize their productivity. Interdependence among managers and workers now takes a new twist. Managers no longer attempt to perfect institutions and or technologies to minimize workers' opportunism. Rather, they seek to employ this interdependence to generate a consciousness enabling all actors to reassess their preferences.

Barnard (1938) suggests that managerial functions extend beyond organizing factors of production, devising appropriate incentive structures to minimize shirking, and writing contracts to guard against opportunism of the subordinates. The distinctive managerial function then is to motivate the employees to surmount their narrow, short-term self-interest.

The managerial interactions on adopting Type 2 policies are leadership-based if they reflect a conscious building of consensus by policy-supporters. Since these policies do not increase monetizable profits, or they create “losers” from organizational change, they are initially opposed by policy-skeptics. In the face of inter-manager conflict, I expect policies either to be shelved or get adopted by a top-management mandate. However, there is a third route as well. Policy-supporters may repackage such policies and enable policy-skeptics to reassess their impacts.⁵⁵ Instead of relying on monetizable profits as the sole criterion, policy-

⁵⁵ In terms of Follett (1940), this could be termed as “integration.” According to her, there are three routes for dealing with conflict: domination (similar to power-based processes), compromise (achieving middle ground without changing preferences; I have no parallel to it in this dissertation), and integration (involves changing for preferences). According to Follett, conflict could be constructive, if employed to achieve integration. In my discussion of leader-based processes, integration is being achieved since policy-skeptics revise their preferences on the desirability of Type 2 policies. Unlike, Follett’s conception where both parties change their preferences (what she calls “reciprocal adjustment”), I focus on changing preferences of policy-skeptics only.

supporters may suggest employing new criteria to assess the desirability of policies. Importantly, these new criteria are also portrayed to increase long-term profits of the firm though policy-supporters provide no quantifiable estimates of such benefits.

How are agendas transformed, deadlocks broken, and what is the role of leaders in this context? Ikenberry's (1993) study of the evolution of the Bretton Woods economic system is instructive on this count. According to Ikenberry, it is the interventions of policy-entrepreneurs at crucial junctures in the form of new ideas and new ways of conceptualizing interests, that break deadlocks, and provide a basis for building of consensus. He notes that:

Miracles aside, how does one explain the Anglo-American postwar settlement? Can a simple interest-based argument explain the settlement, or do we need to probe more deeply into the manner in which interests were defined, coalitions were forged, and power was legitimated in the aftermath of world war? I argue that we must probe deeply A set of policy ideas inspired by Keynesianism and embraced by groups of well-placed government specialists and economists was crucial in defining government conception of postwar interests, building a coalition in support of the postwar settlement ... these experts and their "new thinking" were important in overcoming political stalemate both within and between the two governments (1993: 58).

It appears that leaders adopt a variety of strategies to influence policy-skeptics. As I discuss later in the case studies (Chapters 4-9), these often involve impressing upon the skeptics of the long-term benefits of such policies. Further, the presence of a coercive

In terms of Boulding (1963), a leadership-based process could be classified as an integrative response: "[W]hich establishes a community between the threatener and the threatened and produces common values and common interests" (pp. 428). In the context of this dissertation, this can be interpreted as a policy outcome that establishes a shared understanding between policy-supporters and policy-skeptics on the desirability of a Type 2 policy.

external factor (such as the Environmental Protection Agency) that encourages such a policy imparts credibility to the arguments of the leaders. One would also expect that leaders rely significantly on communicating and sharing information, a tactic that has effectively been used by policy-supporters in Baxter. Thus, the provision of new information and framing of existing information in new contexts, may stimulate policy-skeptics to reassess their preferences as well as perceived benefits from adopting a Type 2 policy. Further, the personal credibility of leaders as consistent champions of particular issues, along with their expert knowledge about the issue area, is often important. If policy-supporters do not have sufficient professional expertise on particular issues, they could also bring-in outside experts to make presentations on their behalf to policy-skeptics on the desirability of adopting a policy.⁵⁶ Thus, leaders could adopt a variety of strategies to impress upon the skeptics to revise their assessments of Type 2 policies.

Predictions of Theories of Firms

To summarize, for understanding the intra-firm processes (such as capital-budgeting) and inter-managerial interactions (between policy-supporters and policy-skeptics) leading to the adoption or non-adoption of Type 2 policies, I have suggested employing three categories of explanations: efficiency-, power-, and leadership-based. I seek to understand the incentives (monetary as well as non-monetary) for individual actors for supporting or opposing Type 2 policies. I suggest focusing on actors that are involved in decision-making

⁵⁶ I have elaborated upon this strategy in my discussion on underground storage tanks (Chapter 4).

on environmental policies. Such actors may belong to various functional areas such as environmental affairs, finance and accounting, research and development or manufacturing depending on the policy under consideration. They may also belong to different levels in the organizational hierarchy though the role of top-management is of particular interest, especially for understanding power-based processes.

In this section, I outline the generic predictions of the three theories, and identify requirements to validate or invalidate their predictions. Efficiency-based theories suggest that firms will adopt policies that are predicted *ex ante* to increase monetizable profits. If policies require substantial capital expenditure (frequently \$1 million and above),⁵⁷ then they would be required to meet capital-budgeting requirements. Since firms are often viewed as efficient governance structures braving market competition, I first look for efficiency-based logic to explain adoption or non-adoption of environmental policies.⁵⁸ Further, even if firms are in oligopolistic markets, they are still perceived as being under tremendous pressure to make adequate profits, given the booming merger and acquisition markets.

Both the neoclassical economic theory and efficiency-based theories predict that Type 2 policies would not be adopted. Since some of them do get adopted, alternative

⁵⁷ The figure of \$1 million was suggested during my one-on-one meetings with managers at Baxter and Lilly. Some projects costing a few hundred thousand dollars may also be subjected to capital-budgeting. One expects that projects with big capital expenditures will demonstrate their financial viability by satisfying capital-budgeting requirements. Importantly, some projects do not or cannot meet these requirements, and this dissertation is a modest attempt to examine this puzzle.

⁵⁸ How does one assess degree of competition? Many measures have been suggested: number of firms in the industry; concentration ratios; and levels of industry profits benchmarked against other industries. All such measures though useful are insufficient. For example, even in industries with few firms, fierce competition could ensure competitive level of prices. A good example is the long-distance telephone market dominated by three players: AT&T, MCI, and Sprint. Fierce competition among these firms, coupled with relatively low-entry barriers, has ensured that consumers pay almost competitive prices.

explanations are required. Power-based theories suggest that for Type 2 policies to be adopted, they must have the support of senior managers. Similarly, as discussed subsequently in the case on Responsible Care (Chapter 6), one expects that Type 2 policies may not be adopted if senior managers oppose them.

Since the intervention of powerful managers results in adoption of such policies, one expects that policy-skeptics could resent getting overruled. Power-based processes are therefore predicted to generate covert and overt intra-firm conflicts. Opposing managers may capitulate, but still carry on guerilla-warfare. Thus, if a major project not satisfying capital-budgeting is adopted, I look for evidence of contestation. Policy-skeptics may exhibit their disagreement in a variety of ways such as slowing down policy implementation or even openly sniping at policy-supporters during meetings; they may greet reports on policy failures with cynical “I told you so” remarks. I observed such behaviors during my one-on-one interviews as well as in business meetings which I attended as an observer.

Leadership-based theories suggest that any policy, including Type 2 policies, would carry imprints of leaders; such policies would not have been adopted in the absence of their interventions. Thus, Type 2 policies may initially be opposed by some managers. But overtime policy-supporters may succeed in convincing skeptics that such policies indeed serve the long-term interests of their firms, and on that count, their interests as well. Such policies eventually are adopted by inducing consensus. Policy-supporters win over skeptics by making new information available to them on the potential benefits of the policy, by highlighting the need to keep the external actors encouraging such policies in good humor, by creating an organizational culture of environmentalism through devices such as regular

newsletters and conferences. In particular, the role of external factors that can inflict significant excludable costs or provide excludable benefits to firms as well as the managers, is critical in having policy-skeptics change their preferences.

I do not expect policy-skeptics to change their positions overnight; sustained canvassing by policy-supporters may be required. During my one-on-one meetings, one manager admitted that some of them were initially very skeptical about “throwing money down the drain” but the “tree huggers do have a point; this benefits us in the long-term.” Some Type 2 policies may require significant levels of organizational change at the collective- or constitutional-choice levels. This could create incentives for the “losers” from this change to oppose these policies. Consequently, inducing consensus may prove difficult. I therefore predict that such policies would be adopted, if at all, only through power-based processes.

Importantly, in both power- and leadership-based processes, policy-supporters portray Type 2 policies as the long-run profits of their firms. This is expected since the main objective of firms is the pursuit of profits, and it is difficult to visualize that policy-supporters will urge their firms to adopt policies that harm the firms' long-term interests. Although policy-supporters make claims about increases in long-term profits, they provide no estimates. This suggests that in some instances profit no longer remains an “objective” concept whose measurement is invariant across actors. I am not arguing that established procedures of project appraisal are irrelevant. They matter very much and that is why it is difficult for policy-supporters to justify why their pet policy should not be subjected to the formal rules of project appraisal. Importantly, such exceptions occur, and in this dissertation

I propose one way of examining the processes that lead to such exceptions.

In the next six chapters (Chapters 4-9), I employ efficiency-, power-, and leadership-based theories to examine ten cases of the adoption or non-adoption of Type 2 policies. Finally, in Chapter 10, I discuss the theoretical and policy implications of my research.

Table 2.1
Categories of Environmental Policies

Impact on Compliance --> Impact on Monetizable Profits	<i>Ensure compliance</i>	<i>Result in beyond compliance</i>
<i>Established procedures to assess profitability are employed and the policy meets or exceeds their criteria</i>	Type 4 profitable policies that are required by law; are implemented with low inter-manager conflict	Type 1 policies that involve profitable organizational changes with low inter-manager conflicts
<i>Either established procedures to assess profitability cannot be employed, or if they can be, then they were not employed</i>	Type 3 policies that are required by law; are implemented with low inter-manager conflict if there is stringent punishment for non-compliance and effective monitoring	Type 2 policies that involve inter-manager conflicts

Table 2.2
Endogeneity and Exogeneity in Environmental Policymaking

Unit of Collective Action Level of Institutional Analysis	<i>Board of Directors</i>	<i>Environmental Department</i>	<i>Facilities</i>
<i>1. Constitutional Choice:</i> BOD decides to establish an environmental department	Endogenous	Exogenous	Exogenous
<i>2a. Collective Choice:</i> BOD mandates environmental policies such as environmental audits of facilities	Endogenous	Exogenous	Exogenous
<i>2b. Collective Choice:</i> Environmental department decides to begin environmental audits of facilities	-	Endogenous	Exogenous
<i>2c. Collective Choice</i> Facilities decide to subject themselves to environmental audits	-	-	Endogenous
<i>3a. Operational Choice:</i> Environmental department identifies the auditors	-	Endogenous	Exogenous
<i>3b. Operational Choice:</i> Facilities identify the auditors	-	-	Endogenous

Table 2.3
The Nature of Goods and Services

Excludability Rivalry/Subtractability	<i>Easy</i>	<i>Difficult</i>
<i>Rival</i>	(1) Private Goods	(4) Common-Pool Resources
<i>Partially Rival or Congestible</i>	(2) Club Goods (3) Toll Goods	
<i>Non-Rival</i>		(5) Pure Public Goods

Source: Adapted from V. Ostrom and E. Ostrom (1977: 12)

Chapter 3

Baxter and Lilly

Evolution of Environmental Programs

The objectives of this chapter are threefold. First, I describe the evolution of the environmental function in Baxter and Lilly. Then, I briefly sketch their internal environmental policymaking structures. Finally, I compare these organizational structures.

This chapter should be viewed as a preamble to Chapters 4-9 where most of the key events in the evolution of Baxter's and Lilly's environmental programs are discussed as individual case studies. In this chapter I only describe how Baxter's and Lilly's environmental programs evolved at the firm level. I do not employ the various theories of firms to explain their evolution by examining preferences of managers on particular policies. This task is undertaken in Chapters 4-9. As a result, in this chapter I often do not identify key managers in the evolution of environmental policies or whether a policy caused conflict between policy-supporters and policy-skeptics.

Baxter: An Overview

Baxter International Inc. is a Deerfield, Illinois-based multinational corporation that develops, manufactures, and markets products and services used in hospitals and other health-care settings. On October 1, 1996, a part of Baxter International Inc. was spun off into an independent firm called Allegiance Corporation. As shown in Table 3.1 below, the 1995 net sales of undivided Baxter International Inc. (henceforth Baxter) stood at \$9.6 billion, and

research and development expenditure at \$351 million.⁵⁹

[Insert Table 3.1 About Here]

Baxter had five major business portfolios. The first four now constitute the (new) Baxter International Inc., and the fifth has been spunoff as Allegiance Corporation (Baxter, 1996):

- (1) Renal Division provides products and services for patients suffering from chronic kidney failure. Baxter pioneered hemodialysis in 1956 and is now investigating animal-to-human kidney transplants.
- (2) Biotechnology Group produces plasma derivatives, biotechnology, and blood-handling products and conducts research to treat blood diseases, cancer, and diabetes.
- (3) Cardiovascular Group provides products to fight late-stage heart and vascular diseases. It manufactures heart valves, valve repair products, cardiac monitoring systems, catheters, and equipment used in vascular surgery.
- (4) I.V. Systems/International Hospital Divisions manufacturer and distribute intravenous solutions and related products.
- (5) Hospital Management Business manufactures and distributes surgical and respiratory therapy products and offers services such as inventory management, customized packaging for surgical procedures, and identification of savings opportunities. This division has been spun off as Allegiance Corporation.

⁵⁹ Since this dissertation focuses on environmental policymaking in the undivided Baxter International Inc. during 1975-March 1996, the splitting of Baxter into two separate firms does not impact my research design.

Evolution of Environmental Programs

Baxter's environmental policies have passed through three phases. Baxter had a state-of-the-art environmental program in the late 1970s and the early 1980s. Its environmental programs began to backslide in the mid 1980s. The late 1980s marked the beginning of the third phase when Baxter revitalized its environmental programs. The top-management mandated that Baxter's U.S.-based facilities should establish a state-of-the-art environmental program by 1992 and facilities abroad by 1996. I elaborate on these phases below.

Baxter's environmental programs had got off an early start. By the mid 1970s, the senior management had recognized the importance of environmental issues, and there were discussions within the company about creating internal environmental institutions and organizations. In 1976, Baxter (known at that time as Baxter Travenol Corporation) established its environmental department. Since at that time environmental policies were viewed as having predominantly legal and technical dimensions, Ray Murphy and Don Nurnberg were transferred from Legal and Corporate Facilities Engineering departments respectively to Corporate Environmental Affairs.

For three reasons, 1977 constitutes a watershed in the evolution of Baxter's environmental programs. First, Murphy and Nurnberg organized Baxter's first ever company-wide environmental conference. This signaled to the whole organization the intent of the top management to emphasize environmental issues and to encourage the active participation of managers from its various divisions and facilities. An outcome of this conference was that environmental coordinators were appointed for all U.S.-based facilities. This laid the foundation of the facility-level infrastructure for developing and implementing

environmental programs.

Second, to institutionalize the momentum generated by this conference at the top-management level, a committee of senior executives -- the Environmental Review Board (ERB) -- was established to oversee and guide company-wide environmental programs. G. Marshall Abbey, Senior Vice-President and the General Counsel, was appointed the chairperson of the Board, a position he held until his retirement in 1992. Abbey, a lawyer by training, recognized the growing importance of environmental issues, and that Baxter needed to proactively establish a strong environmental program. Abbey found allies in other members of the ERB: D.G. Madsen and C.F. Kohlmeyer.⁶⁰

Third, the corporate environmental group developed Baxter's first environmental manual and began auditing facilities' compliance with the laws that were identified in the manual. Manuals are useful tools for auditing performance since they explicate the expectations and responsibilities of various positions in the organizational structure. Consequently, developing a manual was an important step in translating the intent behind creating new decision-making organizations (such as the ERB) into concrete policies.

Over the next few years as the responsibilities of the environmental function expanded, communication bottlenecks began to appear. Some managers felt the need to

⁶⁰ ERB's members represent many functional areas. The ability of the ERB to influence environmental programs depends on its formal and informal power. The status of its members, both within and outside the company, is a good indicator of such abilities. Since some ERB members are highly visible outside the company as well, the ERB has exercised enormous influence in shaping Baxter's environmental programs. For example, Charles Kohlmeyer, Vice President of Facilities Engineering and a member of the ERB, has held important positions in industry associations. He was Vice-President of Health Industry Manufacturers Association's (HIMA) Environmental Advisory Committee. HIMA is a Washington-based trade association representing about 300 manufacturers of healthcare technology. HIMA's member account for 90 percent of healthcare technology products in the United States (Baxter, 1992a). HIMA is an active player in the current health policy debates.

establish a source of information on new developments in corporate environmental policies; annual updates during the environmental conferences were not sufficient. Further, since new laws were being enacted at the Federal and state levels, there was also a need to have updates on how such laws may impact Baxter. As a result, in 1980, the corporate environmental group began publishing Baxter's internal environmental newsletter, *Travenol Environmental Newsletter*, edited by Ray Murphy.⁶¹

The late 1970s was a good time for Baxter. Its business was booming, profits were robust, and environmental regulations were relatively uncomplicated and easy to meet. In the early 1980s, the healthcare industry, facing a cyclical downturn, came under severe financial pressure. In a highly controversial move, both within and outside the company, The senior management responded to this exogenous development by merging with American Hospital Supply Corporation (AHSC) in 1985. It was one of the biggest mergers of that time with both the firms having sales volume of about \$3 billion each. The preoccupation with this stormy merger meant that Baxter's senior managers had less time to devote to 'soft-areas' such as Baxter's environmental programs. For example, in rushing through the merger, they did not correctly appraise AHSC's environmental liabilities. AHSC did not have a strong environmental program; in contrast to eleven managers in Baxter's corporate environmental department, AHSC had only one. However, Baxter's senior management felt that the strategic importance of merging with AHSC far outweighed AHSC's environmental liabilities.

⁶¹ The first issue was devoted to understanding the impact of the Resource Conservation and Recovery Act (RCRA) on Baxter.

Soon after the merger, as a part of corporate restructuring, the environmental budget of the merged firm actually decreased in absolute terms. Consequently, Baxter's environmental program began suffering from inadequate human resources. This was further accentuated by attrition.

Unfortunately for Baxter, such budget squeezing and attrition coincided with the increasing number, stringency, and complexity of environmental regulations at the federal, state, and local levels. Environmental issues had begun to have a dramatic impact on the costs of doing business, especially on issues such as real-estate transactions, landfills, and transportation of hazardous chemicals. Local communities and environmental groups had also become very aggressive in monitoring environmental performance of firms. To add to Baxter's woes, unflattering media reports began appearing on toxic emissions from Baxter's facilities, even though such emissions were legally permissible.⁶² In his address to the company's annual environmental conference, Vernon Loucks, Baxter's Chief Executive Officer (CEO) admitted that:

But for the most part, since the mid-1980s, Baxter's environmental program has slipped. There are several reasons for that. First, there has been an explosion of environmental regulations Second, our company has gone through some major changes. Early in the 1980s, the pressure to control health-care costs began to build Our merger with the American Hospital Supply Corporation in 1985 and subsequent restructuring were necessary responses to these developments But in addressing these vital issues, the company lost sight of the importance of a good environmental program. We began to take our eye off the proactive measures needed to sustain compliance. Scores of new people were taking on environmental duties at

⁶² I have discussed this in the case study on the 33/50 program in Chapter 5.

our facilities, but we were not giving them the training and time they needed to do their jobs (Baxter 1990:1-2).

Prompted by negative media coverage and litigations by the Environmental Protection Agency, Baxter refocused on environmental programs in the late 1980s. Four key individuals -- Senior Vice-President, G. Marshall Abbey; Vice-President, Charles F. Kohlmeyer; Head of Environmental Law, Ray Murphy; and Senior Counsel, and subsequently, Ray Murphy's successor, William R. Blackburn -- saw within such external pressures the opportunity to push through a pro-environment agenda within Baxter. They found a sympathetic ear in Vernon Loucks. These managers argued that Baxter must proactively deal with environmental issues by having a state-of-the-art environmental program. Abbey and Kohlmeyer marketed this vision to the top management, and Murphy and Blackburn, to the rest of the organization.

In the late 1980s, taking initial steps towards realizing this vision, Baxter adopted three sets of beyond-compliance policies. First, in 1988, the ERB decided to remove all underground storage tanks from its facilities all over the world and replace them with expensive tanks having beyond-compliance features.⁶³ Second, in 1989, the ERB decided that Baxter should aggressively reduce its emissions of air toxins and chlorofluorocarbons (CFCs). With 1988 as the baseline, the ERB set a target of reducing these emissions by 60 percent by 1992, and by 80 percent by 1996.⁶⁴ Third, the ERB decided to assess the environmental liabilities of AHSC facilities; Arthur D. Little (ADL), a leading environmental

⁶³ I have discussed this policy in detail in Chapter 4.

⁶⁴ I have elaborated upon this policy in Chapter 5 in my discussion on the 33/50 program.

consulting firm, was hired to develop a screening protocol.⁶⁵ Based on this protocol, ADL audited twenty six facilities and reported that environmental programs were indeed in a state of neglect (Baxter, 1990).

In December 1989, Ray Murphy retired as the head of Corporate Environmental Law. As discussed earlier, Murphy contributed significantly towards institutionalizing the environmental function within Baxter. William Blackburn succeeded Ray Murphy as the head of Environmental Law Affairs.⁶⁶ Soon after assuming his new responsibilities, Blackburn, along with Ron Meissen of Corporate Environmental Engineering (and their respective teams) began preparing a blueprint to revitalize Baxter's environmental programs.⁶⁷ On February 16, 1990, Blackburn presented this plan to the ERB where it was unanimously approved.

Under this plan, Baxter would establish a state-of-the-art environmental program; ADL was invited to help in this task. Note that the ADL had been hired in 1988 to develop a screening protocol. As I discuss in Chapter 8 (Environmental Audits), the adoption of state-of-the-art standards on an accelerated schedule, and the invitation to ADL, was resisted by some facility- and division-level managers. However, a forceful advocacy of the new policy by senior management, especially Loucks and Abbey, left little room for such opposition to continue. As Loucks noted:

⁶⁵ This policy is discussed in Chapter 8 in the case on Environmental Audits.

⁶⁶ In 1992, William Blackburn was named as Vice-President of the newly created division of Corporate Environmental Affairs.

⁶⁷ I understand from at least two sources that Bill Blackburn was spotted working on this document even on Christmas Eve !

Unfortunately, business hasn't done a good job of acting on environmental issues in the past. At least that's what the public thinks. A recent survey by the Roper Organization found that only one-third of those polled felt that business was meeting its obligations to protect the environment. Companies that try to meet this obligation with words alone will not be taken seriously.

It's tempting to ask: Can't we just lie low, wait for the storm to pass, then go about business as usual? No, this won't blow over, and this is no time for our industry to display a bunker mentality. While survey results may shift from time to time, the public's high interest in the environment will remain (August, 1992c: 1-2).

Baxter adopted a two-stage strategy. First, with help from ADL, Blackburn's team defined "state-of-the-art" standards for firms in similar environmental risk categories as Baxter. In 1989, Blackburn had already identified management systems adopted by Baxter's facilities with strong environmental programs. The first cut of the state-of-the-art standards was based on this data. Once the state-of-the-art standards were defined, ADL audited Baxter's corporate and divisional programs against these standards.⁶⁸ ADL reported that by the end of 1990, Baxter's program at the corporate level had progressed to two-thirds of the way towards meeting state-of-the-art requirements; programs at the divisional levels met about 40 percent of the state-of-the-art requirements with some divisions as low as 7 percent and others at 80 percent level. Assessments done by Corporate Environmental Group suggested that environmental programs at the facility level were about 35 to 45 percent of the state-of-the-art requirements (Baxter, 1991a).

Following the ADL report and the new policy, Vernon Loucks mandated that all

⁶⁸ Since such standards are dynamic, ADL is invited every three years to redefine these standards and recertify Baxter's environmental programs.

facilities based in the U.S., Canada, and Puerto Rico should achieve the state-of-the-art standards by 1993, and facilities abroad by 1996. Consequently, the ERB asked Blackburn and his team to prepare a plan for revamping environmental programs. Further, to monitor progress on various environmental initiatives, they also asked Blackburn to prepare a yearly State-of-the-Program Report for presentation to the ERB.

Following ERB's directive, many organizational and institutional changes were implemented. First, a new environmental manual was issued. This manual outlined the responsibilities, procedures, forms, and audit checklists to help environmental managers, whether at facilities, divisions, or at the corporate-office, in performing their functions. Second, to give higher visibility and coherence to environmental function, the Environmental Law section was spun off from the Law Department and established as a separate function: Corporate Environmental Affairs.⁶⁹ Third, the major responsibilities to design and implement environmental programs was moved from Corporate Groups to divisional environmental managers (DEMs). As a result, new DEMs were recruited; their number increased from 6 in the beginning of 1990 to 14 by the end of 1990 (Baxter, 1991a).

Packaging reduction initiatives are the next landmark in the evolution of Baxter's environmental program. This was prompted by a challenge put forth by the Coalition of Northeastern Governors (CONEG) to the top two hundred users and producers of packaging in the U.S. In May 1991, on behalf of CONEG, New Jersey Governor Jim Florio, in a letter

⁶⁹ Further, to facilitate closer interaction between Corporate Environmental Engineering (CEE) and Corporate Environmental Affairs (CEA), their offices were relocated in close physical proximity. Note that, though CEA is a separate function, its Vice-President reports to the General Counsel, who also chairs the ERB.

to Vernon Loucks, asked Baxter to voluntarily set goals to reduce its packaging wastes and periodically report its progress to CONEG's Source Reduction Council. Accepting the CONEG challenge, Baxter committed to a 15 percent reduction in per-unit packaging weight by 1996 with 1990 as the baseline (Baxter, 1991b).⁷⁰ The ERB asked Corporate Engineering to work with divisions for establishing numerical goals for facilities and divisions. On this count, Baxter went beyond the CONEG challenge in that CONEG's packaging reduction guidelines did not contain any deadlines or reduction targets (Baxter, 1992b). Baxter's Packaging Reduction Task Force set both target dates and numerical objectives on the following:

- * Eliminate foams made of CFCs;
- * Eliminate/reduce use of inks containing heavy metals such as lead, mercury, and cadmium;
- * Modify Corporate Identity Guidelines for the company logo to allow for the use of recycled paper on office stationary and packaging materials;
- * Apply Society of Plastics Industry and American Paper Institute recycling symbols for appropriate packaging;
- * Require increased use of recycled and recyclable products
- * Promote sale of single package, multi-product medical kits and reusable shipping containers;
- * Minimize using chlorine-bleached papers and paperboard in packaging.
- * Develop programs to encourage its suppliers to adopt similar packaging reduction packages.

Apart from the specific initiatives, Baxter has also established awards for recognizing individual as well as team performance. Three categories of annual awards have been instituted. First, there are awards for environmental managers in facilities and divisions.

⁷⁰ Approximately 30 companies accepted this challenge.

Facility-level awards are of two kinds: award for the best all-around program and for the best pollution-prevention initiative. Analogously, there are two division-level awards: all-around best program and pollution prevention. Second, the Erwin Awards, instituted in the memory of Dr. Lewis Erwin,⁷¹ is given to teams that have demonstrated excellence in packaging initiatives. Third, the Merit Awards, are presented to non-environmental managers that have significantly contributed to environmental efforts at the facility, division, company, or community levels.

Baxter has also pioneered corporate environmental accounting by calculating the business impact of its environmental initiatives. This is an important step for retaining support of internal constituents that may perceive environmental programs as reducing profits. As shown in Appendix 3.2, the 1995 Environmental Financial Statement suggests that in 1995 the total costs of environmental programs was \$25.2 million while savings in 1995 alone were \$15.2 million. However, recurring yearly savings due to past environmental initiatives were \$72.2 million. As a result, total savings to date due to environmental initiatives are \$87.4 million. Thus, this green accounting seeks to demonstrate the financial viability of environmental projects.⁷²

Is Baxter's commitment to a state-of-the-art program financially viable and hence sustainable in the long run? I think Baxter has very efficiently managed its environmental

⁷¹ Dr. Erwin chaired Baxter's Task Force on environmentally-sound packaging.

⁷² Baxter's efforts in estimating the financial impact of its environmental initiatives have been recognized by Stephan Schmidheiny, the Chairperson of the World Business Council for Sustainable Development, in his recent co-authored book *Financing Change* (Schmidheiny and Zorraquin, 1996). Schmidheiny was a major player in the 1992 Rio Summit.

initiatives. Consider Baxter's expenditure on environmental programs as a percentage of sales. Baxter has succeeded in this as well, as it devoted only 0.3 percent of its 1995 sales to environmental programs. This was considerably less than the 2 percent figure reported by 1991 survey of 220 companies done by of Booz, Allen and Hamilton and the 1995 study of Cooper and Lybrand that focussed on firms with sales greater than \$5 billion (Baxter, 1995a).

Organizational Structure

Since 1993, Baxter has steadily consolidated its environmental programs. Its organizational structure in 1992-1996 is summarized below:⁷³

- Level I: Board of Directors; Public Policy Committee of the Board
- Level II: Environmental Review Board (ERB); European Environmental Board
- Level III: Corporate Environmental Affairs (CEA); Corporate Environmental Engineering (CEE)⁷⁴
- Level IV: Division Environmental Managers (DEM)
- Level V: Facility Environmental Managers (FEM)

The Public Policy Committee of the Board of Directors is the highest decision-making body on environmental issues. This committee has two functions. First, it annually reviews Baxter's environmental performance. Second, it reviews the environmental plans of

⁷³ My period of study ends in March 1996.

⁷⁴ In the new Baxter International Inc., CEE has been merged with CEA. Further, the Health and Safety Function has also been merged with the environmental function. As a result, William Blackburn in now Vice-President of Environmental, Health, and Safety (EHS). As I discuss subsequently, in Lilly, EHS constitutes a single corporate group.

Baxter's operating units. Since its members are not employed by Baxter, this committee also provides an external oversight over the environmental programs.

The ERB is the highest internal organization on environmental issues. The ERB oversees all environmental initiatives, company-wide as well those pertaining to divisions only. In early 1996, the ERB had eleven members: nine representing senior managers from different functional areas and two DEMs. To ensure transparency in its decision-making, all Baxter's environmental personnel are invited to attend ERB's meetings that are held once every two months; and some of them actually do so.

ERB is expected to champion environmental programs and provide top-management support to them. As Loucks noted in his address to the conference on "Our Environment: A Healthcare Commitment," held in Arlington, Virginia, on March 10, 1992:

My final and most important recommendation is to provide strong top-management support for your environmental program. Do this visibly, repeatedly, and sincerely. Serve as the main salesperson for the program to middle management Underscore the need for your managers to allocate appropriate resources. Recognize excellence in environmental performance Without this support, without this leadership, your environmental programs cannot succeed. To say it starts at the top is really a cliché. It starts there or it doesn't start at all (Baxter, 1992a: 10-11; italics mine).

Formed in 1992, the European Environmental Board oversees the implementation of environmental policy in Baxter's European Operations. Its status as independent of the ERB suggests that Baxter perceives environmental challenges in Europe as being significantly different from those in the US and other parts of the world. The head of Baxter's European operations is the *ex officio* chairperson of this committee. The head of Baxter's Corporate

Environmental Affairs is also an *ex-officio* member of this committee. In addition, as of March 1996, this committee had nine senior managers representing various European operations.

Corporate Environmental Affairs (CEA) coordinates environmental activities throughout the company. It also acts as a resource for divisions and facilities. It prepares the annual environmental performance report, organizes environmental audits, and manages legal issues relating to real estate transactions and superfund liabilities. In addition, it manages strategic initiatives such as estimating net savings from various environmental initiatives and evaluation of the ISO 14000 program (Chapter 7). Corporate Engineering works closely with CEA on programs having engineering implications. It has managed key programs such as Underground Tank removal (Chapter 4) and toxic emission reduction (Chapter 5).

DEMs are the main actors in initiating and implementing Baxter's environmental programs. Since they manage divisions' environmental budgets, they have significant influence in planning division-level initiatives. They also prepare their division's annual environmental performance report. This report is key to preparing Baxter's annual environmental performance report. DEM's support is often important for undertaking any company-wide environmental initiatives. DEMs are also responsible for training FEMs that report to them. FEMs are responsible for managing all facility-level environmental programs, whether required by law or beyond compliance. For example, they are expected to initiate and manage community-outreach programs. They are also required to train non-environmental managers on environmental issues.

In 1995, Baxter had 173 managers performing environmental functions. Since some of these managers had non-environmental responsibilities as well, there were 126 Full Time Equivalents (FTE) environmental managers. Of these, 96 were at the facilities, 20 were at the divisions, and 10 were at the corporate level. This suggests that Baxter's environmental programs are significantly decentralized, as only 10 of the 126 FTEs are at the corporate level (Baxter, 1995a).

Importantly, there has been a conscious effort to upgrade the quality of FEMs; two strategies have been employed for this task. First, since training is often identified as a key factor in imparting skills, Baxter has established training norms: FEMs of large manufacturing facilities are expected to receive a minimum of 80 hours of training per year and FEMs of smaller facilities are supposed to receive 60 hours of training per year. This target was met in 1995 since, on average, FEMs received 73 hours of environmental training. The second strategy is to retain FEMs, and thereby lowering FEM turnover. Since environmental laws are complex, it takes time for a new FEM to get accustomed to his or her role. As a result, FEMs are in a position to initiate and manage beyond-compliance programs only after the adjustment period. The DEMs and corporate groups have made significant efforts to attract and retain managers committed to the environmental function. This has often involved significant personal commitment to train and support new FEMs.

Eli Lilly: An Overview

Founded in 1876, Eli Lilly and Company is an Indianapolis-based multinational corporation that develops, manufactures, and markets pharmaceutical products. As shown

in Table 3.2 below, its 1995 net sales stood at \$6.7 billion, and its research and development (R&D) expenditure at \$1 billion.

[Insert Table 3.2 About Here]

Lilly focuses on five disease categories: central nervous system, endocrine, infectious, cancer, and cardiovascular. Such focus is important since researching and developing new drugs has become extremely expensive. For reference, in 1995, the average cost to discover and develop a new drug was about \$350 million and the average length of time to commercialize a drug was in the range of 10-12 years (Lilly, 1995b). Such cost pressures have also led to a spate of mergers and acquisitions in the pharmaceutical industry across continents, as no single national market can defray the expensive R&D costs. Instead of merging with other drug firms to become a major player in a wide-range of pharmaceuticals, Eli Lilly has chosen to focus its R&D efforts on five disease categories. These categories represent its core-competencies (Prahalad and Hamel, 1990) in which it has the critical R&D capabilities. A recent study commissioned by Lilly also suggested that size of firm *per se* is unimportant, once the firm has critical R&D capabilities in a given disease category (Lilly, 1994a).

Let me elaborate with an example. Lilly has chosen to focus on diabetes, a disease in the endocrine category. Historically, it has been a leader in diabetes treatment, having developed and marketed the first insulin product in 1923. Many diabetics find that this disease disrupts their normal daily schedules: they are required to check their blood glucose

several times a day with cumbersome instruments; they have to take insulin at least 30 minutes before a meal. Lilly has responded to these unmet consumer needs by developing: (a) a user-friendly electronic device for administering accurate insulin dosages; and (b) an insulin analog -- Humalog -- that can be taken just before a meal. Thus, instead of providing partial treatments in a wide range of disease categories, Lilly has chosen to provide a wide range of treatments in a few disease categories. As a result, if Lilly has a presence in a disease category then it is one of a market leader. Such a culture of doing few things, but doing them well, is also reflected in its environmental programs.

Evolution of Environmental Programs

The story of the evolution of Lilly's environmental programs is less dramatic than that of Baxter's. Lilly's environmental programs have progressed slowly but steadily with only occasional lapses. Initially, environmental programs were driven by Lilly's business needs, specifically treating waste-water streams from its bulk manufacturing facilities. Lilly has three types of facilities:

- (a) Bulk manufacturing facilities, where it manufactures antibiotics in bulk using three types of processes: chemical synthesis, antibiotic fermentation, and bio-synthesis. Chemical synthesis is intensive in solvent use. Bio-synthesis involves using micro-organisms with recombinant DNA. It does not require using solvents or waste-water in significant quantities.

Antibiotic fermentation is intensive in waste-water use since it involves using living micro-organisms as inputs. Colonies of such micro-organisms are developed in large tanks that ferment solutions of corn and soybean meal, lard oil, and plant starches. The manufacturing process is extremely water-intensive. Once the manufacturing is over, the fermented material and waste-water need to be disposed. If it is not done in an environmentally-sound manner, this can pollute water streams and harm human and aquatic life.

- (2) Fill and finish facilities, where the bulk antibiotics are put into capsules or other final product forms.
- (3) Research and Development sites and Technology Centers.

Most of Lilly's early environmental initiatives took place in its bulk manufacturing sites at Tippecanoe and Clinton, both in Indiana. Manufacturing processes in these facilities involve both chemical synthesis and antibiotic fermentation.

Lilly has been a pioneer in developing and adopting waste-water treatment technology. As discussed in the case study on Underground Tanks (Chapter 4), as early as 1952, Lilly hired Robert Lowe to install a state-of-the-art waste-water treatment plant in its Tippecanoe facility. In the 1960s, Lilly began supporting a study conducted by Professor James Gammon of DePauw University on aquatic life in Wabash River. Since the Clinton and Tippecanoe facilities are located on the banks of Wabash river, Lilly was interested in documenting the impact of effluent discharges from these facilities on the Biological Oxygen Demand (BOD). Specifically, it wanted to investigate whether the investments in waste-water treatment plants have lowered the BOD levels in the Wabash river. BOD is a critical indicator of hospitability of any waterbody for aquatic life: the lower the BOD levels, the higher is the oxygen available to support aquatic life. Gammon's study suggests that since 1975 the BOD levels in the Wabash river have steadily fallen and the Wabash river has become more hospitable for aquatic life.

The late 1970s marked the beginning of Lilly's crop nutrient program. As suggested earlier, the bulk facilities generate fermented wastes in significant quantities. For reference,

between 1987 and 1993, they generated between 31-42 millions gallons of such waste annually (Lilly, 1995a). Since this fermented waste is rich in nitrogen, it can be used as a plant nutrient. This is also an environmentally-safe way of disposing this industrial waste.⁷⁵ By providing this fermented waste free of charge to farmers in the vicinity of Tippecanoe and Clinton facilities, and suggesting ways for their scientific application, Lilly disposed off the waste in an environmentally-safe manner and also earned the goodwill of the farmers.

Programs such as establishing waste-water treatment facilities, supporting the Wabash river study, and organizing the crop nutrient programs were handled predominantly at the facility level with little direction from the corporate office. The need to strengthen corporate environmental resources began to be felt towards middle of 1970s. This was primarily due to the complex nature of new laws and regulations, especially the Resource Conservation and Recovery Act (RCRA) of 1976, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. In 1975, to strengthen the environmental function, Bert Gorman was appointed head of Corporate Environmental Affairs. Over the next few years, Lilly increased the managerial strength of its environmental organization, both at the corporate and facility levels: from three full time equivalent (FTE) managers in 1975, to about twenty-five FTE by mid 1980s. This increase was due to both new hiring from the outside of the company and transfers from other divisions within Lilly.

1989 constitutes a landmark in the evolution of Lilly's environmental programs for many reasons. First, in this year, the Corporate Environmental Legal department conducted

⁷⁵ However, excessive application can result in leaching of soil and the formation of nitrates in the water table.

Lilly's first internal audit. This audit focused on Tippecanoe facility's compliance with RCRA. Since it revealed certain shortcomings, the senior management approved inducting more managers in the environmental organizations, both at the corporate- and facility-levels.

Second, in 1989, the Environmental Management Committee (EMC; see below) approved an investment of about \$80 million to install Regenerative Thermal Oxidizers for reducing emission of methylene chloride from its Tippecanoe and Clinton facilities (details in Chapter 5).

Third, in this year the Food and Drug Agency (FDA) inspected the Indianapolis facility and identified problems in quality control systems. In response, Lilly restructured its Quality Control/Quality Assurance (QC/QA) organization, with Robert Williams as its new head. Williams was a senior manager holding the rank of Vice-President.⁷⁶ Importantly, environmental affairs was added to Williams's portfolio signaling to the whole organization the increased importance of environmental issues. Don Brannon, from Research and Development, was moved in as the new Director of Corporate Environmental Affairs with Brannon reporting to Williams.

Fourth, in 1989, Lilly formally adopted Chemical Manufactures Association's (CMA) Responsible Care Program. Under this program, firms were expected to implement six Codes of Conduct, including community outreach programs. As discussed in Chapter 6, since there was internal opposition to implementing community outreach programs, Lilly initially

⁷⁶ Quality Control is a line function located at plant sites. Its main objectives are to ensure that: (a) drugs are formulated correctly, and (b) plant personnel are observing Good Manufacturing Practices. In contrast, Quality Assurance is a corporate function focusing on issues such as whether management systems are in place and whether employees are getting requisite training.

implemented only five of the six Codes; community outreach programs began only in 1993.

Fifth, the underground storage tank removal program was also initiated in 1989. As discussed in Chapter 4, under this plan, Lilly removed all underground tanks, and replaced them with above-ground tanks that had significant beyond-compliance features. The total cost of this program was about \$100 million with the beyond-compliance expenditures amounting to \$30-40 million.

Though firms often adopt environmental programs in response to new laws and regulations, they may also play important roles in influencing the evolution of such laws and regulations. On this count, 1990 was an eventful year in that it marked the onset of a visible role for Lilly in influencing proposed laws and regulations. Lilly's legal department identified problems in implementing the 1990 Clear Air Act Amendments. As a result, Lilly sued the Environmental Protection Agency. Though the two parties eventually reached an out-of-court settlement, this well-researched intervention significantly increased Lilly's credibility in the environmental-legal community as a serious player in air and water regulatory issues. In 1993, Indiana's Governor Bayh asked Lilly to nominate one of its managers to serve on the state task force for identifying appropriate mechanisms to fund Indiana's water and hazardous waste programs. In that year, Lilly's legal department also worked closely with the Indiana Department of Environmental Management on Title V Air Program Rules (Lilly, 1993).⁷⁷

Organizational structures such as the CEA are by themselves insufficient to change

⁷⁷ In 1992, Lilly's managers attended 205 off-site meetings, offered written comments on 56 proposed legislations/regulations, and gave testimony in 6 hearings. The comments and testimonies were given on a wide range of issues such as Voluntary Remediation, Agency Funding, Pollution Prevention, RCRA, SARA, and Asbestos Regulations (Lilly, 1992b).

behaviors of actors within a firm. Often, clear sets of rules -- institutions -- are required that lay out responsibilities and sanctions for non-performance. Thus, in 1991, to provide a clear communication to internal and external stakeholders on the objectives of Lilly's environmental programs, Eli Lilly issued its *Environmental Policy and Guidelines* (see, Appendix 3.3).⁷⁸ In these guidelines, Lilly reaffirmed its commitment to follow or exceed all applicable environmental rules and regulations. Since this document constitutes a public statement of Lilly's intent, it may also be viewed as a set of standards for evaluating Lilly's environmental programs.

Environmental Policy and Guidelines lays out the macro objectives of Lilly's environmental programs. It is not a tool to monitor progress on the various individual programs. In the highest positivist tradition, Robert Williams believed that Lilly should be able to measure its compliance with *Environmental Policy and Guidelines*. He argued that though environmental audits were useful tools for this task, an annual report on the overall progress of environmental programs was required. Consequently, in 1992, Donald Brannon and Richard Lattimer, both of CEA, put together and presented Lilly's first *Environmental Annual Report*. Its introduction stated:

The purpose of this report is twofold. The first is to highlight the achievements of the environmental program at Eli Lilly and Company. The second is to be forthright regarding the environmental challenges facing Lilly as an inspiration to employees to take the initiative to improve the environmental performance of the corporation (1992b: 3).

⁷⁸ Daniel Carmichael, Lilly's Deputy General Counsel and Company Secretary, played a key role in drafting these guidelines.

In its earliest version, the *Environmental Performance Report* was a *de facto* consolidated audit report. However, over time, these reports have become more comprehensive and they now serve as a tool for communicating Lilly's progress on its environmental programs, whether or not it is reflected in environmental audits.⁷⁹

In 1991, two initiatives were implemented to create an environmental ethic within the company. First, a Waste Minimization Conference was organized involving engineers and scientists from the various divisions of Lilly. Participants presented project ideas to minimize waste generation. This conference has now become an annual feature. Further, in 1992, the first Global Environmental Managers conference was organized that involved participation of environmental managers from Lilly's subsidiaries all over the world. Don Brannon played a key role in organizing this conference.

Second, in 1991, an interesting program to "green" non-industrial aspects of Eli Lilly was initiated. The objective was to recycle material used in office environments. Four kinds of materials were identified: white paper, beverage cans, laser printer toners cartridges, and telephone books. Goals were also established for each category. For example, compared to the target of recycling 1.5 million beverage cans, about 1.3 million cans were recycled; compared to a target of recycling 3100 tons of white paper, about 3700 tons was recycled. Funds generated from this recycling program are donated to local charities (Lilly, 1992b). These kinds of initiatives are important because they instill a kind of environmental ethic among employees who generally do not consider themselves a part of Lilly's environmental

⁷⁹ Unlike Baxter's, Lilly's environmental department does not publish a newsletter for internal circulation.

programs. In addition, such programs also enhance in-company visibility of environmental managers.

During 1990-1993, the number of FTE environmental managers (predominantly environmental lawyers and engineers), both at the facilities and in the corporate groups, increased from 218 to 340 (Lilly, 1992b). This was due to two major factors. First, this was almost forced by the ever increasing number and complexity of environmental laws and regulations at the federal, state, and local levels. Second, there was a significant expansion in Lilly's bulk manufacturing capacity. Since there are many regulatory issues involved in bulk manufacturing, this required significant increases in managerial strength of the environmental function.

1993 marks the peaking of the growth phase of the CEA. First, Robert Williams retired. As suggested before, Williams was a key actor in establishing Lilly's environmental organization and institutions. Since, his successors have been of the rank of a Director,⁸⁰ some managers interpret this as an indicator of a diminished clout within Lilly of its environmental organization. Further, by 1996, as a result of gradual attrition, the FTE headcount of CEA came down to twenty-one from thirty-five in 1991. Such staff reductions reconfirm suspicion about the declining fortunes of the environmental function.⁸¹

However, the picture is not as bleak as it seems. In 1995, primarily due to the initiative of John Wilkins of CEA, Lilly published its first Environmental Health and Safety

⁸⁰ The hierarchy is: Chief Executive Officer, Executive Vice-President, Vice-President, General Manager, Executive Director, and Director.

⁸¹ In addition, it also represented the trend towards decentralization: empowering facilities by locating most of the environmental managers at plant sites.

Report that shared information with external publics on Lilly's environmental programs. Since then this report has become an annual event.

In 1996, Lilly's Tippecanoe facility volunteered to become a pilot site for the Management System Verification (MSV) program of the Chemical Manufacturers Association (CMA). As discussed in Chapter 6, Responsible Care has been criticized for its lack of external verifiability; firms self-certify that their facilities are implementing the various Codes of Responsible Care. In response to this criticism, the CMA is conducting MSV on a pilot-basis, and Lilly's Tippecanoe facility is one of such pilots. Under MSV, managers belonging to CMA member firms will audit the facility's progress on Responsible Care. Importantly, this is the first time that Lilly's environmental programs will be audited by external actors. As discussed in the case study on Environmental Audits (Chapter 8) unlike Baxter, Lilly does not invite external actors for environmental audits. Hence, the first external audit, even though on a trial-basis, signifies an increased confidence within Lilly about the strength of its environmental programs.

Organizational Structure

Though Lilly's environmental function is integrated with its Health and Safety functions, I will describe only the environmental organization. This organizational structure has the following components:

- Level I: Public Policy Committee of the Board of Directors.
- Level II: Operations Committee
- Level II: Environmental Management Committee.
- Level III: Corporate Groups: Environmental Affairs, Legal, and Engineering;

Environmental Coordinators at sites.

The Public Policy Committee of the Board of Directors is the highest policymaking body on environmental issues.⁸² Since its members are not Lilly's employees, they provide external oversight over Lilly's environmental programs.

The Operations Committee is the highest internal body on environmental issues. All its members are Lilly employees. It reports to the Board of Directors. Currently, it is headed by Sidney Taurel, Lilly's Chief Operating Officer. The main function of this committee is to align Lilly's Environmental Health and Safety (EHS) strategy with other strategic objectives of the company.

The Environmental Management Committee (EMC) is the highest internal body that focuses *exclusively* on EHS issues. It reports to the Operations Committee. Currently, the EMC is chaired by Mike Eagle, Vice-President of Manufacturing. Since Eagle is also a member of Lilly's Operations Committee, he represents the environmental function in the top management. Its members consist of senior managers representing various functions. The EMC monitors progress on the various environmental programs and approves the environmental budgets that have been proposed by the divisions.

Corporate Environmental Affairs (CEA) is a corporate group that coordinates activities required to carry out Lilly's *Environmental Policy and Guidelines*. It reports to

⁸² Lilly's Board of Directors has five committees: Audit, Compensation and Management Development, Public Policy, Finance, and Directors and Corporate Governance.

Edward Smithwick, Vice-President of Bulk Manufacturing.⁸³ Since most of CEA's managers have had prior experience at facilities, they blend technical and operational level experience with an expertise in regulatory issues.⁸⁴ As a result, CEA serves as a credible resource that delivers managerial tools to managers at plant sites. CEA manages the agenda of the EMC and prepares Lilly's *Annual Environmental Report*. Its managers represent Lilly in the CMA. Importantly, CEA's managers monitor proceedings of the Indiana General Assembly that pertain to environmental issues, and lobby on behalf of Lilly.⁸⁵ It also advises Lilly's lobbyists in Washington, D.C. on environmental issues and, with the help of Corporate Environmental Legal department, prepares written comments on the proposed environmental laws. CEA also manages strategic initiatives such as the development and implementation of the Plant Site Environmental Compliance Listing System,⁸⁶ environmental risk assessment, and environmental impact analyses.

Another key corporate group -- Corporate Environmental Legal (CEL) -- is a part of Lilly's legal division. CEL represents Lilly in all legal matters such as superfund issues and real-estate transactions. It is the final authority in interpreting environmental regulations even though CEA may provide the initial advice. Along with CEA, CEL organizes and leads environmental audits of Lilly's sites, third-party contractors, and waste-treatment facilities.

⁸³ Edward Smithwick is a member of the EMC. He reports to Mike Eagle.

⁸⁴ They have both law-related (RCRA, CERCLA, SARA, etc.) as well as media-related (water, air, etc.) expertise. Some managers such as Donald Brannon, Advisor to CEA, have R&D experience.

⁸⁵ John Wilkins of CEA is a registered lobbyist in the Indiana General Assembly. A focus on Indiana is important as Lilly's major U.S. facilities are in this state.

⁸⁶ I have discussed this in Chapter 7.

Corporate Engineering provides technical input to CEA and CEL, as well as to plant sites. Lilly's sites have considerable autonomy in deciding their environmental programs. Environmental budgets are decided by the sites with corporate groups often having only advisory powers. This decentralization of environmental function manifests in two other ways: (1) plant-site environmental coordinators report to facility managers; they do not even have a dotted-line relationship with corporate groups; and (2) in 1995, of the 334 FTE environmental managers, only 33 belonged to Corporate Groups -- 22 in CEA, 8 in CEL, and 4 in CEE (Lilly, 1995c).

To streamline its Environmental Health and Safety (EHS) function, Lilly is implementing a Three-Loop Operations Design Model (Lilly, 1996). EHS activities include a wide-range of regulatory and performance-based programs requiring varying levels of expertise. To prevent duplicating functions across managers, an expertise-based division of labor is required that best matches the talents of environmental managers with the needs of the organization. The first-loop managers are expected to focus on activities designed to meet the operational requirements for implementing Lilly's *Environmental Policy and Guidelines*. As a result, most of such managers will be stationed at plant sites. The second-loop managers are expected to focus on tactical activities designed to improve existing management systems and technologies. The third-loop managers are expected to focus on strategic tasks. These managers are expected to possess detailed knowledge of regulatory and technological trends. Typically the second- and third-loop managers will belong to corporate groups.⁸⁷

⁸⁷ Second- and third-loop activities can also be contracted out.

Baxter and Lilly: A Comparison of Environmental Organization

It is instructive to compare Baxter's and Lilly's environmental organizations. Their environmental organizations have many similarities. First, in both firms, committees representing outside directors are the highest decision-making bodies on environmental issues: Public Affairs Committee for Baxter; Public Policy Committee for Lilly. Thus, these firms provide for an external oversight over their environmental programs. However, both these firms have a committee of senior managers (EMC for Lilly and ERB for Baxter) that is the *de facto* highest decision-making body on environmental policies. These committees have representation from various functional areas; this again suggests that both Baxter and Lilly acknowledge the cross-functional requirements of environmental programs.

Second, both firms also have a corporate group (the CEA) to coordinate various environmental programs. Further, in both, the corporate engineering group is distinct from other corporate groups, thereby highlighting the relative autonomy of technical personnel from the "policy types."

However, their environmental organizations also differ on three counts. First, in Baxter, the CEA is a distinct functional area headed by a Vice-President who reports to the General Counsel/ERB Chair. In contrast, in Lilly, Corporate Environmental Affairs is not a distinct functional area. It is headed by manager of Director rank who reports to the Vice-President of Bulk Manufacturing. This suggests that the environmental function has more clout in Baxter than in Lilly. Also, within Lilly there is a potential conflict of interest as CEA organizes and conducts (along with Legal) audits of manufacturing facilities. However, some of these facilities also report to the Vice-President of Bulk Manufacturing.

Second, in Baxter, Corporate Environmental Legal (CEL) is part of CEA. In Lilly, CEL is a part of Lilly's Law Department and not of Corporate Environmental Affairs. Since CEA managers also work on regulatory issues, there is a duplication in activities between CEA and CEL; this may constitute a source of conflict between these corporate groups.

Third, a key feature of Baxter's environmental organization is the important role played by the Divisional Environmental Managers (DEMs). Perhaps, this reflects the relative heterogeneous nature of Baxter's business operations with divisions representing distinct business portfolios. In contrast, since Lilly has a more focussed business portfolio, it has little need to divisionalize to the extent that Baxter has, and as a consequence, there is no intermediary layer of environmental managers between the corporate groups and the plant sites.

To conclude, in this chapter I have briefly described the evolution of environmental programs in Baxter and Lilly. In the next six chapters (Chapter 4-9), I examine ten cases of environmental policymaking. Four of these cases (Underground Tanks, 33/50, ISO 14000, and Environmental Audits) are common to both firms, and one each is idiosyncratic to them (Green Products to Baxter and Responsible Care to Lilly).

Table 3.1
Baxter International Inc.
Financial Highlights
(in millions of dollars)

	<i>1995</i>	<i>1994</i>	<i>Change</i>
Net sales	9,619	9,324	3.1%
Income from continuing operations	435	596	(27.0)%
Return on shareholder's equity	n.a.	17.3%	
Research and development expenditure	351	343	2.3%
Research and development expenditure as a percentage of net sales	3.6%	3.7%	

Sources:(1) <http://www.baxter.com/www/financia...port/1996/financialhighlights.html>; page 1 of 2; 04/27/97; 11:35:00

(2) <http://www.allegiance.net/COMPNEWS/Feb0397.HTM>; page 2 of 3; 04/27/97; 19:13:17

(3) Baxter International, *Annual Report 1994a*, page 1

Table 3.2
Eli Lilly and Company
Financial Highlights
(in millions of dollars)

	<i>1995</i>	<i>1994</i>	<i>Change</i>
Net Sales	6,764	5,711	18%
Income from continuing operations	1,307	1,185	10%
Return on shareholder's equity	42.5%	25.9%	
Research and development expenditure	1,042	839	24%
Research and development expenditure as a percentage of net sales	15.4%	14.7%	

Source: <http://www.lilly.com/financial/95-annual/html/hilites.html>; page 1 of 2; 03/02/97; 09:59:42

Chapter 4

Underground Storage Tanks (USTs)⁸⁸

Background

Industrial facilities often store liquids in forms of raw materials, work-in-progress, final outputs, and industrial wastes. Such liquids may be toxic, which alone or in combination with other substances, damage human health. Historically, USTs have been the cheapest way to store bulk liquids in production facilities. Since such stored liquids are often inflammable, it has been the job of fire marshals to inspect and regulate the use of USTs (Metelski and Anderson, 1989). However, neither the fire marshals nor some other public service providers had the mandate to check whether USTs have leaked with the consequent environmental impact. In the mid 1980s, the EPA estimated that about 70 to 80 percent of the “regulated”⁸⁹ USTs were constructed of bare steel; most of them were over ten years of age with approximately one-third being twenty years of age or more. Steel tanks often corrode non-uniformly and eventually leak through small holes known as “holidays” (USEPA, 1987). In 1988, the EPA estimated that as many as 25 percent of USTs were leaking (USEPA, 1988).

Leaking USTs can pollute soil and groundwater. Inflammable pollutants can also migrate through soil to nearby structures creating potential fire hazards. Individuals exposed

⁸⁸ Technically, these should be called SWUSTs: single-walled underground storage tanks. However, I employ the popular acronym: UST.

⁸⁹ These exclude USTs used by households for non-commercial purposes such as storing heating oil. Though such tanks are not covered by federal regulations, they may be covered by state regulations (Metelski and Anderson, 1989).

to contaminated water can develop serious health problems. Though not all leaking USTs may pose public health hazards, many USTs store chemicals (other than petroleum) containing carcinogenic substances. Even though petroleum is not carcinogenic, USTs storing petroleum may pose public health hazards since petroleum can contain carcinogenic fractions (Patrick et al., 1987). The potential for groundwater contamination depends on geohydrological characteristics of the area. USTs are reportedly the main cause of groundwater contamination in many states. This is alarming since about 50 percent of the U.S. population depends on groundwater sources to meet its drinking water needs (USEPA, 1988).

Soil and groundwater contamination may also result from surface spillage during filling operations or from piping leaks. The EPA believed that 40 percent of leaks occur in piping systems rather than USTs and the use of pressurized piping in gas stations accentuates piping leaks (Baxter, 1985a; USEPA, 1988). An EPA document observed that:

EPA studies show that most leaks result from piping failure. Piping is smaller and less sturdy than tanks. It is assembled in the field with numerous connections and usually installed near ground's surface. As a result piping suffers much more than tanks from the effects of installation mistakes, excessive surface load, the stress of underground movements, and corrosion (USEPA, 1988: 5).

If a UST leaks, clean-up costs can be substantial. They are estimated as being in the range of \$500,000-600,000 when both soil and groundwater have been contaminated and about \$50,000-60,000 when only soil has been contaminated (Baxter, 1995a). The issue gets complicated since, *ex ante*, it is difficult to establish whether a UST will leak at all and when

it will leak. On the other hand, as I discuss subsequently, replacing USTs with above-the-ground tanks or double-walled underground storage tanks (DWUSTs) is expensive (Baxter, 1995a). Some states also prohibit above-the-ground tanks for storing petrochemicals since they are a potential fire hazard.

The UST issue became topical in the 1980s leading to Congressional action. With the 1984 Hazardous and Solid Waste Amendments (HSWA) adding Subtitle 1 to the Resource Conservation and Recovery Act (RCRA) of 1976, the U.S. Congress mandated the EPA to create a comprehensive national level UST regulatory program. USTs were defined as those tanks that have 10 percent or more of their volume, including piping, underground (USEPA, 1988).⁹⁰ For USTs in operation and USTs out of operation in the last ten years, the HSWA required firms to notify the designated state agency. Further, it required the EPA to issue regulations for leak detection, corrective action, record keeping, and financial responsibility (Baxter 1985a).

At the time of the 1984 Congressional notification, the magnitude of the UST problem was inadequately understood. It was not known how many USTs existed in the U.S., in which states, how many of the operational USTs were leaking, how many of the abandoned USTs were leaking, which groundwater sources were contaminated by leaking USTs, and how many people were at risk due to polluted aquifers (NAPA, 1986). The EPA

⁹⁰ Some kinds of USTs were not covered by these regulations: (1) farm and residential tanks holding 1100 gallons or less of motor fuel; (2) tanks storing heating oil used on the premises where it is stored; (3) tanks on or above the floor of underground areas such as basements, tunnels, etc.; (4) septic tanks; (5) tanks for collecting waste or storm water; (6) flow-through process tanks; and (7) tanks holding less than 100 gallons (USEPA, 1988). Though Eli Lilly could classify most of its USTs as flow-through process tanks and not subject them to new standards, it chose not to do so. I elaborate on Lilly's beyond-compliance response subsequently.

also faced several problems such as the large number of actors to be regulated under the RCRA. Alan Altshuler, the Chairman of the National Academy Panel on Hazardous Waste observed that:

First, the regulated universe is very large. It consists of several million tanks, operated by more than one hundred thousand enterprises, most of them very small. Second, most of the regulated parties have little experience of regulation, cannot be counted on to notice governmental pronouncements (even if they arrive in the mail), and are financially strapped. Finally, EPA and its local counterparts themselves face severe resource constraints (NAPA, 1986: Foreword).

Subsequent research suggested that though there were millions of USTs in the U.S., about 1.4 million of them were covered by EPA regulations. As summarized in Table 4.1, about 96 percent of these stored petroleum and 4 percent stored chemicals. Of the ones storing petroleum, 49 percent stored it for sale and 47 percent for in-house consumption. Only 2 percent of USTs stored chemicals and were located in industrial facilities. Even though most of the leaking USTs were located at gas stations, the EPA focused its enforcement efforts on industrial facilities storing chemicals. This probably reflected the much discussed adversarial relationship between the EPA and corporate America.

[Insert Table 4.1 About Here]

There was a debate within EPA whether it should require replacement of all existing USTs of a certain age with DWUSTs or should it only apply such standards to new USTs

(Baxter, 1985b). On May 7, 1985, the EPA issued an interim ban on installing new single-walled USTs for regulated products (petroleum products, wastes, and hazardous substances).⁹¹ In November 1985, the EPA issued a notification requiring all tank owners and operators to notify state implementing agency of their USTs. Due to a large and diverse set of regulatees, the EPA opted for a decentralized mode of implementation by designating state environmental bodies as implementing agencies. This was yet another unfunded mandate where states were expected to fulfill new responsibilities without commensurate access to resources.

The second legislative milestone in the UST removal program was the enactment of the Superfund Amendments and Reauthorization Act (SARA) in 1986 establishing the Leaking Underground Trust Fund (LUST). This was to be funded by a gasoline tax for financing federal and state enforcement and cleanup activities. As a check against moral-hazard problems, individual states had to pay for a minimum of 10 percent of cost of the work done under the LUST program. Importantly, using LUST funds for cleanup did not release polluters from liabilities; all LUST funds are theoretically recoverable from them (Metelski and Anderson, 1989).⁹²

In addition to the LUST efforts, many states established UST upgrade and assurance

⁹¹ The UST regulations apply to hazardous chemical (except wastes) listed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 or "Superfund." Hazardous Wastes are regulated under Subtitle 3 of the RCRA.

⁹² Citizen activism to ensure safe drinking water was evident at the state level as well. For example, in 1986, the state of California enacted a law known as The Safe Drinking Water and Toxic Enforcement Act, or Proposition 65. Under this law, the Governor of California was asked to designate certain chemicals as being toxic. Firms which exposed people to these chemicals, were obliged to provide a proper warning in this regard or demonstrate that the exposure was below the significant risk levels (Baxter, 1988).

programs serving two objectives. First, to satisfy EPA's financial-responsibility requirements, states created guaranteed funds to ensure payments for clean-up and/or third party claims. Second, states established UST upgrade programs to help owners and operators, particularly small businesses, to replace or improve their USTs (Metelski and Anderson, 1989).

The 1985 EPA notification required upgrading, and not outright removal of existing USTs. Upgrading required installation of leak detection, corrosion protection, and spill/overflow prevention systems. Leak detection was important since most USTs being single-walled, leaks in them could contaminate soil and groundwater. Further, most USTs stored liquids for long time periods and volume losses due to leaks were not quickly noticed. This necessitated installing a leak detection system. Corrosion detection was required since most USTs were made of bare steel which was highly susceptible to corrosion leading to leaks. Overflow detection was required since most of the soil and groundwater contamination occurred during the filling of USTs.

As shown in Table 4.2, UST upgrading had a phase-in period depending on the age of the UST. Though leak detection systems were required to be installed for all existing USTs by December 1993, UST owners/operators could install corrosion protection and spill prevention systems by December 1998.

[Insert Table 4.2 About Here]

In summary, EPA's UST regulations were motivated by the following objectives:

- * To **prevent** leaks and spills;
- * To **find** leaks and spills;
- * To **correct** the problems created by leaks and spills;
- * To make sure that **owners and operators** of USTs **can pay** for correcting the problems created if their USTs leak; and
- * To make sure that each **State** has regulatory program for USTs that is as strict or stricter than Federal regulations (USEPA, 1988: 1; bold in original).

Baxter and Lilly: Response

Baxter and Lilly responded to the new EPA regulations by requiring their facilities within the U.S. (also Canada and Puerto Rico for Baxter; Lilly had no USTs in Puerto Rico) to remove all USTs within a given time frame. Baxter also outlined a schedule for removing USTs in its facilities outside North America. In the annual corporate environmental conference held on October 6-7, 1987, senior management outlined Baxter's program to remove all USTs (Baxter, 1988). Baxter's *State-of-the-Environment Report* reaffirmed that:

Baxter will voluntarily remove all existing single-walled underground tanks (USTs) for petroleum and hazardous substances in the United States, Puerto Rico and Canada by the end of 1992. We will achieve this mark worldwide by the end of 1994 (1995: 20).

A two-stage process for removing USTs was outlined. In the first stage, Baxter's Corporate Environmental Affairs hired Geraghty and Miller, an outside consulting firm, to assess the degree of soil and water contamination caused by existing USTs (Baxter, 1985b).⁹³

⁹³ Previously, American Hospital Supply Corporation (that merged with Baxter in 1985) had hired Geraghty and Miller to inventorize their USTs.

. When the UST removal plan was initiated in April 1987, Baxter had about 180 USTs in North America. As summarized in Table 4.3, a preliminary survey of 77 USTs revealed that 60 percent of these had contaminated subsoil or groundwater (Baxter, 1991a: 23).

[Insert Table 4.3 About Here]

To elicit corporate-wide commitment, Baxter's Corporate Environmental Affairs Department, along with the Engineering Department, sought to involve managers across facilities from the very beginning of the program. The *Travenol Environmental Newsletter*⁹⁴ noted that:

[R]ecently many of you received a questionnaire about the underground storage tanks (USTs) at your facility. This survey is the first step in the corporate UST program. The purpose of this program is to evaluate all of the USTs within the company The first phase of this program, the survey is providing information on the tank, the facility, the topography, and the groundwater. This information will be used to develop a prioritization scheme for all USTs within the company. Survey data, applicable regulations, and other information will be used to identify tanks that require a more thorough investigation. The final phase of the project will predict the environmental impact from any leaking USTs Because of high probability of USTs developing a leak, they pose potential liability. To minimize Travenol exposure, consider whether or not your facility really needs a UST or its current number of tanks (1986: 13).

In the second stage, Baxter's Environmental Review Board (ERB) earmarked a budget, outlined a time schedule, and set-up an internal organization headed by Ron Meissen

⁹⁴ Before its merger with American Hospital Supply Company in 1985, Baxter was known as Baxter Travenol Corporation.

of Corporate Facilities Engineering to remove USTs. Meissen had been with the company for more than fifteen years and enjoyed considerable credibility for his technical as well as inter-personal skills.⁹⁵ Corporate Environmental Affairs and Facilities Engineering were required to regularly report on the progress to the ERB. This signaled to the whole organization the high priority given by the top-management to this program.

High-priority programs may flounder if implemented hastily or there is insufficient and irregular sharing of information. Since policy-supporters (belonging primarily to Corporate Environmental Affairs and Engineering) were sensitive to this aspect, there was constant flow of information to facility managers on issues such as progress on program implementation, penalties for violating EPA's guidelines, etc. For example, the *Baxter Environmental Newsletter* reported that:

The first enforcement order to correct alleged violations of underground storage tank rules was issued for not cathodically protecting a bare steel tank as required. Even though no leaks or contamination was involved, United Parcel Service was assessed a \$9,000 fine and ordered to remove a 10,000 gallon gasoline tank from a truck terminal in Connecticut (Baxter, 1988: 20).

As summarized in Table 4.4, Baxter made steady progress removing all its USTs in North America by 1990 and in rest of world in 1995.

[Insert Table 4.4 About Here]

⁹⁵ Currently, Ron Meissen is Director, Engineering in the Environmental, Health and Safety department.

Lilly also adopted a comprehensive program for removing USTs from its U.S. facilities. In 1986, on the prodding of policy-supporters, Lilly's Environmental Management Committee (EMC) began focussing on removing USTs on a priority basis. The EMC met virtually every month in 1986 to develop a strategy on the new UST regulations. Since there was scant information within the company on the number of such tanks, William Wager of Environmental Engineering was asked to compile an inventory of USTs. Mr. Wager went about systematically identifying tanks in the U.S. and non-U.S. locations. He found that the USTs were of various ages and capacities. As shown in Table 4.5, Lilly had about 300 USTs worldwide in 1986, of which 275 were in the U.S.. Further, 97 percent of the U.S. USTs were in two production facilities in Indiana -- Clinton and Tippecanoe -- helping to focus resources of this program. As I discuss subsequently, this also created incentives for Clinton and Tippecanoe facility managers to lobby for removing USTs.

[Insert Table 4.5 About Here]

To implement the new UST regulations, Lilly's EMC constituted a task-force consisting of James Vangeloff, David Bowman, and James Lowes. This group was asked to design new storage tanks incorporating state-of-the-art technology, and prepare budgetary estimates for their installation. All these managers had been trained as engineers and had been working for Lilly for at least ten years. Hence they had the technical expertise and organizational knowledge for this task. Importantly, since they all had worked in Lilly's plant facilities, they had a first-hand experiences of manufacturing and maintenance operations.

As a result, they had credibility with the plant-site managers and received active help from managers such as Roger Lruswick of Tippecanoe facility.

Lilly's management asked this team to apply the principles of zero-based budgeting in determining whether a particular UST was required at all or whether it was in operation due to historical reasons. In the course of their work, this team found that about 10 percent of the USTs could be eliminated by combining streams, cutting back on back-up tanks, etc. (Vangeloff, 1992). This is not surprising as many engineering projects are routinely over-designed; that is, excessive resources are devoted for performing a task. This represents both organizational-slack (institutional over-design) as well as path-dependency in technological choices.⁹⁶ Organizational renewal often requires rationalizing technological and institutional bottlenecks as well as over-design issues.

As discussed earlier, the new EPA regulations did not apply to flow-through USTs. Such tanks store liquids temporarily since they are a part of closed-loop production process. Leaks in such tanks can be easily identified in the next stage of the production loop to which such tanks are dedicated. More than 50 percent of USTs at Lilly could be classified as flow-through process tanks and therefore were exempt from EPA regulations. Hence, there was a debate within Lilly whether all USTs should be removed or only the ones which do not fall in the flow-through category.

There were three other major debates in Lilly on how to respond to the new UST regulations: First, should the new tanks be placed above-the-ground or underground since

⁹⁶ The literatures on organizational-slack is well established. Important works include Cyert and March (1963) and Leibenstein (1966).

EPA regulations permitted double-walled underground tanks? Second, if placed above-the-ground, should they be horizontal or vertical? Third, should the above-the-ground tanks be placed in an enclosed area? Managers at Lilly were thus faced with the following decision: the costs of adopting the most spartan route (and yet remain in compliance) versus the most ambitious route were significantly different; instead of spending more than \$100 million on the most ambitious route, Lilly could spend as little as \$30-40 million.

Lilly chose to remove all USTs, including the ones which could be classified as flow-through process. The new tanks were above-the-ground tanks but below-the-grade. The former means that tanks are not buried and soil is not placed against their outer walls. Below-the-grade refers to the elevation of the tanks; that they are below the ground or grade level. As shown in Appendix 4.1, the new tanks were placed on platforms, which in turn were placed in a concrete bath tub-like structure. As Lilly's *Annual Environmental, Health, and Safety Report* noted:

[A]ll underground solvent storage tanks and pipes at our Clinton and Tippecanoe laboratories are being removed and placed above ground in concrete containment areas...groundwater and soil are protected by three-foot thick concrete floors and one-and-one-half-foot-thick walls (1995a: 23).

Two rows of new tanks were placed in a modular fashion. The key motivation for this design was that tanks could be visually inspected. Vangeloff notes that:

Although other good designs exist (including buried double-walled tanks, or tanks in a vault filled with stones), these systems rely heavily on instrumentation. It was felt that actually being able to see the skin of the tanks

would provide the best way of preventing an undetected spill (1992: 5/3).

The modular tanks were placed horizontally and not vertically. Though this required more space (hence more expenses), it reduced the risk of accidents and sabotage.⁹⁷ These tanks were placed in enclosures heated to 40 F. This had two major environmental advantages. First, it protected tanks from rain. Tanks often overflow and rainwater can wash away spilled toxic liquids and pollute water bodies. Enclosures would prevent rainwater from washing off spilled toxins. Second, often during winters (which are severe in Indiana, the location of 97 percent of the USTs), facility personnel are reluctant to go out in the open to carry out regular tanks inspection and maintenance. Placing storage tanks in enclosed heated areas reduced such weather-inspired shirking although it increased costs by about 5-10 percent. Overall, the newly installed modular USTs cost almost twice as much as other EPA acceptable versions.

Puzzle

In the mid 1980s, both Baxter and Lilly were confronted with the following issues: should they remove USTs, how many to remove, over what period of time, and with what kind of replacement storage tanks? Managers within these firms debated whether this policy should be limited to U.S.-based facilities only or extended all over the world. The variation

⁹⁷ During an interview, I was told that there was a TV serial during those times in which some people had a hobby of shooting at tall structures such as vertical storage tanks. Some Lilly managers were very concerned that vertical tanks may tempt some people to actually try out what was being shown on the TV. On this count, horizontal tanks appeared safer.

in expenditure was significant for Lilly ranging from \$30-40 million for the least ambitious (though still in compliance) route to more than \$100 million for the most ambitious beyond-compliance route. Lilly adopted the most ambitious route.

Baxter installed double-walled underground tanks which were 15-25 percent more expensive than EPA acceptable versions. Further, even though not required by law, Baxter installed new tanks in its facilities all over the world. By 1993, Baxter had spent over \$10 million on its UST program in North America alone (*Environmental Highlights*, 1993).

The puzzle is: why did these firms commit significant up-front capital expenditures without subjecting them to capital-budgeting? What were the intra-firm processes and inter-manager interactions on this Type 2 policy?

Predictions Based on Theories of Firms

As discussed in Chapter 2, efficiency-based theories predict that firms would subject projects requiring significant capital-expenditures to investment appraisal procedures such as capital-budgeting. However, if such projects cannot be subjected or, can be but are not, then efficiency-based theories are inadequate to explain policy adoption.

Power-based explanations predict that the Type 2 features of the UST programs would be adopted only if policy-supporters can “capture” the top-management, and have it overrule objections of policy-skeptics. Consequently, we should not expect organizational consensus on this policy. Leadership-based explanations suggest the Type 2 features of the UST program would be adopted if policy-supporters succeed in inducing policy-skeptics to change their preferences, and favorably assess the long term benefits of such Type 2 policies.

Analysis

The 1980s witnessed a flurry of new environmental legislation and an increasingly aggressive posture of regulators and citizen groups toward polluting companies. To use the popular expression, the “adversary economy” (Chandler, 1980; Marcus, 1984; Vogel, 1986) became even more adversarial. Media also portrayed leaking USTs as vivid symbols of corporate America's indifference to environmental concerns.

Markets also began to signal firms to incorporate environmental concerns in their policies. In particular, firms faced difficulties in getting insurance coverage for damages caused by normal business operations. Since the 1970s many general liability policies had been excluding coverage for pollution liability unless caused by unanticipated events. This, in part, was motivated by court cases where general liability was interpreted as covering gradual pollution and its impact on humans after long periods of time (NAPA, 1986). This created a market for insurance coverage against gradual pollution and many insurance firms stepped in to tap this market. In 1985, in anticipation of the imminent Superfund legislation, the market for gradual pollution liability for chemical (non-petroleum) exposures collapsed; insurance premia skyrocketed by almost 200 percent and 11 of the 14 major insurance suppliers withdrew from the market. If gradual pollution insurance was available, its liability was often limited to a maximum of only \$10 million.⁹⁸ Thus, buying insurance coverage for chemical USTs became problematic. Supporters of UST policies within Baxter and Lilly

⁹⁸ However, insurance market for petroleum exposures remained vibrant for two reasons: (a) petroleum releases were exempted from Superfund's liability provision; and (b) oil spills in gas stations often damage property and not humans (Clay, 1985).

used this as an example of significant but not easily quantifiable costs of ignoring environmental concerns.

Baxter and Lilly used USTs primarily to store chemicals. Baxter is the world's biggest supplier of intra-venous fluids whose production is water-intensive, requiring USTs in various stages of production. Lilly is a major manufacturer of antibiotics whose production, especially in the fermentation stage, was again organic solvent-intensive. Hence both firms required some sort of storage tanks for their normal business operations.

Adding beyond-compliance features to new storage tanks creates three types of benefits. First, for the public at large, they create benefits of cleaner water and non-contaminated soil. These benefits, having characteristics of public goods, are diffused across beneficiaries. Since firms cannot charge beneficiaries for benefits, such projects do not increase firms' profits. Consequently, profit-maximizing firms have little incentive to supply such public goods.

Second, beyond-compliance features create goodwill for firms with regulators, local communities, citizen groups, etc. Importantly, this goodwill is an excludable good accruing only to firms undertaking this policy and imparts benefits in many ways: firms get quicker approval for their environmental permits; regulators consult firms on new laws and regulations and incorporate their suggestions; and regulators leniently treat minor environmental violations. Since such benefits to firms cannot be quantified, managers assessing projects solely on the basis of quantifiable profits and costs are not interested in undertaking such projects.

Third, incorporating beyond-compliance features reduces future liabilities of firms

in the event any UST leaks. Lilly's managers argued for placing all new storage tanks in bath tub like concrete containers so that the tanks could be visually inspected for leaks.

In summary, the costs of incorporating Type 2 features are quantifiable, concentrated within firms, and immediate while benefits are either diffused or, if concentrated and excludable, they are non-quantifiable and occurring only in the long-run. Such policies would therefore not meet the criteria outlined in investment appraisal procedures, and as a result, efficiency-based theories would predict their non-adoption.

Since efficiency-based theories are not helpful in explaining adoption of the UST program, I turn to power-based and leadership-based explanations. Power-based explanations are also not helpful as the Type 2 features of the UST programs did not cause any significant conflicts between policy-supporters and policy-skeptics. The UST program was not adopted by imposition, as power-based explanations would predict.

Though in both the firms, some managers were initially hesitant in committing huge funds for USTs that had no quantifiable benefits, policy-supporters eventually won them over. In Lilly, I identify five such leaders: Neil Pettinga, Earl Herr, Crandle, Bert Gorman, and Daniel Carmichael. These managers had the expertise, networking capabilities, and personal credibility to influence corporate decision-making. Pettinga was the Executive Vice-President of Lilly with a background in Research and Development. Crandle, an engineer, was a Group Vice-President, in-charge of Lilly's manufacturing operations, and reported to Pettinga. Herr, the successor to Crandle, was an Executive Vice-President of Lilly. Gorman, a biochemist by training with Masters in Management, was the head of the Corporate Environmental Division; Carmichael is the Deputy General Counsel, Company Secretary,

and a member of the Environmental Management Committee. Since these individuals represented a variety of skills, their advocacy of the UST program was credible across functional areas.

In Baxter, I identify four leaders who championed the UST program: G. Marshall Abbey, C.F. Kohlmeyer, Ray Murphy, and William Blackburn, all having high credibility and persuasive skills. Abbey was a Senior Vice-President, the General Counsel, and the head of the Environmental Review Board. He was also a member of Baxter's Management Committee, the highest corporate decision-making body. Kohlmeyer was the Vice-President of facilities engineering, the agency responsible for removing existing tanks and installing new ones. Murphy was the head of Corporate Environmental Affairs until the end of 1989, and the Assistant General Counsel. Blackburn was Baxter's Senior Counsel until the end of 1989, and subsequently the Vice-President of Environmental Affairs. All had been in the company for over fifteen years.

Baxter's and Lilly's environmental policies have been significantly influenced by the history of their problems with the EPA. Hence, these leaders emphasized that removing *all* USTs and incorporating Type 2 features had significant symbolic value for both the internal and the external constituents of these firms. They invoked their firms' previous experiences with the EPA and State Environmental Agencies to argue for proactive UST policies. Further, they argued that it was in the long-term business interest of the firm (and therefore in their interest) to remove USTs. Hence Baxter's *State-of-the-Environment* Report observed that:

Contamination by leaking underground storage tanks used to store petroleum or other hazardous substances poses an environmental risk and liability exposure that is likely to escalate with time. Given the high costs of dealing with contamination from underground tank leaks, the money being spent for tank removals now before conditions worsen is clearly money well spent (1995a: 21).

Baxter treats every facility as a profit-center; revenues and costs are separately calculated for every facility and capital expenditures are financed from facility budgets. As a result, facility managers have incentives to oppose expenditures which do not reduce their monetizable costs. I therefore expect that these managers would have opposed the Type 2 features of the UST program. Policy-supporters in Baxter anticipated this opposition and sought to overcome it by making UST removal a corporate-level program. Hence, expenditures for removing UST appeared non-rival to projects which a particular facility manager was promoting. For a facility manager, this program created concentrated benefits (even though non-monetizable) and diffused costs. Hence it was a natural candidate for their support.

Further, policy-supporters realized that since the favorable stance of the former policy-skeptics may not last for ever, it was necessary to have an accelerated program for removing USTs. Hence the *Baxter Environmental Review* reminded facility environmental managers that:

Financial reserve accounts have been established at the corporate level to fund the removal of all tanks. This fund will pay expenses for removal of the UST (s), environmental assessment of the subsurface conditions surrounding the tank(s), and clean-up of any contamination costs that may exist... *we do not expect the financial reserve accounts will be available to fund UST*

removal after 1990, so it is important to finalize UST removal and replacement now (Baxter, 1989: 21; italics mine).

In Eli Lilly, the policy-supporters (belonging to Legal Affairs and Environmental Affairs) struck an alliance with facility managers. As discussed before, nearly 97 percent of Lilly's USTs were concentrated in its two biggest facilities -- Clinton, Indiana and Tippecanoe, Indiana -- and facility managers had incentives to have all USTs replaced with sophisticated above-the-ground tanks since it reduced risks associated with manufacturing operations. Thus, this coalition championed the removal of all existing USTs (both flow-through process as well as non-flow through process) and replacing them with expensive modular tanks.

Lilly's leaders also emphasized that historically, Lilly has been at the cutting edge of the UST technology. As early as 1953, Lilly hired Robert Howe to construct waste-treatment plant in its production facilities. Howe constructed a state-of-the-art treatment plant so that waste resulting from fermentation process (required for producing an antibiotic -- mycelia) could safely be put in landfills. Howe's pioneering efforts created a lot of credibility with regulators who often turned to him for advice. Hence, it was argued that the proposed UST program was keeping with the tradition of being industry leaders in the UST technology.

Finally, in both firms, the adoption of the UST program did not upset the status quo. Extant organizational structures were employed to implement the new policy, although task-specific groups were also set up. Policy-skeptics did not oppose adopting this program since it did not threaten their standing within the organization.

To summarize, both Baxter and Lilly invested significant sums in Type 2 features of

their UST program. However, such capital-expenditures were not subjected to capital-budgeting, although efficiency-based theories predict that they should be. Leadership-based theories best explain the adoption of this policy. Policy-supporters did not impose this policy on policy-skeptics. They succeeded in convincing policy-skeptics of the long-term benefits of adopting the Type 2 features. However, policy-supporters provided no monetary estimates of such benefits. As a result of such persuasions, policy-skeptics eventually changed their preferences on incorporating Type 2 features in the UST program.

Table 4.1
UST Population Affected by EPA Regulations

	<i>Number of USTs (in Thousand)</i>	<i>Percentage of Total USTs</i>
1. Retail Motor Fuels	676	49
Jobbers	161	11
Refiners	164	12
Dealers/Convenience Stores	333	24
Independent Chains	18	2
2. Non-Retail Motor Fuels	651	47
Services	54	4
Transportation	58	4
Manufacturing	75	5
Agriculture	86	6
Government: Non-Military	98	7
Wholesale and Retail Trade	136	10
Mining	14	1
Communication and Utilities	39	3
Construction	42	3
Government-Military	49	3
3. Chemical Storage	54	4
Manufacturing	27	2
Wholesale and Retail Trade	14	1
Others	13	1
TOTAL	1381	100

Source: Adapted from U.S. Environmental Protection Agency, "Underground Storage Tanks: Technical Requirement, Proposed Rules," *Federal Register*, April 17, 1987, pp. 12662-12664.

Table 5.2
EPA's Time Plan for Implementing UST Guidelines

<i>Type of Tank and Piping</i>	<i>Install Leak Detection by</i>	<i>Install Corrosion Protection by</i>	<i>Install Spill/Overfill Prevention by</i>
Tanks and Piping Installed After December 1988	At the time of installation	At the time of installation	At the time of installation
Existing Tanks Installed			
Pre 1965 or unknown	December 1989	December 1998	December 1998
1965-1969	December 1990	December 1998	December 1998
1970-1974	December 1991	December 1998	December 1998
1975-1979	December 1992	December 1998	December 1998
1980-Dec 1988	December 1993	December 1998	December 1998

Source: Adapted from U.S. Environmental Protection Agency, *Musts for USTs* (1988: 17)

Table 5.3
Baxter's Experience: 77 USTs at 32 Sites

	<i>Percentage of Sites</i>	<i>Average Cost of Clean-Up/Removal (in US\$)</i>
No Contamination	41	18,500
Soil contamination Only	34	61,000
Groundwater and Soil Contamination	25	262,000

Source: Adapted from *Baxter Environmental Review* (May 1990: 23).

Table 5.4
Baxter's Progress on UST Removal Program

	<i>Number of USTs</i>	<i>Number of USTs in U.S., Canada, Puerto Rico</i>	<i>Number of USTs in Other Locations</i>
1980	240	200	40
1988	175	140	35
1990	60	30	30
1992	25	-	25
1994	6	-	6

Source: Baxter's *State of the Environmental Program* (1995a: 21).

Table 5.5
USTs in Eli Lilly

	<i>1986</i>	<i>1991</i>	<i>1994</i>
U.S. Facilities	295*	249	22
Clinton, IN	123	87	20
Tippecanoe, IN	155	155	-
Others	7	7	2
Non-U.S. Facilities	*	24*	24*
TOTAL	295*	273	44*

* This is a partial list as many non-U.S. facilities did not know or did not report these numbers.

Source: Estimated from Table 36 of Eli Lilly's *Environmental Annual Report 1995c* and Page 24 of Eli Lilly's *Environmental Annual Report 1992a*

Chapter 5

The Toxic Release Inventory and the 33/50 Programs

Background

The Bhopal disaster of 1984 underlined the dangers of living in the vicinity of facilities using, manufacturing, or emitting toxic chemicals.⁹⁹ Responding to public concerns, the U.S. Congress enacted the Emergency Planning and Community-Right-to-Know-Act (EPCRA) in 1986. This requires state and local governments to develop emergency response plans for unanticipated releases of certain toxic chemicals.

Section 313 of EPCRA requires firms with manufacturing facilities in the U.S., as well as certain federal government facilities, to submit annual reports (Form R) to the EPA on the quantities of Section 313 chemicals released by them to the environment either routinely or due to accidents. For example, if a facility releases 20 such chemicals, then it is required to submit twenty separate forms. Importantly, these releases are required to be reported even though legal. By July 1 of the year following the reporting year (for example, July 1, 1997 for reporting year January 1, 1996 - December 31, 1996), facilities must submit their report (Forms R) to the EPA and the designated state-level agency. A failure to send these reports can result in fines as high as \$25,000 per day.¹⁰⁰

Section 313 of EPCRA also requires the EPA to make this facility-specific data

⁹⁹ On December 3, 1984, the Bhopal facility of Union Carbide released methyl isocyanide causing deaths of thousands of people living in the vicinity of the facility.

¹⁰⁰ Facilities are also required to retain a copy these records and make them available for inspection by the EPA. If a facility closes permanently, then the owner/operator must keep such records. If there are no owners/operators, then such records should be sent to the EPA.

available to public. To this end, the EPA has developed a computerized database known as the Toxic Release Inventory (TRI) (BNA, 1996). The TRI does not regulate the releases of chemicals; it is only a reporting requirement. However, many of the TRI chemicals are regulated under other environmental laws such as Resource Conservation and Recovery Act (RCRA), Clean Air Act Amendments (CAAA), as well as various state environmental laws. For example, 170 of the 189 air toxic chemicals regulated under CAAA are on the TRI list. Similarly, 94 of the 126 priority pollutants listed under the NPDES (National Pollutant Discharge Elimination System) are on the TRI list. Therefore the TRI reporting requirements are also important for monitoring compliance with other environmental regulations.

The initial TRI reports created adverse publicity for firms. Many environmental groups published rankings of leading polluters -- "the dirty dozens" -- in their states and counties. Managers within firms were also shocked to realize that their facilities were releasing significant volumes of toxic chemicals. Consequently, firms faced pressures from external stakeholders and employees for reducing emissions of TRI chemicals.¹⁰¹

The TRI reporting requirements were the first milestone leading to the 33/50 program. The second milestone was the 1990 PPA (Pollution Prevention Act). Under the PPA, the U.S. Congress directed the EPA to address the lack of attention to source-reduction

¹⁰¹ Recently the EPA proposed doubling the number of substances that facilities have to report for TRI purposes. The Chemical Manufacturers Association (CMA) challenged EPA's proposal in a U.S. District Court. Though the court supported EPA's position, CMA has appealed this decision. According to the CMA, the TRI database seeks to provide information to communities on the releases of toxic chemicals to the environment and the proposed additions to the TRI do not fit this profile. Further, the CMA contends that the goal of the TRI program was to facilitate pollution-prevention and risk-reduction. However, the EPA proposal introduces use-reduction through material-accounting. This was not a part of the 1987 TRI initiative. The CMA fears that material accounting data may give competitors access to confidential information having significant business implications (CMA, 1996b: 12).

in existing environmental laws. Source-reduction refers to proactive measures to keep pollutants from entering the environment. This may be achieved by modifying equipment and processes, designing new products, or changing raw materials in existing products.

The first section of the PPA identified two reasons for the EPA's failure to address source-reduction. Existing laws and regulations tend to focus on waste treatment and do not encourage multi-media management of pollution (Baxter, 1991a). The Congress therefore directed the EPA to develop programs for correcting these features in existing laws. The EPA Administrator was required to send a report to the Congress every two years describing actions taken by the EPA for promoting source-reduction and the results obtained from such actions.

To create incentives for firms to reduce the releases of TRI chemicals and to implement the mandate of the PPA, the EPA proposed a program called 33/50 in February 1991. Under 33/50, the EPA encouraged firms with U.S.-based manufacturing facilities to *voluntarily* commit to reducing their releases of seventeen chemicals by 33 percent by 1992 and 50 percent by 1995 with 1988 as the baseline.¹⁰² Since prior to 1991, twenty-six states had established programs for reducing the use of toxic chemicals by manufacturing facilities, the 33/50 initiative only strengthened and accelerated such programs. The rationale for

¹⁰² Note that the EPA sought reduction in releases: that is, emissions and off-site transfers. Further, the reductions in off-site transfers included only those for treating and disposing; transfers for energy-recovery and recycling were kept outside 33/50 program's purview.

The seventeen chemicals identified under the TRI program were: benzene, cadmium and compounds, carbon tetrachloride, trichloromethane (chloroform), chromium and compounds, cyanides and compounds, lead and compounds, mercury and compounds, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, nickel and compounds, tetrachloroethylene, toluene, 1,1,1-trichloroethane, trichloroethylene, and xylenes (EPA, 1994a).

targeting these seventeen chemicals was that: (1) they have significant adverse impacts on human health and the environment; (2) they were used in large quantities by U.S.-based manufacturing facilities; (3) their releases relative to their total usage were high, suggesting inefficiencies in the production processes; and (4) their usage as well as releases could be reduced by employing pollution-prevention technologies and practices (EPA, 1994c).¹⁰³

1987 was the first year of TRI reporting. Due to these new and extensive reporting requirements in which firms were relatively inexperienced, the 1987 data were not considered very reliable. As a result, the EPA chose 1988 as the baseline year for the 33/50 program (EPA, 1994b).

The 1987 TRI report indicated that more than 16,000 U.S.-based facilities released at least one of the seventeen 33/50 chemicals and a total of 1.48 billion pounds. These facilities were therefore identified as the target group for the 33/50 program. By February 1994, the EPA had contacted nearly 7600 facilities of which 1216 (16 percent) agreed to participate in this program (EPA 1994c).¹⁰⁴ The EPA Administrator wrote to the chief executives of firms owning these facilities inviting them to join the 33/50 program. By contacting the chief executives, the EPA sought to encourage a pollution-prevention philosophy in the highest echelons of Corporate America (EPA, 1994c). Firms participating in 33/50 were promised certificates recognizing their participation and public recognition

¹⁰³ For example, terpene-based solutions and aqueous-based cleaners can replace methylene chloride (a 33/50 chemical) in vapor degreasing and metal cleaning operations. Sodium bicarbonate, wheat starch, water spray, and plasma etching can replace methylene chloride in paint stripping (EPA, 1994d).

¹⁰⁴ This again indicates that an exclusive focus on external factors under-specifies our explanations of why firms adopt or do not adopt beyond-compliance policies.

through periodic EPA reports and press releases.

The EPA did not create any new instruments for measuring 33/50's success; releases reported under EPCRA (TRI) were to be used for this purpose. The EPA promised to measure the success of this program only at the national level; not at a firm level. Thus if a firm did not meet its goals, it would not get adverse publicity. Firms also had the autonomy to focus their 33/50 goals on all/some of their facilities as well as all/some of the 17 identified chemicals. Emphasis on aggregate releases instead of releases of individual chemicals and facilities provided flexibility to firms for developing 33/50 plans as a part of their overall corporate strategies.

The 33/50 program exceeded its 1992 objectives: releases of the seventeen targeted chemicals declined by 40 percent well above the 33 percent target. Further, during 1991-92:

1. Releases of the 33/50 chemicals declined at four times the rates of non-33/50 chemicals (10.4 versus 2.6 percent).¹⁰⁵ This is significant since prior to 1991, the reductions in releases of the 33/50 chemicals significantly lagged those of non-33/50 chemicals.
2. 33/50 facilities reduced their releases by 15 percent which is nearly twice the rate of non-33/50 facilities.
3. "The leaders-in reductions" role played by 33/50 chemicals is also reflected in the performance of the 33/50 facilities. Nine of the ten facilities reporting the greatest reductions in releases of TRI chemicals subscribe to the 33/50 program (EPA, 1994c).

The achievements of the 33/50 program are often understated. Firms report absolute reductions in their releases with 1988 as the baseline, even though their production levels

¹⁰⁵ Chemicals covered under TRI can be classified as 33/50 chemicals or non-33/50 chemicals. To reemphasize, under TRI firms are *required* to report their annual releases of individual chemicals (33/50 as well as non-33/50) on a facility-wise basis.

and/or the product-mix may have changed since 1988. Thus a firm undertaking significant pollution-prevention efforts may report increased releases of the 33/50 chemicals if its production has increased significantly and/or its product-mix has shifted to more pollution-intensive products. However, setting of absolute reduction goals (instead of goals controlled for variations in production/product-mix) may be justified since the levels of environmental degradation and adverse impacts on human health (which the 33/50 program sought to minimize) depend on the absolute releases of toxic chemicals and not releases relative to varying production levels.

Baxter and Lilly: Response¹⁰⁶

As indicated in Tables 5.1 and 5.2, both Baxter and Lilly took significant initiatives for reducing their releases of TRI chemicals and achieving the objectives of the 33/50 program. Both firms are charter members of the 33/50 program. Lilly has spent about \$80 million in its Tippecanoe and Clinton facilities for reducing releases of TRI chemicals, especially the 33/50 chemicals. Baxter has spent about \$10 million for reducing releases of TRI chemicals, air-toxics, CFCs, and 33/50 chemicals.

[Insert Tables 5.1 & 5.2 About Here]

Of the seventeen chemicals targeted under the 33/50 program, Lilly used toluene and

¹⁰⁶ This section draws extensively on Wilkins (1996) and Currie (1994).

methylene chloride in significant quantities; the latter accounting for over 70 percent of Lilly's releases. Methylene chloride is a quick evaporating liquid used as a solvent in paint stripping, metal degreasing, and chemical processing industries.¹⁰⁷ It is also used in pharmaceutical industry since it is: (a) significantly heavier than water making it attractive for product-separation processes; (b) non-inflammable; and © extremely volatile making it is useful in product crystallization processes (Lilly, 1996).

Some scientists claim that methylene chloride is carcinogenic in animals by both oral and inhalation routes and produces toxicity of liver, kidney, and the central nervous system.¹⁰⁸ Methylene chloride's use is therefore regulated under many existing laws such as the Clean Air Act Amendments of 1990 (hazardous air pollutant), Resource Conservation and Recovery Act of 1976 (groundwater monitoring list), Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (reporting quantity), and Superfund Amendments and Reauthorization Act of 1986 (National Priority List sites) (EPA, 1994d).

Lilly adopted three strategies for reducing the releases of methylene chloride.¹⁰⁹ First, given methylene chloride's propensity to quickly evaporate, Lilly sought to introduce new manufacturing methods and practices for better containing it within the facility. Second, to make methylene chloride harmless, it was to be centrally collected and incinerated. Third, Lilly focused on reducing methylene chloride's usage in its new products.

¹⁰⁷ Since it is colorless, its leakages often escape visual detection. However, since it is sweet smelling, its presence can be detected.

¹⁰⁸ However, there is no conclusive evidence that methylene chloride produces cancers in humans.

¹⁰⁹ These releases were legal.

For the first task, Lilly's top-management constituted a task-force known within the company as the 'fix-it' team. This team, led by Paul Wassell, sought to identify all possible leakpoints and valves, a tedious task given that manufacturing facilities have hundreds of miles of piping. At the same time, Richard Lattimer estimated the releases of methylene chloride by using sophisticated material-balancing equipment. This team thus had an estimate of the aggregate quantities of these leaks and points where they actually take place. To correct this gigantic problem, this team first experimented with many engineering and system innovations on a pilot basis in the Clinton facility.¹¹⁰ It succeeded in reducing emissions by 95 percent in one of the pilot sites. This innovation was then replicated in other sites within the Clinton facility, and subsequently, extended to other Lilly facilities. Apart from the fix-it team, the role of the SARA group (in-company task-force to implement Superfund Amendments and Reauthorization Act) was critical in organizing Lilly's attempt to reduce the releases of TRI chemicals. John Wilkins and Richard Lattimer, both of Corporate Environmental Affairs, played critical roles in organizing monthly meetings for tracking progress and intra-Lilly pollution-prevention conferences. As a result, there was a fair degree of employee involvement in programs for reducing emissions of TRI chemicals.

However, methylene chloride emissions did continue, albeit in smaller quantities. To reduce these emissions to a bare minimum, Lilly invested about \$80 million in its two facilities at Clinton and Tippecanoe for installing the state-of-the-art Regenerative Thermal Oxidizers (RTOs) or Fume Incinerators. All fumes from point sources, especially those

¹¹⁰ This facility was a significant emitter of ethylene chloride.

containing volatile organic chemicals such as toluene and methylene chloride, were centrally collected and incinerated in these RTOs. Methylene chloride and toluene, both 33/50 chemicals, could be completely destroyed by these RTOs. Since installing the RTOs involved significant Type 2 expenditures that were not subjected to capital-budgeting, these were initially opposed. However, the supporters of this project, especially Edward Smithwick, Vice-President of Bulk Manufacturing, and Richard Eisenberg, Executive Director of Corporate Environmental Affairs emphasized the need for proactive measures, even though their benefits were non-quantifiable. The proposal for installing the RTOs was initiated in 1988. The RTOs were finally installed in the Clinton facility in 1992 and in the Tippecanoe facility in 1993.

Lilly also attempted source-reduction by identifying non-toxic substitutes of methylene chloride. This involved employing a new management system known as NPERT (New Product Environmental Requirements Tracking). NPERT requires identifying environmental challenges in the early stages of process development of new drugs. Lilly employed NPERT in developing Raloxifene, a drug which can potentially treat and prevent osteoporosis. The Raloxifene team successfully altered the process chemistry eliminating methylene chloride from the manufacturing process and replacing it with a less volatile solvent that was easier to contain within the manufacturing plant. This team also eliminated/reduced other solvents (specifically polyphosphoric acid) from the manufacturing process resulting in a 74 percent reduction in total solvent use compared to the previous process. As shown in Table 5.3, consequent to the efforts of the fix-it team, the new RTOs, and the NPERT process, Lilly reduced its releases of 33/50 chemicals by 81 percent between

1988 and 1995, well exceeding EPA's target of 50 percent reduction. The releases of methylene chloride, the key 33/50 chemical, were reduced by 77 percent by 1995 compared to 1988 levels.¹¹¹

[Insert Table 5.3 About Here]

Baxter also adopted beyond-compliance policies in response to TRI. As discussed previously, the TRI database has given external stakeholders access to information on facility-wise releases of toxic chemicals. Consequently, during 1989-1991 Baxter faced considerable adverse publicity in many states and counties where its facilities were located. This prompted some managers to suggest aggressive programs for proactively reducing the releases of TRI chemicals. A technical team within Baxter headed by Vice-President-Technical Charles Kohlmeyer was established for evaluating the technical feasibility of reducing emissions of key TRI chemicals. A number of task-forces were set up to focus on individual chemicals. For example, Kohlmeyer himself chaired the task force on ethylene chloride and methanol; Rob Currie chaired the task force on trichloroethane. Baxter has spent over \$10 million on projects for reducing the releases of TRI and other chemicals.

These proactive steps for reducing the releases of TRI chemicals had significant *ex post* payoffs. In 1991, when the EPA invited Baxter to join the 33/50 program, Baxter already had on-going programs for meeting most of the 33/50 goals. On May 14, 1991,

¹¹¹ This team's efforts and the NPERT process were awarded the 1995 Indiana Governor's Award for Excellence in Pollution Prevention.

Vernon Loucks, Baxter's chief executive, wrote to the EPA on Baxter's commitment to joining the 33/50 program. In his letter, Loucks committed to even higher standards than required by the 33/50 program. Instead of a 50 percent reduction in releases by 1995, Baxter set a target of 80 percent reductions. In addition, Baxter established an 80 percent reduction goal for CFCs and 189 other chemicals covered by the Clean Air Amendments (Baxter, 1991b).¹¹² Importantly, Baxter set these *minimum* goals for facilities all over the world; facilities and divisions could set even more aggressive goals for themselves.¹¹³

Baxter's followed a three-stage process to meet the 33/50 program goals. It accorded source-reduction the highest priority. If source-reduction was infeasible, then recycling was to be considered. If recycling was also infeasible, then treating chemicals (and converting them to harmless compounds) was to be the route for meeting the 33/50 program goals. However, treatment was to be considered only as an interim measure; corporate research and development teams continued efforts to identify alternative processes or materials.

As shown in Table 5.4, Baxter reduced its releases of the 33/50 chemicals by 96 percent: from 900,000 pounds in 1988 to about 37,000 pounds in 1995, inspite of a 20 percent increase in company-wide production.

[Insert Table 5.4 About Here]

¹¹² This goal was based on equivalent product output.

¹¹³ Baxter used at least 8 of the 17 chemicals identified by the EPA in the 33/50 program. These were: chloroform; chromium and chromium compounds; methylene chloride; methyl ethyl ketone; nickel and nickel compounds; toluene; 1,1,1-trichloroethane; and trichloroethylene. Of these eight chemicals methyl ethyl ketone and 1,1,1-trichloroethane were used in significant quantities (Baxter, 1991a).

Some of the key projects for implementing the 33/50 program are described below:

- * Bentley Laboratories in Irvine, California, develops, manufactures, and markets disposable medical devices used for blood oxygenation during cardiopulmonary surgery. This facility reduced the emissions of 1,1,1-trichloroethane in two stages. In stage one, emissions were reduced by over 80 percent by 1990 by modifying process leach tanks and instituting operational changes. Initially, this facility resisted undertaking capital expenditure of about \$50,000 for this task. However, persistence and persuasion by some managers, especially Rob Currie, resulted in implementation of these initiatives. In stage two, by adopting a newly developed proprietary technology, which eliminated using 1,1,1-trichloroethane, these emissions were reduced to zero by 1991.
- * The V. Mueller division manufactures a complete line of general and specialty surgical instruments, a line of endoscopic products for laparoscopic surgery, and the Genesis Container system. Mueller's St. Louis, Missouri facility totally eliminated the releases of 1,1,1-trichloroethane (8,000 pounds per annum in 1988) by installing aqueous-based cleaning system.
- * The Mannford facility in Oklahoma manufacturing a board line of surgical and medical products such as disposable/reusable gowns, disposable drapes, and surgical packs, reduced its emission of methyl ethyl ketone by 60 percent between 1988 and 1994. This was achieved by modifying manufacturing process and reducing fugitive losses.

Although not required under the TRI or the 33/50 programs, Baxter's international facilities also significantly reduced their toxic emissions. Some examples:

- * The Euromedical facility in Malaysia reduced methylene chloride emissions by over 100,000 pounds with 1988 as the baseline. This was achieved through changing material handling and modifying equipment.
- * Methyl ethyl ketone emissions in the various maquiladora facilities located in Mexico near the US border were reduced by over 90,000 pounds with 1988 as the baseline by operational changes and tank modifications.

Puzzle

Why did Baxter and Lilly invest significant sums for reducing the releases of TRI chemicals without subjecting them to investment analysis? Lilly invested in excess of \$80 million for installing state-of-the-art RTOs even though less expensive incinerators (\$40-50 million) meeting compliance requirements were available. Baxter invested more than \$10 million for reducing emissions of TRI chemicals and air toxics.

Further, why did Baxter and Lilly join the 33/50 program? As indicated before, only 16 percent of U.S.-based manufacturing facilities releasing at least one of the seventeen 33/50 chemicals joined this program.

Predictions of Theories of Firms

As discussed in Chapter 2, managers often subject major investments to capital-budgeting. Efficiency-based explanations suggest that firms will not adopt Type 2 projects since they do not meet or exceed the profit criteria. Since neither Lilly nor Baxter subjected their TRI program expenditures to capital-budgeting, efficiency-based explanations suggest that these firms would not have invested millions of dollars in these programs. Baxter's and Lilly's behaviors are thus anomalous to the predictions of efficiency-based theories.

Due to their TRI investments, neither Baxter nor Lilly required significant capital-expenditures to meet the 33/50 program goals. However, they were required to invest resources in creating procedures for documenting progress and reporting it to the EPA. Consequently, the costs of joining 33/50 program were short-term and quantifiable while the

benefits were long-term and non-quantifiable. Efficiency-based explanations therefore suggest that neither Lilly nor Baxter would have joined the 33/50 program.

Power-based explanations predict that Baxter and Lilly would have invested in reducing emissions of TRI chemicals and the 33/50 program only if policy-supporters could “capture” the top-management and have it overrule objections of policy-skeptics. Consequently, we should expect little organizational consensus on this policy. Leadership-based explanations suggest policy-supporters succeeded in generating consensus over these policies by convincing skeptics that such expenditures served the long-term interests of their firm, even though they may not generate quantifiable profits.

Analysis

Why should firms seek to reduce their releases of TRI chemicals or join the 33/50 program? The initial TRI reports generated adverse publicity for many firms. In 1988, Lilly was identified as one of the top ten emitters of TRI chemicals in the state of Indiana. Baxter was listed as a leading polluter in many states and counties (See Appendix 5.1). Further, even when some firms reduced their releases of TRI chemicals, they continued to be identified as emitters of toxic materials. For example, *The Arkansas Gazette*, in its eye-catching caption “**Toxin level drops by half in 1 year, study says,**” reported that:

The latest figures from the federal Toxics Release Inventory show that Arkansas industries discharge less than half as many toxic chemicals in 1990 as in 1989 Another example of dramatic reduction was Baxter Healthcare Corp. which reduced its total toxic emissions from 609,600 pounds in 1989 to 432,308 pounds in 1990 (March 19, 1992, Arkansas Page).

Even complementary news items such as the foregoing reinforce an image that firms continue to be significant emitters of toxic chemicals. Clearly, adverse media coverage created pressures on both Baxter and Lilly from their external stakeholders as well as employees for reducing releases of TRI chemicals.

Many managers argued that the TRI program was a strategic step by the EPA to prepare the ground for stringent regulations. They suggested that the 33/50 program was a prototype for new laws if “voluntary” compliance from industry was not forthcoming. The EPA Administrator, William K. Riley, in his letter to Vernon Loucks, the Chief Executive Officer of Baxter, noted that:

The American public has made clear that they expect nothing less than dramatic reductions in toxic chemicals releases. The challenge before EPA and industrial leaders is this: how do we bring such reductions about? One way is by the conventional command-and-control option which has been the Agency's mainstay for the past twenty years. But I believe there is another, more fruitful path that we can follow which is faster, and *without the detailed direction which is likely to be demanded by the public if voluntary efforts are not fruitful* (Baxter, January 1991; italics mine).

Riley's message is very clear: either industry should “voluntarily” commit to such reduction, or citizens will demand that the government intervene. Such interventions, typically in the command-control mode, will leave little autonomy for firms on issues such as which chemicals to reduce, which technology to employ, and the time frame of implementation.

Assuming that industry did understand Riley's message, what incentives did

individual firms have to actually join the 33/50 program or voluntarily reduce the releases of TRI chemicals? Why couldn't individual firms free-ride on the efforts of other firms? How did the institutional design of the 33/50 program and the TRI reporting requirements mitigate collective action dilemmas?

The TRI reporting requirements and the 33/50 program created two categories of benefits. First, citizens benefited from having a cleaner environment. Since these benefits are non-excludable, firms producing such benefits cannot force citizens to pay for them. As a result, firms have little incentive to provide these benefits. Second, these programs create goodwill benefits for firms among regulators and citizens. These programs also raise the morale of employees. Such goodwill benefits accruing to firms are excludable since it is possible to identify firms that have invested in reducing the releases of TRI chemicals or have joined the 33/50 program. Citizen groups and journalists often monitor firms' performance on reducing TRI emissions, and advertise them. EPA also enhances the excludability of such benefits by regular media reports on 33/50 success stories or trends in releases of TRI chemicals.

What were the strategies adopted by policy-supporters to convince their skeptical colleagues of the benefits of such Type 2 programs? As discussed previously, the first TRI report was sent to the EPA in July 1988. In the process of quantifying releases of TRI chemicals, policy-supporters in Lilly realized the potential for bad press once this information became public knowledge. As early as 1988, they suggested that Lilly should be prepared to invest millions of dollars to proactively reduce its emissions of methylene chloride. At first, there was resistance to this proposal since its benefits were not

monetizable. Skeptical managers argued that since Lilly adheres to existing emission laws, there was no need for further reductions at a substantial cost. However, the supporters pointed out that consequent to the TRI reports, Lilly had been identified as one of Indiana's leading emitters of TRI chemicals. The Clinton and Tippecanoe facilities had been ranked fourth and fifth nationally as emitters of methylene chloride. In addition, it is necessary for Lilly to remain on good terms with the EPA and proactive reductions in emissions of TRI chemicals would facilitate this.

Edward Smithwick, Vice President, Bulk Manufacturing, and Richard Eisenberg, Executive Director of Corporate Environmental Affairs, in particular, were key figures in persuading their skeptical colleagues of the long-term benefits, even though not quantifiable, of proactively reducing TRI emissions. The advocacy by Smithwick was important since the expenditures on reducing TRI emissions were borne by facilities. Since every facility is a profit-center, one expects facility managers and their organizational superiors (such as Smithwick) not to support programs that reduce monetizable profits.

Once the TRI chemical reduction program was in place, 33/50 targets could be achieved easily. Consequently, in 1991, when the EPA invited Lilly to join the 33/50 program, policy-supporters met with only marginal opposition.¹¹⁴ Policy-supporters pointed out that since Eisenberg served on the Federal Advisory Committee on the Clean Air Act, it was difficult for Lilly not to join the 33/50 program.

Baxter also invested in excess of \$10 million for reducing its releases of the TRI and

¹¹⁴ As discussed earlier, this opposition was due to the additional expenditures required for documenting and reporting progress to the EPA.

other toxic chemicals. Policy-supporters adopted an interesting strategy by making this project a part of Baxter's overall objective of establishing a state-of-the-art environmental program. As discussed in Chapter 3, Baxter's environmental program faced rough times in the mid 1980s primarily owing to Baxter's merger with the American Hospital Supply Corporation.

In 1989, some of Baxter's senior managers realized the long-term costs of having reactive environmental policies. This coalition of senior managers, specifically, William Blackburn, Charles Kohlmeyer, and G. Marshall Abbey (and subsequently, Arthur Staubitz), argued for establishing a state-of-the-art environmental program within Baxter. They eventually managed to convince Vernon Loucks, Baxter's Chief Executive, of its long-term payoff. In the process of operationalizing this ambitious mandate, these managers included programs for reducing the releases of TRI chemicals. They very astutely linked these programs to reductions in the emissions of CFCs, chemicals that had been identified as main causes of the Ozone Hole and whose use and production had been regulated under the Montreal Protocol of 1987. Further, the TRI reduction program was subsumed under a broader program for waste-reduction and pollution-prevention.

There was opposition from facilities on two counts. First, they were hesitant to commit to ambitious and still undefined state-of-the-art goals. Second, since facilities were profit-centers, they bore the costs of such programs. These policy-supporters induced acceptance through persuasion and provision of technical help. They consciously decentralized the implementation of various pollution-prevention and waste-minimization programs and facility managers were encouraged to come up with solutions. As discussed

previously, a number of task forces were set up for implementing this program. For example, Kohlmeier chaired the task force on ethylene chloride and methanol; Rob Currie chaired the task force on trichloroethane.

The policy-supporters regularly publicized the progress made by facilities and contributions of specific managers towards reducing the releases of TRI chemicals, 33/50 chemicals in particular (for example, Baxter, 1994a). Baxter's annual environmental conferences, often attended by about 200 managers, were extremely valuable in providing in-company visibility to high performers. Also, Baxter's bi-monthly in-house magazine *PACE*, circulated to all its 60,000 employees consciously highlighted the achievements of such programs. This created incentives for the facility managers to enthusiastically adopt this program since they did not want to be identified as Baxter's "bad guys". In his letter to the EPA, Rob Currie, Baxter's 33/50 coordinator noted that:

Baxter has found that communication and awareness are key to implementing successful pollution prevention and waste minimization programs. As a result, several vehicles to foster communication are used to bolster facility programs At the 1993 conference, facilities accepted Baxter's *Pollution Prevention Challenge* focused on calculating the economic value of "waste." Often the raw material value of waste exceeds the disposal costs or the recycling revenue (Currie, 1995).

Many of Baxter's waste-minimization initiatives generated monetary profits *ex post*. Rob Currie, in his letter to the EPA, said, "At Baxter, we not only dramatically reduced toxic releases, but saved money as well" (Currie, 1995).

To summarize, Baxter's and Lilly's investments for reducing releases of TRI

chemicals required significant up-front capital-expenditures, efficiency-based theories predict that these policies would be subjected to capital-budgeting processes. However, they were not. Since their adoption was consensual, they are best understood by employing leadership-based theory.

Baxter's and Lilly's TRI investments enabled them to meet the 33/50 goals without significant capital-expenditures. However, these firms were required to invest in establishing procedures for documenting and reporting progress to the EPA. The benefits to these firms from joining 33/50 were long-term and intangible while the costs were quantifiable and short-term. Hence, Baxter's and Lilly's decision to join the 33/50 program is anomalous to the predictions of efficiency-based theories and is best understood in terms of leadership-based theories.

Table 5.1
Major TRI & 33/50 Program Projects at Lilly

<i>Year of Completion</i>	<i>Project</i>	<i>Cost in millions</i>
1988	Upgrade thermal oxidizer at Tippecanoe	\$2
1990	Install plume suppression for fume incinerators at Tippecanoe	\$6
1992	Install regenerative thermal oxidizers at Clinton	\$37
1993	Install regenerative thermal oxidizers at Tippecanoe	\$40
1993	Methylene chloride emissions reduction projects at Clinton	\$1
1994	Install air emission control equipment for bulk pharma manufacturing at Tippecanoe	\$9
1994	Connect C9 to the regenerative thermal oxidizer at Clinton	\$1

Source: Lilly's *Environmental Annual Report* 1992, pp. 9

Table 5.2
Major TRI and Waste-Minimization Projects at Baxter

<i>Project Description</i>	<i>Project Location</i>	<i>Cost in million</i>
Install ethylene oxide control devices	Anasco/CVG Mt. Home Cleveland Aibonito Jayuya Singapore Colombia	\$4.0
Install ethylene oxide/CFC-12 recovery system	Uden	\$0.4
Install capture and control system on part washing equipment	Irvine/CVG Mt. Home Anasco/CVG Anasco/Biotech Castelbar/Swinford	\$2.3
Convert to water-based coagulant, and install catalytic converters	Johnson City Kingstree Malaysia Exam Malaysia Surgical	\$1.7

Source: Baxter's *State-of-the-Environmental Program Report 1994*, Table 5, pp. 10.

Table 5.3
Lilly's Performance on the 33/50 Program

	<i>Total Releases (in pounds)</i>	<i>Index versus Baseline Year 1988</i>
1988	575,000	100
1991	450,000	69
1992	780,000	136 (EPA Target: 67)*
1993	500,000	87
1994	100,000	17
1995	110,000	19 (EPA Target: 50)

* This increase in releases was due to launching of new products requiring 33/50 chemicals for their manufacturing.

Estimated from: Eli Lilly (1992, 1996)

Table 5.4
Baxter's Performance on the 33/50 Program

	<i>Total Releases (in Pounds)</i>	<i>Index versus Baseline Year 1988</i>
1988	873,000	100
1992	86,000	10 (EPA target: 67)
1994	42,000	5
1995	37,000	4 (EPA target: 50)

Source: Baxter (1996)

Chapter 6 Responsible Care

Background

Founded in 1872, the Chemical Manufacturers Association (CMA) is one of the oldest trade and industry association in the U.S. Its 200 members together account for about 90 percent of US industrial capacity in basic chemicals (CMA, 1996a). As a result, the CMA is often viewed as the most authoritative spokesperson of the U.S. chemical industry.

Responsible Care is CMA's flagship program for improving the chemical industry's performance in the areas of health, safety, and the environment.¹¹⁵ Responsible Care also serves as CMA's main vehicle for legislative, regulatory, and legal interventions at the state, national, and international levels. In addition to sponsoring Responsible Care, the CMA also conducts regular surveys on public perceptions of chemical industry and of CMA's initiatives. Based on these surveys, the CMA designs and undertakes new initiatives. The CMA also advertises in magazines and television to communicate its perspective and achievements.¹¹⁶

The 1980s were a mixed blessing for the U.S. chemical industry. On the one hand, its economic performance was impressive: it was ahead of most other industries in exports, research and development expenditures, and wages paid to its manufacturing workers

¹¹⁵ Health and safety policies impact actors within the premises of a facility while environmental policies impact actors outside the physical premises as well as the natural environment. In the U.S., health and safety aspects are dealt with by the Occupational Health and Safety Agency (OSHA) and its state and county level counterparts. On the other hand, environmental aspects are dealt with by the Environmental Protection Agency (EPA) and its state and county counterparts.

¹¹⁶ For example, in 1992-93, the CMA spent about \$9 million on advertising (*Chemical and Engineering News*, 1992b).

(*Chemical and Engineering News*, 1992b). However, its credibility with regulators and other stakeholders on its performance on environment, health, and safety aspects plummeted. As shown in Table 6.1, a series of major chemical accidents, including the Bhopal disaster in 1984, reinforced a perception that the chemical industry cannot conduct its operations without harming human health and damaging the environment. Hence, there were demands that the agencies of governments (typically federal but also at the state and local levels) should intervene by stipulating command and control laws that leave little operational autonomy for chemical firms. Industry leaders were concerned that such high levels of policy activism and the accompanying uncertainty would undermine investors' confidence in the long-term prospects of chemical industry and hurt its stock prices. Further, they argued that the ever-increasing compliance requirements would divert scarce resources from research and development, and eventually hurt the industry's international competitiveness.

[Insert Table 6.1 About Here]

The chemical industry had almost anticipated a major disaster such as Bhopal and the accompanying regulatory backlash. In 1983, one year prior to the Bhopal tragedy, the CMA had developed a statement of principles on how the chemical industry should conduct its business and relate to its stakeholders. This statement eventually became the basis for developing the ten Guiding Principles of Responsible Care (see below). However, the scale of the Bhopal disaster altered the character of discourse on how the industry ought to be

regulated; immediate and drastic actions were demanded.¹¹⁷ To introduce public accountability of its activities, in 1985, the CMA proposed a voluntary program, Community Awareness and Emergency Response (CAER). Eventually CAER became one of the six Codes of Responsible Care (see below). Since many environmental groups saw CAER as a public relations gimmick, in late 1985, the CMA formed the Public Perception Committee composed of top industry executives. This was a precursor of the Executive Leadership Groups, an important feature of Responsible Care. The Public Perception Committee recommended that the CMA launch Responsible Care.¹¹⁸

Responsible Care seeks to change the culture of the chemical industry. It is an attempt by the chemical industry to regain public trust by demonstrating that chemical firms are responsible corporate citizens who can self-regulate. Surveys commissioned by the CMA suggested that the public did not trust the industry since chemical firms seldom shared information on their operations, the risks their activities posed to communities in the vicinity of their facilities, and their plans for dealing with industrial accidents.

Then why did the industry not share information with the public? Most managers

¹¹⁷ In response to the Bhopal disaster, in 1986 the U.S. government enacted the Emergency Planning and Community-Right-to-Know Act (EPCRA). Section 313 of EPCRA created the Toxic Release Inventory (TRI) database (Chapter 5) that gave the public access to facility-specific data on releases of toxic chemicals into the environment. This act also required the state and local governments to develop emergency response plans for dealing with industrial accidents.

¹¹⁸ Who is credited with the idea of launching Responsible Care in the U.S.? It is said that since 1985 the Canadian facilities of Union Carbide had been implementing a version of Responsible Care. During a review of Canadian operations, Robert D. Kennedy, Chief Executive Officer of Union Carbide, was informed of this initiative. Kennedy quickly gauged the potential benefits of having this as an industry-wide program and passed on this information to CMA's Public Perception Committee. The committee members bought into Kennedy's suggestion and thus the CMA adopted Responsible Care as its flagship initiative (*Chemical and Engineering News*, 1992b).

believed that as long as firms follow laws and regulations, communities or other stakeholders had little legitimacy for demanding information on how firms manage their operations. This attitude was clearly counter-productive, especially in light of major industrial accidents, and accentuated the gulf between the industry and the various publics.

Responsible Care was launched in the U.S. in 1988. Versions of this program have also been adopted by at least twenty other CMAs located abroad. Three categories of actors have subscribed to Responsible Care: (1) members of the CMA; (2) partner companies, particularly those in the transportation sector: railroads, trucking, and barge. Note that these firms are not members of the CMA ; (3) partner associations such as the state chemical industry councils and the national associations of firms that deal with chemicals. For example, the Synthetic Organic Chemical Manufacturers Association (SOCMA) has endorsed Responsible Care (*Chemical and Engineering News*, 1993a).¹¹⁹

Responsible Care has the following features:¹²⁰

- (1) Ten Guideline Principles spelling out responsibilities of CMA member firms (details below).
- (2) Six Codes of Conduct that identify more than one hundred specific management practices. These Codes seek to establish management systems

¹¹⁹ In December 1990, the SOCMA adopted Responsible Care's ten Guiding Principles and the CAER code as requirements for its membership. The SOCMA has 220 members: 150 in manufacturing and 220 in services. Of the 150 manufacturing firms, 60 are members of the CMA. Hence, the SOCMA is targeting the rest 90 firms. These targeted firms have turnovers of less than \$40 million (*Chemical and Engineering News*, 1992b). As discussed subsequently, a major challenge is creating incentives for small firms to adopt documentation-intensive industrial codes of practices such as Responsible Care and ISO 14000 (Chapter 7). Hence, the support of associations such as the SOCMA is critical for encouraging small firms to adopt environmentally-sound management systems.

¹²⁰ The description of Responsible Care and its various elements is based on literature received from Chemical Manufacturers Association (no date) and Lilly (no date), as well as *Chemical and Engineering News* (1993b).

in manufacturing, distribution, and transportation (details below).

- (3) A fifteen member Public Advisory Panel consisting of non-CMA members to guide Responsible Care. This panel is expected to sensitize the CMA to public concerns and give input on developing programs that better address these concerns.
- (4) A requirement that all the member firms will adopt Responsible Care.¹²¹ Firms are not required to implement all the six Codes immediately; they can chart their own time frame for implementation.
- (5) Member firms must annually evaluate their progress on implementing the six Codes of Responsible Care. This evaluation should be shared with the CMA.
- (6) Executive Leadership Groups of senior industry representatives to periodically share their experiences on implementing Responsible Care and to identify areas requiring assistance from the CMA.

As suggested above, the CMA has identified six Codes of Conduct. Though these Codes identify desirable management practices, they do not specify how particular tasks need to be done. The main features of these Codes are summarized below.

Code 1. Community Awareness and Emergency Response

Approved: November 6, 1989

Objective: Ensure emergency preparedness and foster community-right-to-know.

Requirements:

- * Develop community outreach programs for communicating information on environment, health, and safety aspects of facility's operations.
- * Develop programs for responding to emergencies. Test these programs annually involving all relevant publics.

¹²¹ What if members do not implement Responsible Care? In 1993, the SOCMA expelled Pfister Chemical, Ridgefield, N.J. since Pfister declined to adopt Responsible Care (*Chemical and Engineering News*, 1993a). This seems as being the sole example of a firm losing its membership in the CMA or its partner association (such as the SOCMA) for non-adoption of Responsible Care.

Code 2. Pollution-Prevention

Approved: April 6, 1990 (waste and release practices); September 5, 1991 (waste management practices)

Objective: Promote pollution-prevention and waste-minimization.

Requirements:

- * Document waste generation, estimate their releases to various media, and evaluate their potential health, safety, and environmental impacts.
- * Seek employee and public input for developing and implementing waste-minimization and pollution-prevention policies.
- * Emphasize source-reduction and include pollution-prevention as an objective at the research and development stage.

Code 3. Process Safety

Approved: September 10, 1990

Objective: Prevent industrial accidents.

Requirements:

- * Develop process safety programs. Document and measure safety performance.
- * Audit safety systems. Conduct safety reviews of new/modified facilities before commissioning them.
- * Train employees in safety procedures.

Code 4. Distribution

Approved: November 5, 1990

Objective: Minimize risks posed by transportation and storage of chemicals to carriers, customers, contractors, employees, and the environment.

Requirements:

- * Evaluate risks associated with existing modes of

transportation and distribution.

- * Train employees, carriers, and contractors on the regulations and best practices.
- * Regularly review the performance and practices of carriers.
- * Develop an emergency response plan for dealing with transportation accidents.

Code 5. Employee Health and Safety

Approved: January 14, 1992

Objective: Protect and promote health and safety of employees and visitors at facilities.

Requirements:

- * Develop and review occupational safety systems; audit them; train employees.
- * Select vendors and contractors that follow the above guidelines; audit them.
- * Investigate trends in workplace illness, injuries, and accidents.

Code 6. Product Stewardship

Approved: April 16, 1992

Objective: Promote safe handling of chemicals from their initial manufacture to their distribution, sale, and disposal.

Requirements:

- * Develop a corporate plan on product stewardship.
- * Incorporate environmental, health, and safety concerns in the product and process development stage.

These Codes were developed at different points in time by technical experts drawn

from CMA's members. Subsequently, every Code was scrutinized by CMA's Public Advisory Panel. In light of this Panel's recommendations, these Codes were revised prior to their final adoption. It is important to note that developing and ratifying these Codes was much more than a mere technocratic process. It was also a political process requiring cooperation from actors who often had different preferences on the scope of these Codes (see below). Given such differences, a strategy of piecemeal rather than simultaneous development and adoption of these Codes was very useful in preventing deadlocks.

Since the requirements of Responsible Care are extensive, what are the incentives for non-CMA members, particularly for the smaller firms, for implementing it? As shown in Table 6.2, smaller firms appear to be faring worse than larger firms on health and safety performance; injury rates per hundred employees are higher for smaller firms than for larger firms. On this count, any industrial code such as Responsible Care that seeks to improve environment, health, and safety management systems should focus on smaller firms.¹²²

[Insert Table 6.2 About Here]

Responsible Care requires industry giants and the smaller firms to harmonize management systems. Organizational structures of smaller firms typically reflect little functional differentiation; a given employee often wears many hats. Consequently, there are

¹²² This data needs to be carefully interpreted since contractors and vendors are treated as independent units and not as parts of the firms they work for. Thus, even if a contractor is working within the physical premises of a facility, it is treated as a separate entity for collecting employee injury data. One way to control for this bias is to collect data on an establishment-basis, not on a legal entity-basis. This is being done in Prospect, CMA's pilot program (*Chemical and Engineering News*, November 29, 1993).

fewer procedures and relatively less documentation of management systems.¹²³ Since Responsible Care requires establishing extensive well-documented management systems, smaller firms are reluctant to subscribe to it.¹²⁴ Further, many managers feel that far too many industry-level initiatives are being suggested at the same time and this is stretching their firms' already thin resources. As one manager put it:

There are too many initiatives coming at us all at once ... I know Responsible Care is an important program to help the industry regain public trust, but I think we are trying to make up for the sins of the past too quickly. We need to do it in a slower and smarter fashion (*Chemical and Engineering News*, 1993a: 9).

Then what strategies should smaller firms adopt in relation to Responsible Care? Such firms may implement Responsible Care incrementally, probably one Code at a time. Further, they can tap into systems developed by the CMA for disseminating information on Responsible Care. The CMA has created a database that identifies firms (and their managers) having expertise in certain Responsible Care Codes and that are willing to share information. The CMA is also encouraging regional networking of firms. It has divided firms into 36 geographic regions where they can form local circles and jointly undertake activities such

¹²³ Many consider bureaucracies as being necessary for coordinating activities of functionally differentiated organizations. Bureaucracies are characterized by formal procedures and documentation of management systems. Smaller firms, in contrast, have more "oral traditions" with fewer written rules and procedures.

¹²⁴ Creating such documentation is problematic for older facilities where such systems do not exist. However, innovative firms like Indianapolis-based Reilly Industries are employing engineering students for creating such documentation. This is a win-win situation; Reilly benefits since it is able to employ skilled personnel at a low cost; students benefit since they get hands-on practical experience (*Chemical and Engineering News*, 1993a).

as community outreach or emergency planning. Consequently, firms can share costs and pool together their talents for delivering higher quality programs. Networking has other advantages as well. Smaller firms may hesitate to seek help from their customers (often larger firms) since they do not want to display their vulnerabilities. Networking is therefore a non-threatening way of sharing experience among smaller firms.

However, firms may avoid sharing information for competitive reasons. Lawrence J. Rosen, Chief Executive Officer of Pittsburgh-based Pressure Chemicals notes that:

If a company helps me to reduce my pollution and waste it also helps cut my costs and that makes me more of a competitive threat [However] It's in their [that is, larger firms'] own best interest to help us comply with Responsible Care, because if the smaller companies mess up, it dirties the image of the entire industry and that's something we just can't afford (*Chemical and Engineering News*, 1993a: 14).

Responsible Care could be viewed as an asset-specific investment by larger firms that is subjected to 'opportunism' (Williamson, 1975, 1985) by smaller firms. Let me elaborate. Responsible Care creates goodwill for the chemical industry, especially for the larger and more visible firms, among regulators and other stakeholders. Once such firms have invested in Responsible Care, they have incentives for preserving its image and encouraging its widespread adoption. As a result, they have to make side-payments (offers of technical help and sharing information) to create incentives for the smaller firms for adopting Responsible Care. However, larger firms also face a collective action dilemma: they all want to appropriate goodwill benefits emanating from Responsible Care without contributing to side-payments. To overcome this collective action dilemma, the CMA employs peer-pressure (by publicizing

such efforts) to create incentives for managers in larger firms to help smaller firms.

Smaller firms are often vendors to larger firms. Once Responsible Care becomes a *de facto* requirement for being a vendor, smaller firms have sufficient incentives to adopt it. This can be interpreted as early-adopters (larger firms) choosing standards with which they are comfortable. In the case of Responsible Care, the larger firms are comfortable with standards requiring detailed documentation. Once a critical user-base develops (that is, most large firms in the industry opt for Responsible Care), and these users mandate that their vendors should also adopt Responsible Care, then smaller firms have little choice. Note that the smaller firms have a comparative disadvantage vis-a-vis larger firms in implementing documentation-intensive standards.¹²⁵ We thus see interesting dynamics where one set of factors increases the bargaining power of early-adopters (larger firms) and the other set of factors (opportunistic exploitation) increases the bargaining power of late-adopters (smaller firms).

In his “State of the Industry” remarks at the 46th annual Chemical Industry Conference, J. Lawrence Wilson, Chairman and Chief Executive Officer of Rohm and Haas Company, noted that “Responsible Care has taught us how to have a meaningful dialogue with the people who live outside our plant gates The faceless chemical industry has begun to take on human dimensions” (CMA, 1996b: 10). However, critics are skeptical of the impact of Responsible Care on the culture and functioning of the chemical industry. They view such initiatives as mere attempts by industry to preempt stringent legislations

¹²⁵ One can also argue that if late-adopters (smaller firms) want to tap into network externalities (due to membership in the club of certified vendors), then they have to adopt standards dictated by early-adopters (Katz and Shapiro, 1983).

(Chatterjee and Finger, 1994). Fred Miller of Friends of Earth views Responsible Care as “the velvet glove around the iron fist ... industry has a heavy burden of proof to show that it is just not a PR gimmick.” (*Chemical and Engineering News*, 1992b: 39). Further, many dispute the extent of change in the culture and practices of chemical industry, and the speed with which they have been accomplished. Press L. Robinson, member of CMA's Public Advisory Panel notes that:

The chemical industry didn't get into this mess overnight, and it won't get out of it overnight ... you don't take a \$280 billion industry and change it overnight (*Chemical and Engineering News*, 1992b: 39).

There are two substantive criticisms of Responsible Care: the use of self-evaluation by firms for assessing their progress on implementing Responsible Care and the role of community advisory panels (CAPs) in guiding Responsible Care's implementation at the facility level.¹²⁶ Let me first elaborate on the criticisms of self-evaluation. Responsible Care generates many benefits for the chemical industry, particularly goodwill with the regulators and the various publics. Since goodwill benefits are non-excludable, individual firms have few incentives for contributing to its provision. To minimize free-riding, the CMA *mandates*

¹²⁶ There are other criticisms as well. For example, the CMA has a slogan: “track us, don't trust us.” Thus the CMA seems to be challenging environmental groups to assess its initiatives on performance and not on preconceived notions on chemical industry. Some environmental groups did take up this challenge. Responsible Care requires that firms should share information on their environmental, health and safety policies. Individuals can call facilities for such information and the facilities' Responsible Care contacts are expected to return these calls within a week. The Public Interest Research Group (PIRG) called 192 facilities in 28 states to ask nine questions on their health, safety, and environmental policies. Only 17 percent of facilities answered all the nine questions. *Mother Jones* magazine also undertook a similar exercise and got disappointing results. Though the CMA identified flaws in the methodologies adopted by PIRG and *Mother Jones*, it undertook a modified version of this exercise and found that facilities were not prompt in sharing information (*Chemical and Engineering News*, 1992b).

that its members adopt Responsible Care thereby transforming goodwill benefits into a club good. However, the CMA has not set up any monitoring mechanisms for ensuring that its members implement this program; it relies primarily on self-evaluation by firms.¹²⁷

Further, since the membership to the CMA is voluntary, a threat of expulsion for not implementing Responsible Care is not credible. This is also tacitly accepted by Jon Holzman, CMA's Vice-President for Communication who maintains that the CMA does not intend to expel members for not implementing Responsible Care. Rather, CMA's strategy is to encourage and equip members to implement it. According to Holzman, the CMA follows a three step process for monitoring progress on Responsible Care and correcting unsatisfactory performance. First, the CMA talks directly to the facility managers (since progress is monitored at the facility level) and gives them deadlines for correcting implementation shortfalls. If this fails, then the CMA contacts senior managers at the firm's headquarters and encourages them to pressure their facility managers to improve performance on Responsible Care. If this does not succeed, then conceivably a firm may lose its CMA membership (*Chemical and Engineering News*, 1992b).

Under Responsible Care, firms have established more than 315 CAPs throughout the U.S. (CMA, 12). Critics argue that CAPs are inadequate for guiding facility-level Responsible Care policies. CAPs may lack credibility because of conflict of interest: they are set up by firms that they seek to informally regulate. A bias in selecting CAP members may operate both at the firm and member levels. Firms may appoint only the most pliable

¹²⁷ Progress on Responsible Care is measured by other parameters as well. For the Pollution-Prevention Code, the performance is measured by the Toxic Release Inventory Data (Chapter 5). For the Distribution Code, firms are expected to use Department of Transportation's framework for assessing their performance.

members of public to the CAPs. Members of the public may also have few incentives to serve on CAPs.¹²⁸ CAPs are expected to encourage policies that lead to safer industrial practices and a cleaner environment. However, since the benefits of such policies are non-excludable, members of the public have incentives to free-ride.¹²⁹ Further, actors who agree to serve on CAPs may not have the expertise to analyze complex technical information.¹³⁰ Even if CAP members do have this expertise, firms are not obliged to share information with them, especially if such information reflects firms in a bad light.

In light of the above criticisms, it was suggested that the CMA should mandate that its member firms have external audits of their Responsible Care programs. This suggestion has been opposed by some CMA members who feel that CAPs serve the purpose of external verification. They believe that the public will see evidence of improvement in ways such as reduced emissions, less disposed waste, and fewer transportation accidents. Further, some maintain that:

[O]ne of the best ways of convincing the public is through citizen advisory panels (CAPs). There is no need for independent audits If the chemical industry satisfies the communities in which we operate, then the public at

¹²⁸ Though environmentalists may want to serve on CAPs.

¹²⁹ Two interesting research issues are: (1) what are the backgrounds and motivations of members that serve on CAPs? Are there any cross-sectional and longitudinal variations?; and (2) Are all CAPs equally credible with facility managers? Does their credibility with firms and their effectiveness in influencing firms' policies vary with the credentials of their members?

¹³⁰ To extend this argument, it is important that CAP members have technical skills. However, technically skilled members of public may have substantial professional commitments that leave little time for them to serve on CAPs. As a result, the members that may agree to serve on CAPs may have the least technical expertise and the most "surplus" time. Thus, the institutional design of CAPs itself may result in erosion of their effectiveness and credibility.

large should be satisfied (*Chemical and Engineering News*, 1992b: 20).

In spite of objections by some member firms, in 1996, the CMA introduced a pilot external audit program called the Management Systems Verification (MSV) (CMA, 1996b).

Puzzle

CMA is an association of chemical firms. Given the nature of its product portfolio, Baxter virtually has no involvement with the CMA, and consequently with Responsible Care.¹³¹ In contrast, Lilly is an active CMA member. John Wilkins of Lilly's Corporate Environmental Affairs chairs CMA's Indiana-Ohio-Kentucky chapter of Responsible Care. Hence, I will focus only on Lilly's response to Responsible Care.

Though the CMA requires that its members adopt Responsible Care, firms have considerable autonomy in deciding the extent and the pace of its implementation. For example, a firm may implement some, and not all, Codes of Conduct. Further, it may only sequentially, and not parallelly, implement these codes. The puzzle is: why did Eli Lilly initially hesitate to implement some Codes of Responsible Care, and then enthusiastically

¹³¹ Since only 1 out of Baxter's 200 facilities was involved in the manufacturing of chemicals, Baxter has maintained only a nominal presence in the CMA.

If the CMA is a powerful body capable of influencing key legislations, then why did Baxter not attempt to have a more forceful presence in it? Again, since Baxter's business interests are very different from that of other CMA members, Baxter has little opportunities for utilizing the CMA to further its firm-specific objectives.

To reemphasize, the objective of this dissertation is to understand why firms adopt beyond-compliance policies. To explore this puzzle, I am examining five sets of beyond-policies each in Baxter and Lilly, four of which are common to both and one each is idiosyncratic to each firm. Responsible Care is idiosyncratic to Lilly.

implement all of them?

Predictions Based on Theories of Firms

Efficiency-based theories suggest that Lilly would have implemented Responsible Care only if the program met or exceeded the criteria of investment appraisal procedures. Since the supporters of Responsible Care did not (and could not) make a business case for implementing it, efficiency-based explanations suggest that Lilly would not have implemented Responsible Care, even though it would have officially adopted it.¹³²

If policies are not implemented by the efficiency-based route, then they may be implemented through power- or leadership-based processes. Power-based explanations predict that Lilly would have implemented Responsible Care only if policy-supporters “captured” the top-management and had it overrule the skeptics. Consequently, we should expect little organizational consensus on this policy. Alternatively, these explanations suggest that structurally powerful individuals could prevent implementation of all Codes of Responsible Care.

Leadership-based explanations suggest that policy-supporters may have succeeded in generating consensus by convincing skeptics that implementing *all Codes* of Responsible Care served Lilly's long-term interests, even though it may not generate quantifiable profits. They would have highlighted that aggressive and visible implementation of Responsible

¹³² Since in other cases analyzed in this dissertation the adopted policies were also implemented, I focus only on adoption of policies. Responsible Care is different in that firms may adopt it but may not implement it.

Care would increase Lilly's credibility within the CMA, and with the regulators, environmental groups, and local communities. As a result Lilly would be better able to influence policy and legislative processes to serve its long-term interests.

Analysis

When the CMA proposed Responsible Care in 1988, Lilly was hesitant in adopting it. Or, if forced to adopt it, then early internal assessment suggested that they would not implement all of the Codes. In particular, some senior managers strongly objected to the Code on Community Awareness and Emergency Response that required developing community outreach programs. They argued that communities living in the vicinity of any facility often have little technical knowledge for appreciating how manufacturing processes work. Hence any sharing of technical information may lead such communities to make unwarranted conclusions about the safety aspects and environmental impacts of a facility's operations. As discussed previously, establishing community outreach programs and CAPs was opposed by many leaders in the chemical industry as well. As Simmons and Wynne observe:

Fundamental to the identity of the chemicals sector is its sense of being a science-based industry. This is deeply ingrained in the industry's culture and belief about the validity and authority of science frame its view of outside groups. These beliefs are reflected in the argument that has been made to legitimate then *industry's claim to self-regulation -- that its unmatched knowledge and expertise make the industry's own experts the people best suited to audit and regulate the environmental effects of its activities* (1993: 218; italics mine).

Thus, even though Lilly formally adopted Responsible Care, it kept a low key approach, especially on implementing the Code on Community Awareness and Emergency Response. In 1993, when a main opponent of Responsible Care retired,¹³³ the supporters of the program spotted a window of opportunity. They were in a better position to convince the remaining skeptics of the benefits of implementing Responsible Care. Particularly, policy supporters highlighted the tremendous benefits, even though non-quantifiable, of establishing community out-reach programs in terms of generating goodwill within the CMA and among local communities, regulators, environmental groups.

Let me elaborate on the benefits for Lilly for maintaining a high profile within the CMA. As I have discussed before, the CMA is a significant player in the debates on proposed laws and regulations or any controversy that impacts the chemical industry. Consider these two examples. Recently, the EPA has proposed to double the number of chemicals to be reported under the Toxic Release Inventory program (Chapter 5). The CMA has challenged this proposal in a federal court.¹³⁴ It appears that eventually the EPA, the CMA, and other parties will arrive at a compromise on the additions to the TRI list. Thus, firms having a crucial say in the running of the CMA will have better chances of influencing the eventual outcome in their favor. The second example pertains to CMA's response to the

¹³³ This actor was a very senior manager having critical influence in a major committee that decided on corporate environmental policies.

¹³⁴ The CMA argues that the proposed additions to the TRI list do not meet the objectives of the program (CMA: 1996b). As discussed previously, the objectives of the TRI program are to inform communities about toxic chemical releases and to track the reductions in such releases.

public debate generated by a recent book, *Our Stolen Future* (Colborn, 1996).¹³⁵ This book suggests that certain chemicals may disrupt the normal functioning of endocrine glands and lead to problems such as sterility. Consequently, many environmental groups have called for a ban on the use of such chemicals. Since evidence on this subject is inconclusive, the CMA has committed \$850,000 for further research into the causes of endocrine disruption.¹³⁶ Again, the main actors in the CMA will play a crucial role in shaping CMA's response to this controversy that has bearing on the future of the chemical industry.¹³⁷

The above discussion again suggests that individuals matter, not only for implementing particular programs, but also in opposing them. Structurally-advantaged individuals can ensure the implementation of unpopular policies or thwart the implementation of popular policies. Thus power-based processes can work both ways: in getting policies implemented and in having policies jettisoned.

Responsible Care supporters also developed innovative methods to control the costs of establishing community outreach programs. Eli Lilly established a network with other Indianapolis-based firms such as Reilly Industry, National Starch, and Dow Elanco having facilities in close physical proximity. These firms jointly undertake initiatives such as community outreach activities and conducting science demonstrations at local elementary

¹³⁵ The complete title of this book is *Our Stolen Future: Our We Threatening Our Fertility, Intelligence, and Survival?: A Scientific Detective Story*.

¹³⁶ Lilly has also established an internal group for analyzing this issue.

¹³⁷ Currently, the CMA is funding research in four areas: (1) developing processes for identifying potential endocrine modulators; (2) evaluating the adequacy of existing methods and developing valid screening assays; (3) developing a framework for analyzing potential risks of endocrine modulation in humans and non-humans; and (4) understanding how endocrine disruptions actually occur (CMA, 1996a).

schools. Thus these firms share costs as well as provide a superior program by pooling their talents (*Chemical and Engineering News*, 1993a).

An important task for the policy-supporters was to ensure wide-spread internal participation in developing and implementing Responsible Care. Specifically, there was a concern that Responsible Care should not be viewed as a corporate program over which facilities had little control. To meet this objective, a Responsible Care group was established with representatives from various facilities. This group meets once every two months to share experiences in implementing existing Responsible Care initiatives and developing new ones. Establishing this group has resulted in unprecedented enthusiasm among facility-level managers for implementing Responsible Care.

Lilly is now a show-piece of successful implementation of Responsible Care. As discussed before, a major criticism of Responsible Care is that it lacks external verification. In response to this criticism, the CMA is implementing pilot programs of Management System Verification (MSV) where external auditors assess a facility's progress on Responsible Care. Lilly is an industry leader in this aspect in that it has recently commissioned an MSV pilot for its Tippecanoe facility.

Lilly is implementing Responsible Care Codes in its following sites: Carolina (3 facilities), Puerto Rico, Clinton (Indiana), Indianapolis (Bulk, Pharmaceutical, and Chemical Process Development, Indiana), Mayaguez (Puerto Rico), and Tippecanoe (Indiana). Even though not required by the CMA, some of Lilly's foreign affiliates are also implementing their respective national versions of Responsible Care. These affiliates included Cosmopolis (Brazil), Kinsale (Ireland), and Speke (UK). As shown in Tables 6.3 and 6.4, Lilly evaluates

the facility-wise progress on all the six Codes of Responsible Care.

[Insert Tables 6.3 and 6.4 About Here]

The CMA recommends using a six-point scale for assessing progress on Responsible Care. Accordingly, Lilly employs the following interval scale:

- 1 = no action has been taken
- 2 = evaluating existing experience
- 3 = developing plans
- 4 = implementing plans
- 5 = plans have been implemented and are in place
- 6 = reassessing the existing plan

Lilly has set a goal that every facility should score at least 5.0 on each of the six Codes. Since facilities are audited more than once for assessing their progress on Responsible Care, Lilly reports the annual average score on all six Codes for every facility.

Some examples of policies reflecting the Six Codes of Conduct are given below:¹³⁸

Community Awareness and Emergency Response

I have already described how Lilly has teamed up with some Indianapolis-based firms for establishing community outreach programs. In addition, many Lilly facilities also undertake solo initiatives. For example, the Tippecanoe facility in Indiana has organized a

¹³⁸ This is based on Lilly (1994c).

community forum for discussing its environmental, health and safety performance. This forum meets periodically, typically twice a year. This facility also conducts an annual emergency drill with the county's police, fire, and health services. As a result, the Tippecanoe facility has brought in more transparency in its decision-making processes and generated confidence among the local community about its ability to deal with industrial accidents.

Pollution Prevention

I have already discussed Lilly's pollution-prevention initiatives in my exposition on the Toxic Release Inventory and the 33/50 program (Chapter 5). To recap, Lilly has initiated many policies that seek to minimize the use of solvents in the manufacturing process, and modify inputs or manufacturing processes for reducing emissions of toxic chemicals such as methylene chloride.

Process Stewardship

This again has been discussed in the case on Toxic Release Inventory and 33/50 program. Product stewardship means that firms will design products and processes that minimize negative impact on the environment and on the health and safety of their employees and of local communities in which the facilities are located. Lilly has a well-established management system (New Product Environmental Review Tracking Process) to assist product development teams in anticipating environmental issues emanating from manufacturing and/or consumption of new products. Thus, proactive measures are possible

for modifying products to take care of such concerns.¹³⁹

Health and Safety

Lilly has taken two specific measures for meeting its health and safety objectives. First, it has established a strong network of safety professionals and industrial hygienists at its various facilities and laboratories. Second, it conducts regular in-house safety audits for evaluating the implementation of its health and safety policies.

Distribution

Previously, I have described how Lilly networked with other Indianapolis-based firms to establish community outreach programs. Lilly, together with these firms, has also established a logistics system for chemical shipments. For example, in the early 1990s, the state of Indiana did not have the necessary statistics for planning shipping operations. These firms, together with their transporters and city/state officials, created a task force for gathering such statistics. This enabled these firms, including Lilly, to schedule shipments in a cost-effective manner.

In addition, Lilly has developed a computer-aided logistics system that enables its traffic managers to route shipments through the safest routes. It also closely scrutinizes the safety records and policies of its transport carriers. Further, it has an emergency action plan

¹³⁹ Product-life-cycle (PLC) is a useful tool for assessing the environmental impact of products. However, Lilly does not employ this tool. The reason is that PLC is useful only when products are bulky or get assimilated back into the environment with difficulty. Since products manufactured and marketed by Lilly are physically small and they are ingested into the human system (and not disposed off in a landfill), PLC is a less useful tool for assessing their environmental impact.

in case an accident should occur.

Process Safety

Lilly has a permanent staff that continually reviews both existing and new manufacturing systems to identify potential safety hazards.

To conclude, power-based processes explain Lilly's initial hesitation in implementing all Codes of Responsible Care. Leadership-based processes explain why Lilly successfully implemented all Codes of Responsible Care, even though the benefits of such policies were not quantifiable. Once the key opponent of Responsible Care retired from Lilly and was not in a position to influence its environmental policymaking, policy supporters succeeded in generating consensus especially on implementing community outreach programs. They convinced the skeptics that adopting all Codes of Responsible Care would serve Lilly's long-term interests, even though such policies may not generate quantifiable profits. They highlighted that aggressive and visible adoption of Responsible Care would increase Lilly's credibility within the CMA, and with the regulators, environmental groups, and local communities. Credibility within the CMA was particularly important, given CMA's preeminent position as the representative of the chemical industry in most of environmental policy debates..

Policy-supporters won the trust of skeptics by innovating strategies for controlling costs and enhancing the quality of many Responsible Care initiatives. Lilly joined hands with Indianapolis-based firms for developing community outreach programs and establishing a

database for transportation logistics. Program supporters also set up active internal structures for discussing implementation issues. Further, by employing a well-defined six point scale, they clearly communicated corporate expectations to the facility managers about progress on the various Codes of Responsible Care. Finally, by establishing a system of regular internal audits, facilities could have specific and timely feedback on their progress in implementing all the six Codes of Responsible Care.

Table 6.1
Major Industrial Accidents in the 1970s-1990s

United States

- 1985 Institute, Virginia
135 injured due to methylene chloride leak at a Union Carbide's facility
- 1988 Henderson, Nevada
2 dead due to Ammonium perchlorate explosion at Pepcon's facility
- 1989 Pasadena, Texas
23 dead due to ethylene and isbutane explosion at Philip 66's facility
- 1990 Channelview, Texas
17 dead due to wastewater plant explosion at Arco's facility
- 1991 Charleston, South Carolina
6 dead due to explosion at Albright and Wilson America's facility
- 1991 Sterlington, Louisiana
8 Dead due to explosion at IMC's facility

Abroad

- 1974 Flixborough, England
28 dead due to release of cyclohexane vapors at Nypro's facility
- 1976 Seveso, Italy
Thousands affected by dioxin release at Hoofmann-LaRoche's facility
- 1984 Cubatao, Brazil
508 dead due to a fire caused by a gasoline leak
- 1984 Bhopal India
2000 dead due to a methyl isocyanide leak from Union Carbide's facility
- 1987 Ros Al Juaymah, Saudi Arabia
22 dead due to an explosion at a natural gas complex

Source: Adapted from *Chemical and Engineering News* (1993b: 14).

Table 6.2
Injury Rates (# of Injuries per 100 employees) and Firm Size

# of Employees	1-19	20-49	50-99	100-249	250-499	500-999	1000-2499	>2500
Year								
1986	6.3	9.5	11.1	8.4	6.6	5.1	3.5	3.1
1987	5.8	9.8	2.2	9.0	6.5	5.7	4.1	3.9
1988	8.1	11.5	11.5	8.3	6.6	5.5	3.7	4.1
1989	6.7	11.4	11.2	8.5	6.9	6.1	3.5	3.7
1990	5.0	11.7	10.6	8.0	6.2	4.9	3.3	3.5
1991	6.9	10.1	9.4	8.2	5.1	5.6	3.5	3.2

Source: *Chemical and Engineering News* (1993b: 34)

Table 6.3
Lilly's Internal Evaluation of Responsible Care

Scale:

- 1 = No action has been taken
- 2 = Evaluating existing experience
- 3 = Developing plans
- 4 = Implementing plans
- 5 = Plans have been implemented and are in place
- 6 = Reassessing the existing plan

	1992	1993	1995*
Community Awareness	3.7	3.7	4.5
Emergency Response	4.5	4.5	4.7
Pollution Prevention	3.6	3.7	4.4
Process Safety	3.6	4.0	4.0
Distribution	2.7	3.3	n.a
Health & Safety	4.3	4.7	4.5
Product Stewardship	2.0	4.4	n.a

* These scores represent the mean of scores of six Responsible Care Facilities

Source: Adapted from Lilly's *Environmental Performance Reports 1992b and 1995c*

Table 6.4
Responsible Care: Implementation Status

Scale:

- 1 = No action has been taken
- 2 = Evaluating existing experience
- 3 = Developing plans
- 4 = Implementing plans
- 5 = Plans have been implemented and are in place
- 6 = Reassessing the existing plan

<i>Site</i>	<i>1995 Average*</i>	<i>1991 Average*</i>	<i>Percent of Practices in Place in 1995</i>
Carolina	4.1	2.7	28
Clinton	5.0	3.3	73
Indianapolis	4.7	2.7	61
Mayaguez	4.7	2.7	62
Tippecanoe	5.1	3.3	66
Total	4.7	2.9	58

* Since Lilly conducts multiple audits every year, average of all audits scores is being reported.

Source: Wilkins (1996)

Chapter 7 ISO 14000

Background

International Organization for Standardization, a Geneva-based non-governmental organization founded in 1946, promotes the development and implementation of voluntary international standards.¹⁴⁰ Currently, this organization is developing a series of environmental management systems standards -- ISO 14000 -- for manufacturing as well as service organizations.

ISO 14000 attempts to replicate the success of ISO 9000 quality control and quality assurance standards in environmental management. ISO 9000 standards were introduced in 1987. They are a series of system standards; not product standards. Product standards can be checked in a laboratory; system standards can only be verified by an auditor. ISO 9000 standards outline principles and requirements for managing value-addition processes with a focus on meeting customers' expectations. Instead of "buyer beware," firms take up the onus of demonstrating that the product is of high quality.¹⁴¹ The ideas embedded in ISO 9000

¹⁴⁰ These standards are currently being debated by delegations from 44 countries. These delegations consist of representatives from industry, national standard organizations, and environmental groups. A technical committee -- ISO/TC 207 -- was commissioned in 1993 to develop these standards (Cascio, 1994).

¹⁴¹ What is quality? According to Margaret Thatcher, former Prime Minister of Britain, "quality is about making products that don't come back for customers that do" (cited in Johnson, 1994: 15). Kume notes that:

The original starting point for quality control was production and inspection. At that stage, the criterion for quality was that the product met a standard. In other words, quality was defined as *conformance to standards*. However, this notion of quality forms only a small part of the modern concept ... the general criteria for judging the quality of products and services is not an artificial standard but whether or not it actually satisfies customer requirements. In other words, quality is now defined as *conformance to*

are not new or radical. They share commonalities with Deming's 14 Points, Total Quality Management, and Malcolm Baldrige National Quality Award criteria.¹⁴²

Since World War II documented quality standards have existed in the United States. The most comprehensive military standard (MIL-Q-9858) was adopted in 1959 by the US Department of Defense. In the last two decades, the Big 3 automakers (General Motors, Ford, and Chrysler) have also established quality standards for their vendors and audit their vendors' facilities (Johnson, 1993). Before quality standards emerged as an established industrial practice, vendors to multiple customers often had to adhere to multiple, and sometimes contradictory, standards for the same component. Thus, vendors began demanding uniform quality standards and single rather than multiple dyadic audits.¹⁴³

ISO 9000 was an outcome of such circumstances. In Europe, the push for ISO 9000 has come mainly from national governments. In the United States, private corporations and military suppliers have been the most visible supporters of such standards. The American ISO 9000 variant (Q90) has been developed by an industry group, The American Society for Quality Control, in collaboration with the American National Standards Institute (Johnson, 1993).

The ISO 9000 standards have the following elements:

- (1) The management outlines its plan for operationalizing “process quality” and

requirements (1995: 6; italics mine).

¹⁴² W. Edward Deming is a leading authority on Total Quality Management. His important works include Deming (1980, 1986, 1992)

¹⁴³ Dyadic audits means that for every transaction, the buyer and the seller need to establish the quality of the product.

communicates it to stakeholders within and outside the organization. Importantly, the management also identifies resources for achieving these objectives.

- (2) There is an explicit long-term strategic plan on how these objectives are going to be met. This ensures that pursuing these objectives is not reduced to a short-term tactical exercise, but gets ingrained in the long-term plans of the organization.
- (3) Employee empowerment and demonstrated management support for their training and development are important elements of any ISO 9000 system. Quality control, by its very nature, cannot be a top-down process. This has a Hayekian flavor since it is explicitly recognized that knowledge is decentralized (Hayek, 1945) and employees at the shop-floor are often in the best position to identify improvement areas and to undertake the improvements.
- (4) ISO 9000 requires close monitoring of all inputs to the production process -- a philosophy of prevention rather than detection and rectification. This involves close control over the quality of inputs as well as commitment to developing suppliers. The traditional dichotomy of arms-length relations between firms and suppliers needs a reassessment. Implementing ISO 9000 involves long-term mutually supportive relational-contracting (Goldberg, 1980). Firms focus on developing productive relationships with their suppliers; they are not obsessed with creating safeguards against suppliers' opportunism (Williamson, 1985).
- (5) Value-addition processes need to be monitored and carefully documented. Regular management system audits are necessary to ensure that value-addition processes meet their stated objectives.
- (6) ISO 9000 certification involves auditing by an accredited third party. Auditors review documents on control processes and conduct semi-annual on-site reviews.¹⁴⁴ Third-party certification imparts credibility to the efforts of ISO 9000 certified firms and transforms benefits of customer goodwill into

¹⁴⁴ ISO 9000 certification is done at a facility level; not at the firm level. Hence within a given firm, only some of the facilities may be ISO 9000 certified. A facility may get certified to one of the three models in the ISO 9000 series (ISO 9001, 9002, or 9003) depending on the scope of its operations. ISO 9001 is most comprehensive covering facilities whose processes include design and development, production, and servicing. ISO 9002's scope is limited in that it excludes facilities that undertake design and development of products. ISO 9003 is most limited in its scope. It is applicable to facilities that perform final tests and inspection functions only (Johnson, 1994).

excludable products since customers are able to identify such firms.¹⁴⁵

- (7) Critically, ISO 9000 systems require that there be a constant flow of information from the customers to the sellers on product performance and opportunities for product improvement. Therefore, organizations need to establish mechanisms for receiving and responding to customer feedback.

As shown in Table 7.1, ISO 9000 has been enthusiastically adopted all over the world. By March 1995, about 95,000 facilities had received the ISO 9000 certification. As shown in Table 7.2, many countries have adopted their national versions of ISO 9000; often by superficially changing the wording of ISO 9000 and giving it a national label.

[Insert Tables 7.1 and 7.2 about here]

ISO 14000 is an attempt to extend the ISO 9000 principles to environmental management systems. Fredericks and McCallum observe that:

ISO 9000 is aimed at meeting customer requirements, control of processes and continuous improvement. ISO 14000 is aimed at these, and more: 'customer requirement' has expanded to include regulatory and other mandatory environmental requirements;¹⁴⁶ and 'continuous improvement' is not only driven by customer expectations but also by priorities and objectives

¹⁴⁵ This discussion can be linked to the analytical separation between production and provision of products (See Chapter 2; Ostrom V. and E. Ostrom, 1977). Dyadic certification involves provision and production of certification services occurring at the level of a dyad -- the buyer and the seller. Often, the buyer has to produce as well as provide the certifications services. Third-party certification, in contrast, implies that certification services are produced by a specialized actor -- the third-party certifier, and provided by one of the dyadic actors. Thus, at the aggregate level, the costs of third-party certification are less than the total costs of dyadic certification.

¹⁴⁶ This also implies that unlike quality issues, environmental issues are not two-party contractual issues.

generated internally by the organization (1995: 1).

ISO 14000 does not replace ISO 9000. Nor does it replace industrial codes of practices such as Chemical Manufacturers Association's Responsible Care (Chapter 6) and International Chamber of Commerce's Business Charter for Sustainable Development. Importantly, ISO 14000 also does not replace local laws and regulations; such legal obligations are treated as minimum requirements for designing ISO 14000 systems. As shown in Table 7.3, the ISO 14000 series consists of one compliance standard (mandatory) -- ISO 14001, and several guidelines standards (non-mandatory). The ISO 14001 may be viewed as the foundation of the entire series. Any facility seeking ISO 14000 certification is required to demonstrate that its environmental management systems meet the criteria specified in ISO 14001. In contrast, other ISO 14000 standards are only guidelines and do not require certification.

[Insert Table 7.3 About Here]

Puzzle

Baxter and Lilly have adopted a wait-and-see policy on ISO 14000. They are not taking a lead by becoming early-adopters. This is puzzling since: (1) both of these firms have ISO 9001 certification and therefore have experience with implementing management systems and with third-party certification; (2) they already have well-established environmental management systems that could be modified to meet ISO 14000 standards;

and (3) economic globalization and expansion outside the U.S. is important to their respective corporate agendas and ISO 14000 can remove a potential hurdle to tap foreign, especially European markets. The resistance to adopting ISO 14000 is especially puzzling with respect to Baxter since it is committed to having a state-of-the-art environmental program.

Predictions of Theories of Firms

Efficiency-based explanations suggest that firms will adopt only those projects that meet or exceed the criteria of investment appraisal procedures. If policies are not adopted by the efficiency-based route, then they may be adopted through power-based or leadership-based processes. Power-based explanations predict that firms would adopt ISO 14000 only if policy-supporters can “capture” the top-management, and have it overrule objections of policy-skeptics. Consequently, we should expect little organizational consensus on this policy. Leadership-based explanations suggest that policy-supporters succeed in generating consensus over these policies by convincing skeptics that adopting ISO 14000 serves long-term interests of their firms, even though its profit impact may not be quantifiable. These leaders may highlight that since ISO 14000 may become mandatory for exports to the European Community, their firms need to proactively have the ISO 14000 certification. Further, they may highlight that adopting such standards will increase the credibility of their firms' environmental programs with regulators, and stakeholders such as environmental groups and local communities.

Since supporters of ISO 14000 in both Lilly and Baxter could not make a business

case for adopting it, efficiency-based explanations suggest that these firms will not adopt ISO 14000. Baxter and Lilly's policies are thus consistent with the predictions of efficiency-based theories. The puzzle then is: why these firms that are committed to going beyond-compliance, and in the past, have committed millions of dollars to Type 2 policies, did not adopt ISO 14000?

Analysis

What are the costs and benefits to an individual firm for adopting ISO 14000 standards? Firms face three kinds of costs. First, firms bear the costs of creating, adopting, and implementing new management systems. Further, the ISO 14000 systems require extensive documentation and many firms may not have the resources for doing so. Second, firms bear the costs of third-party certification. These costs were significant: typically around \$20,000 per facility.¹⁴⁷ Thus, for a firm such as Baxter that had over 200 facilities,¹⁴⁸ third-party certification may cost up to \$4 million.¹⁴⁹ Third, firms that invest significantly in research and development are apprehensive of giving outsiders (that is, the third-party certifiers or auditors) access to confidential information. Consequently, to guard against

¹⁴⁷ To rein in certification costs, many firms are evaluating whether they can combine ISO 9000 and ISO 14000 audits. Since there is also a move to develop ISO 20000 standards for health and safety systems, some auditing firms are exploring whether ISO 9000 and 14000 audits can be combined with health and safety audits (*Chemical Week*, 1995: 65).

¹⁴⁸ As discussed in Chapter 3, effective October 1, 1996, Baxter has reorganized itself in two corporations: Baxter International and Allegiance Corporations. Since I am focussing on environmental policymaking during mid 1975 to mid 1996, Baxter's reorganization does not affect my research design. However, the impending reorganization did impact internal policy dynamics and I discuss this later in this chapter.

¹⁴⁹ To reemphasize, certification is done at the facility level; not at the firm level.

industrial espionage, such firms will need to expend resources for establishing internal protocols on information disclosure.

Further, certain critical issues on the roles and responsibilities of third-party certifiers remain unresolved. First, will the findings of such certifiers be made public? If so, then how? Second, are the certifiers required to report instances of environmental violations to the appropriate regulatory authorities? If so, then does this create disincentives for managers to share compliance information with certifiers? This is important since under many laws, civil and criminal charges can be brought against individual managers for non-compliance with environmental laws. Third, the findings of these certifiers may not be protected by the attorney-client privilege.¹⁵⁰ As would be discussed in Chapter 8 (Environmental Audits), even though some state level regulatory agencies grant attorney-client privilege to environmental audits, the EPA does not. This creates disincentives for U.S.-based firms to invite external certifiers to audit their environmental programs.

Adopting ISO 14000 standards also creates benefits for firms. Some scholars consider ISO 14000 a key policy response by business firms to environmental issues. Puri notes that:

Traditionally, organizations have been operating in a reactive mode, i.e., identifying the environmental aspects of activities and their impacts on the environment, and establishing an environmental management system to control those activities. Environmental compliance and proactive environmental considerations in activities such as the design function have

¹⁵⁰ This means that the information provided by clients to their attorneys cannot be used as evidence against clients. Does this imply that the attorney-client concerns are important for compliance audits (whether or not a firm is complying with laws and regulations) only, and not for systems audits such as ISO 14000 (whether or not management systems are in place)? This is not true since compliance issues often crop up during systems audits. Hence, attorney-client privilege issues do impact firms' assessment of ISO 14000.

rarely been considered. However, it is now recognized that the designers are the ones who really understand the origins of products ... instead of piecemeal crisis-oriented response to environmental issues, the organizations can incorporate all requisite design aspects into the system (1996: 21-22).

Firms as a group receive two categories of benefits. First, ISO 14000 replaces multiple environmental standards with a single standard. By increasing transaction costs, multiple standards act as non-trade barriers to international trade. In recent years many national and regional environmental standards such as the U.K.'s British Standard 7750, Canadian Standards Association's CS AZ750-94, and the European Community's Eco-label and Eco-Management and Audit Standards have been proposed. Since these standards have not been fully harmonized, they impede trade. By superseding these standards, ISO 14000 will reduce trade barriers. Note that a similar debate took place in the United States on ISO 9000. Since the European Community had adopted ISO 9000 (and called it EN 29000), it was feared that this may serve as a non-trade barrier for US exporters. Therefore, US firms wanting access to European markets have incentives to get the ISO 9000 certification.

Second, ISO 14000 standards preempt industry-unfriendly standards made by bureaucrats and reduce the scope of industry-hostile monitoring and enforcement by regulatory agencies and environmental groups.¹⁵¹ Many firms view some of the government-sponsored standards as being inefficient and 'industry-unfriendly' (Cascio, 1994; International Organization for Standardization, 1995a, 1995b). This is because such

¹⁵¹ The adversarial relationship between business and government in the United States, especially on environmental issues, is well documented (Chandler, 1980; Marcus, 1984; Vogel, 1986, 1995). Interestingly, this "adversary economy" co-exists with numerous instances of "capture" (Stigler, 1971) of the governmental instrumentalities by business firms (Kolko, 1963; Bernstein, 1965).

standards are written by bureaucrats who often seek to demonstrate to their constituencies (politicians as well as environmental groups) that they are being “tough with polluters.” Many managers believe that firms could deliver comparable levels of environmental performance at a lower cost if they were themselves to write such standards (Vogel, 1986). ISO 14000 provides opportunities for firms to participate in the writing of efficient and easy-to-implement environmental standards.

Further, the ISO 14000 certification process provides credible third-party certification of a firm's environmental management systems. Many managers perceive that certifiers often have a problem-solving attitude. Contrast this with the managerial perceptions of the attitudes of state and federal environmental regulators. For example, inspectors of environmental regulatory agencies are specifically prohibited from giving constructive feedback or from giving written comments to firms on the positive aspects of their environmental programs.¹⁵² Firms may have incentives for subscribing to ISO 14000 since environmental audits by credible third-parties may reduce public demand for more and stricter enforcement by government agencies.

Similarly, ISO 14000 may reduce public demand for new and more stringent environmental regulations. Particularly, a widespread acceptance of ISO 14000 may mollify demands of some environmentalists for uniform process standards, which are currently disallowed by the World Trade Organization (formerly, the General Agreement on Tariff and Trade).

¹⁵² This has been repeatedly pointed out during my interaction with many firms.

Although significant benefits may accrue to firms as a group, individual firms may have incentives to free-ride and not invest in adopting ISO 14000 standards. The issue then is whether the institutional design of ISO 14000 creates sufficient net excludable benefits for firms to adopt ISO 14000. Further, are these benefits quantifiable, enabling this project to meet the criteria of formal project assessment procedures? The excludable benefits are the following:

- (1) Firms with ISO 14000 certification will adhere to and register for only one standard and not multiple national standards (Cascio, 1993). This will reduce the transactions costs of multiple certifications and enable firms to tap economies of scale.
- (2) The European community may require firms to get ISO 14000 certification to qualify for governmental purchases (Johnson, 1994). Hence ISO 14000 certification provides excludable and monetizable benefits for firms with a business presence in Europe. However, for firms catering predominantly to non-European markets, ISO 14000 will bring little excludable and monetizable benefits.
- (3) Similarly, some firms may demand that their vendors get the ISO 14000 certification. For such vendors, ISO 14000 will bring excludable and monetizable benefits.¹⁵³
- (4) Consumers may demand that firms have ISO 14000 certification. However, as discussed in Chapters 2 and 10, there is a collective action dilemma at the consumer level in that some “green-consumers” may want the benefits of environmental sustainability without paying for it. Since the gains of environmental sustainability are non-excludable, such green-consumers may choose to free-ride, and the consequent large scale defections may not create sufficient incentives for firms get the ISO 14000 certification.

¹⁵³ Previously, I have discussed that the Big 3 automobile firms require that their vendors have documented quality control systems. This created sufficient incentives for the US automobile component manufacturers to get the ISO 9001 certification. This discussion also suggests that firms that significantly out-source their components can create “environmental multipliers” by requiring their vendors to have the ISO 14000 certification. On the other hand, vertically integrated firms will be less susceptible to such pressures.

- (5) Firms may have opportunities for reducing costs by improving environmental performance. In particular, firms may lower their insurance costs and have easier and cheaper access to credits and loans by documenting sound environmental practices (Schmidheiny and Zorraquin, 1996).
- (6) Having ISO 14000 certification demonstrates the intent of a firm to follow environmental laws and regulations in a systematic manner. Environmental regulatory agencies may therefore take a less harsh view of minor violations by firms that have such well-established environmental management systems.
- (7) Having ISO 14000 certification may also better prepare firms for implementing future environmental laws and regulations.
- (8) ISO 14000 may also better equip firms for participating in law-making processes. Often, regulatory agencies invite firms, citizen groups, and industry associations to comment on the proposed drafts of a new environmental law or regulation.¹⁵⁴ Since the inputs of firms with prior experience with environmental management systems will be more credible, such firms may have opportunities to leverage their expert knowledge acquired for shaping laws and regulations to their advantage.

Why have Lilly and Baxter adopted a wait-and-see attitude on ISO 14000?¹⁵⁵ Though

¹⁵⁴ For example, an internal document of Lilly reported that:

Further gains have been made in our efforts for a proactive involvement in legislative and regulatory issues at the federal and state level ... Lilly has been particularly active in ... the EPA's Clean Air Act Advisory Committee. We played a major role during 1992 in developing the proposed regulations for implementing Title V (Operating Permits) under the 1990 Clean Air Act.

At the state level, we have been a major player in the most significant emerging environmental legislations. The principal focus has been on enabling legislations for state implementation of the Clean Air Act. Other activities have centered on the subjects such as pollution prevention, the state's proposal for "good character" requirements for permit pursuance, rulemaking process, and adequate staffing of the state's environmental agency. Our regulatory focus has been on air rules dealing with interim construction permits and the definition of construction and modification. We continue to assist in the development of the "Voluntary Remediation Program" (1992b: 28).

¹⁵⁵ During the period of this study (mid 1975 to mid 1996) neither of these firms mandated that their facilities should adopt ISO 14000. Recently, some of Baxter's facilities have received ISO 14000 certification. As of July 29, 1997, 7 of its 120 facilities are ISO 14000 certified. Lilly's facility in Ireland is also scheduled to receive the ISO 14000 certification in 1997.

this policy is consistent with the predictions of efficiency-based explanations, one may ask why power-based dynamics did not work? Or why did some organizational-entrepreneurs not take a lead in convincing their firms that having ISO 14000 certification has long-term net benefits. I attribute their resistance to getting ISO 14000 certification to factors such as emergence of a “green-wall” (explained below), existence of well-functioning environmental management systems, attorney-client issues, and decline in external pressures on them to “go-green.”

There is an emerging literature that suggests that “green-walls” are emerging in firms that discourage managers from initiating Type 2 policies, beyond-compliance policies that not meet formal profit criteria. This green-wall is also manifested in reductions in headcounts and budgets of environmental departments and a reduced representation of senior managers on environmental committees. A recent article published in Arthur D. Little's influential management journal *Perspectives* notes that:

A close inspection of today's management of corporate environmental matters indicates that everything is not going smoothly. Although some companies are moving ahead with reliable strategic environmental initiatives, still others are backing away from the broad programs they adopted over the last decade. Why? Because they have hit the “Green Wall” -- they have reached that point at which management refuses to move forward with its strategic environmental program Early symptoms include ... deferred decisions because of reduced management support, and an inability to demonstrate return on investment in environmental programs (1995: 2).

Why has the so-called green-wall emerged only in the mid 1990s and not earlier? Further, if it has emerged, then how does it impact the adoption or non-adoption of ISO

14000? The green-wall has emerged due to following factors. First, environmental programs have tended to become victims of their own success. In the late 1970s and the 1980s, firms such as Baxter and Lilly invested significant resources in beyond-compliance environmental programs due to the perceived hostility of the regulators and pressures from stakeholders. Many cheerleaders, both within and outside firms, over-promised the benefits of such investments. Many environmental programs did not generate profits and this seemed to disappoint many managers. This is also a time when managers were under tremendous pressure to cut costs (see below). Therefore in the 1990s, many managers have begun closely scrutinizing environmental projects for their impact on profits.¹⁵⁶

Second, some environmental managers have adopted cultures that are out of sync with their firm's culture. As one of Baxter's managers put it, "we did not talk the language of business in term of profits and dollars." Riding on a "green-wave," environmental managers felt little need to communicate with managers in other functional areas. Thus the green-wall represents, in part, a backlash from non-environmental managers.¹⁵⁷

Factors external to firms have also contributed to the emergence of a green-wall. As evident in the initiatives of 104th U.S. Congress, there is a political backlash to the perceived

¹⁵⁶ Programs such as 3M's pollution-prevention-pays (3P) program have received considerable publicity. However, there is a burgeoning literature that questions whether all environmental initiatives are potentially profitable (Walley and Whitehead, 1994; Palmer et al., 1995).

¹⁵⁷ To tear down the green-wall, Arthur D. Little (1996) recommends that environmental leaders must transform environmental management into a business issue, employ traditional business terms that reflect their firms' priorities in communicating about environmental programs, and quantify benefits of environmental initiatives.

excesses of some of the existing environmental regulations.¹⁵⁸ The 104th U.S. Congress sought to dilute many environmental laws and cut the budget of the EPA. Thus, firms are feeling less pressured to gain external credibility by investing in beyond-compliance environmental programs.

The increased activity in the merger and acquisition markets in the 1990s and the perceived pressures of the emerging global economy have made most firms very cost conscious.¹⁵⁹ Further, an increased recourse to corporate downsizing for boosting corporate profits has often resulted in the axing of “softer” areas such as environmental management. This issue has been repeatedly emphasized by managers in Lilly and Baxter. Thus, environmental managers are increasingly being challenged to make a business case for their beyond-compliance programs. To emphasize, the green-wall does not encourage firms to violate environmental laws; it only impedes the adoption of beyond-compliance initiatives, especially ones that cannot be justified on established profit criteria (Type 2 policies).

The ISO 14000 initiative has been critically hurt by the emerging green-wall and external factors. First, it was initiated in an era (post 1993) when environmental programs are under attack both within and outside firms. Consequently, firms are feeling less pressured to undertake environmental symbolism through investing in visible beyond-compliance policies such as ISO 14000. As discussed in Chapter 10, external threats are often critical for

¹⁵⁸ Superfund, in particular, has been a target of many attacks. Other salient issues include the demand for subjecting every environmental regulation to cost-benefit analysis and placing limits on the government's ability to attenuate private property rights.

¹⁵⁹ The total value of mergers and acquisition in 1996 totaled \$229 billion, double of 1988 levels (UNCTAD, 1996).

internal coalitions to develop for championing Type 2 beyond-compliance policies. Importantly, managers skeptical of the benefits of ISO 14000 are not dismissing it altogether; they are often recommending a wait-and-watch policy. Thus, the issue is not whether or not ISO 14000 is beneficial in the long run. There is a fair degree of agreement that it will have benefits in the long run. Rather, the debate is when should a firm invest in ISO 14000 certification. ISO 14000 supporters are finding it difficult to convince skeptics that it is worthwhile to be an early-adopter.

Second, ISO 14000 offers little value to firms that already have well-established environmental management systems. Third, many firms already subscribe to some well-recognized industrial codes of practice such as Responsible Care (Chapter 6). This reduces their need to gain external legitimacy by joining another industrial code of practice such as ISO 14000.

This discussion summarizes the mood within Lilly and Baxter on ISO 14000. Lilly has not mandated that all its facilities get the ISO 14000 certification. Its policy is that if Lilly's customers require that Lilly be ISO 14000 certified, then it will do so. Since it faces no such demands, it sees no urgent need to get ISO 14000 certification for its facilities. Lilly's resistance to ISO 14000 can be traced to the factors discussed above. First, Lilly already has a well-established environmental control process: Environmental Quality System (EQS). This system is modeled on lines of stringent product quality systems employed by pharmaceutical companies for meeting the U.S. Food and Drug Administration's strict guidelines. At the heart of EQS is a computer-based Plant Site Environmental Compliance Listing (PECL) system (see, Appendix 7.1). Lilly implemented this system in 1994. PECL

simplifies environmental permits and regulations into an easy-to-use plant site compliance list. As a result, every tank, every pump, and every compliance point is identified for its environmental requisites (Lilly, 1995a).

Second, as discussed in Chapter 6, Lilly is actively implementing a widely accepted code of industrial practice: the Chemical Manufacturers Association's (CMA) Responsible Care program. Lilly has very active organizational involvement in the CMA. John Wilkins of Corporate Environmental Affairs chairs CMA's Indiana-Ohio-Kentucky chapter of Responsible Care. Although Responsible Care and ISO 14000 have many commonalities, they also differ on some issues. For example, unlike ISO 14000, Responsible Care requires that firms undertake community-outreach programs. On the other hand, ISO 14000 requires external certification where as Responsible Care does not. Thus, apart from the costs of getting the ISO 14000 certification, there will be additional costs involved for Lilly to modify its existing management systems and adopt ISO 14000 compatible systems. However, Eli Lilly will get little incremental external validation for its environmental program by getting ISO 14000 certification for its facilities.

Third, there seems to be some sort of a green-wall developing in Eli Lilly. As shown in Table 7.4, since 1993 Lilly's human resource commitment to environmental programs as a proportion of its net sales has declined. Further, Eli Lilly's corporate environmental program, which was previously headed by a manager of the rank of Vice-President, is now headed by a manager of the rank of a Director.¹⁶⁰ This again reflects the diminished clout of

¹⁶⁰ Lilly's hierarchy is as follows: Chief Executive Officer, Executive Vice-President, Vice-President, General Manager, Executive Director, and Director.

environmental affairs within the organization. As discussed previously, the emergence of a green-wall is a symptom of a more close-fisted approach to Type 2 policies such as ISO 14000.

[Insert Table 7.4 About Here]

Fourth, Eli Lilly has little experience with external audits of its environmental program. Since ISO 14000 requires third-party certification, some managers are apprehensive about the potential misuse of audit information, especially since the EPA does not grant attorney-client privilege on environmental audits.¹⁶¹

Baxter has also adopted a wait-and-see policy on ISO 14000. It has not mandated that its facilities should get the ISO 14000 certification. Verie Sandborg, Baxter's Environmental Affairs Manager, emphasized that:

We are going to take a harder look at the requirements contained in the standard and what value ISO 14001 can add to our program...We essentially have all the basic components. On the whole, our program is comparable [to ISO 14001] (1996: 23).

Like Lilly, Baxter has well-established environmental management systems. As discussed in Chapter 3 and Chapter 8, Baxter regularly invites Arthur D. Little to reassess its state-of-the-art standards and audit its environmental systems against these standards.

¹⁶¹ This is also discussed in Chapter 9.

Therefore, ISO 14000 can contribute little to improving the design or working of Baxter's environmental management systems.

Further, Baxter's environmental programs have received wide recognition (see, Appendix 7.2). Consequently, Baxter gains little incremental external credibility by investing in ISO 14000 certification.¹⁶²

A green-wall has also impacted Baxter's environmental programs in a subtle way. Throughout the 1990s Baxter has had a Vice-President, William Blackburn, heading its corporate environmental affairs. Thus there is no palpable downgrading of intra-organization clout of the environmental department. Also, the environmental managers seemed to have preempted a major demand associated with an emerging green-wall: a demand that beyond-compliance projects be justified on business grounds. As discussed in Chapter 3, Baxter's Corporate Environmental Affairs calculates the net monetary impact of environmental programs on Baxter's profits.

However, this proactive stand on calculating business impact of policies has backfired in case of ISO 14000; its policy supporters have not been able to make a business case for being an early-adopter. As discussed previously, since there is also reduced pressure on firms from external environment for visible environmental initiatives, ISO 14000 policy supporters have not been able to forge a coalition in its support.

¹⁶² As discussed in Chapter 2, on October 1, 1996, Baxter was spun off into two companies: Baxter International Inc. and Allegiance Corporation. In the new Baxter, there is a considerable pressure from non-U.S.-based managers to adopt ISO 14000. They argue that Baxter's state-of-art standards do not mean much in a non-U.S. context; ISO 14000 does. Since nearly two-thirds of new Baxter's production and sales is from outside the U.S., it is conceivable that its senior management may require facilities to have the ISO 14000 certification.

Neither of these firms have rejected the possibility that their facilities would eventually get the ISO 14000 certification. In fact, these firms have become “ISO ready” so that, if required, they can get the ISO certification at short notice. As a result both firms have undertaken some sort of “gap-analysis” by comparing their existing environmental systems with the ISO 14000 requirements and identifying areas where their systems need modification (see, Appendix 7.1). Baxter has also commissioned pilots on ISO 14000; five of its facilities will get the ISO certification and Baxter will use their experience to evaluate future course of action (Baxter 1995a).

To conclude, efficiency-based explanations best explain Baxter’s and Lilly’s decisions not to become early-adopters of ISO 14000. Their decisions were influenced by three factors. First, these firms have substantially invested in their firm-specific environmental management systems. This path-dependency makes ISO 14000 less attractive to them compared to other firms that are thinking of establishing environmental management systems from scratch.¹⁶³ Second, neither of these firms face any external threats that encourage power-dynamics or facilitate emergence of coalitions to push for ISO 14000. Third, as I discussed before, both firms face the emergence of some sort of green-wall. This challenges the adoption of environmental policies, such as ISO 14000, that cannot be justified on the basis of established procedures of investment analysis.

¹⁶³ There is a well-established literature on the impact of path-dependency on adoption of standards. Important works include Katz and Shapiro (1983, 1985), Bessen and Saloner (1988), and Saloner and Shepard (1991).

Table 7.1
Number of Facilities with ISO 9000 Registration

<i>Month/Year</i>	<i>Worldwide</i>	<i>U.S.</i>
January 90	n.a	1
January 1993	27,824	893
October 1993	45,546	2,059
June 1994	70,517	3,960
March 1995	95,476	5,954
December 1995	n.a.	8,400

Source: Uzumeri (1997: 27).

Table 7.2
Harmonized Versions of ISO 9000

<i>Nation</i>	<i>Standard</i>
Austria	AS 3900
Belgium	NBNX50
Canada	CSAZ 299
Denmark	DS/EN 29000
France	NFX50
Germany	DIN ISO 9000
Hungary	MI 18990
India	IS 10201
Ireland	IS 300
Netherlands	NEN ISO 9000
New Zealand	NZS 5600
Norway	NS 5801
South Africa	SABS 0157
Spain	UNE 66900
Sweden	SS ISO 9000
United Kingdom	BS 5750

Source: Johnson (1994: 17)

Table 7.3
ISO 14000 Series: An Overview

ISO Series	Description
ISO 14001	Environmental Management Systems: Specifications with Guidance for their Application
ISO 14004	Environmental Management Systems: General Guidelines on Principles, Systems, and Supporting Techniques
ISO 14010	General Principles of Environmental Auditing
ISO 14011	Audit Procedures
ISO 14012	Qualifications Criteria for Environmental Auditors
ISO 14024	Environmental Labelling
ISO 14031	Environmental Performance Evaluation
ISO 14040	Guidelines on Life Cycle Assessment
ISO 14050	Terms and Definitions

Source: Adapted from Puri (1996: 18)

Table 7.4
Lilly's Environmental Program Staff

Year	Full Time Equivalent in Person Years	Person Years/ Net Sales in \$billions
1990	218	52.2
1991	271	59.8
1992	313	63.1
1993	340	65.4
1994	338	59.2
1995	334	49.4

- Sources:
- (1) Eli Lilly and Company, *1994a Annual Report to Shareholders*, page 31
 - (2) Eli Lilly and Company, *1995 Annual Report to Shareholders*, <http://www.lilly.com/financial/95annual/html/hilites.html>
 - (3) Eli Lilly and Company, *Environmental Annual Report 1992c*, page 10
 - (4) Eli Lilly and Company, *Environmental Annual Report 1995c*, page 34

Chapter 8 Environmental Audits

Background

Enforcing environmental laws is a key challenge for state and local governmental agencies. Often, these agencies are inadequately staffed. Further, employee motivation is low since they are not well-paid and they receive little training for upgrading their skills. In addition, the sheer complexity of most environmental laws and regulations requires that these agencies devote significant proportions of their resources to processing permit applications from the regulatees rather than monitoring and enforcing compliance.¹⁶⁴ Consequently, even in instances of alleged non-compliance, state and local level regulators are often handicapped by lack of resources to document their cases against the alleged violators.

Environmental regulators have two routes by which to address this issue. First, to relax the resource constraint, they could ask for increases in their agencies' budgets. This would enable them to hire more people, pay them higher wages, and invest in their training. As a result, agencies would potentially become more effective in enforcing environmental laws. This route operates from the supply-side: that is, increasing the supply of regulatory services by budgetary increases. This route, though attractive, is difficult in an era of downsized governments, increasing unfunded mandates to the states, and constant criticism

¹⁶⁴ Detailed laws reduce the scope for regulatees' opportunism. However, they increase transaction and governance costs both for the regulatees and the regulators. Further, if the complexity of regulations leaves significant discretion with the regulators, it increases the scope for regulators' opportunism. This argument is analogous to Gary Miller's (1992) critique of Oliver Williamson's (1975, 1985) justification of hierarchies (for details, see Chapter 2). For Williamson, the *raison d'etre* of hierarchies is that they mitigate agents' opportunism given asset-specificity and bounded-rationality. However, Miller argues that this explanation is insufficient since hierarchies do not mitigate managerial opportunism.

of the adversarial relationship between regulators and industry (Chandler, 1980; Marcus, 1984; Vogel, 1986). Of course, the intensity of these factors varies across states: some state governments are less hostile than others to increasing budgets of their environmental departments ; some states are touted to be more business-friendly than others. On the whole, it appears that even though more enforcement is expected from state and local environmental agencies, their resources are not being commensurately increased; indeed many are not being increased at all.¹⁶⁵

The second route to monitor and prosecute non-compliance operates from the demand-side; reducing the demand or decelerating the increases in demand for enforcement and monitoring services in the face of declining, constant, or gradually increasing supply. Such demands are being articulated by a variety of actors such as common citizens, environmental groups, media, and legislators. To meet the demand for these services, regulators can propose to create new institutions (that is, laws and regulations) that generate incentives for the regulatees to self-monitor and voluntarily comply with the laws. U.S. Senator Mike Enzi (R, Wyoming), a vocal supporter of environmental audits believes that¹⁶⁶:

If we want to continue our environmental progress, we need to keep our economy growing. This requires creativity: We must create incentives for business to become proactive in environmental management, and find ways for the overworked regulatory agencies to do their jobs without ever-larger budgets ... shift much of the costs of enforcement to where it belongs: to the polluters themselves ... Anything the EPA discovers first remains subject to

¹⁶⁵ An interesting research question then is: why firms and their managers continue to believe that environmental laws are implemented zealously?

¹⁶⁶ In 1995, Senator Enzi sponsored Wyoming's audit legislation.

its stringent cleanup requirements, fines, and penalties. Environmental audits simply encourage companies to go search their operations voluntarily for environmental problems that the EPA and other regulatory agencies haven't found yet (1997: A18).

The idea behind environmental audits is that if regulatees can create credible management systems to monitor their own compliance, and correct the management systems that led to non-compliance, then the demand for enforcement from the regulators will be reduced. After all, a cleaner environment is the end product of enacting complex and stringent environmental laws and setting up regulating agencies. If regulatees can achieve this end product by themselves, then there would be less demand for external enforcers. As a secondary benefit, since many regulatees feel threatened by the idea of regulators knocking at their doors and peering at their compliance records, this plan will also lessen the confrontational relations between industry and government. Thus, this self-monitoring route seems to be win-win for the regulators and the regulatees.

Unfortunately, the situation is complicated by many issues. Suppose a firm conducting a self-audit of its environmental program discovers violations of environmental laws. Should this firm report these violations to regulators? Will these audit findings be self-incriminatory: will the regulators use them as evidence against this firm in civil, criminal, or administrative proceedings? If so, then firms have few incentives to conduct self-audits and to report violations to regulators.

Further, suppose this firm does detect violations and does not report them to regulators or make this information available to the public. Can such information be

subpoenaed? If so, then again firms have few incentives to undertake internal audits and create evidence that could potentially be used against them.

Such concerns discouraged firms from establishing environmental auditing systems even though such audits were sought by laws such as California's Environment Quality Assessment Act of 1986. In the early 1990s, some state legislatures led by Oregon, began taking a serious look at passing laws that would create incentives for firms to undertake environmental audits. The main debate was whether states should (and could) pass legislation privileging audit information against disclosure to regulators or to the public. The idea was to grant immunity from prosecution as long as regulatees conducting environmental audits corrected violations in a timely manner. For example, Oregon's statement of legislative intent noted that:

In order to encourage owners and operators of facilities and persons ... both to conduct voluntary internal environmental audits of their compliance programs and management systems, and to assess and improve compliance with such statutes, an *environmental audit privilege is recognized* to protect the confidentiality of communications relating to such voluntary internal environmental audits (Oregon Rev. Statute, 468.963 (1); cited in Morandi and Pascal (1995: 2); italics mine).

Colorado's statute noted that if violations were to be detected independently of the audit, the existence of a comprehensive environmental audit program would serve as a mitigating factor in determining the amount of civil penalty. Further, regulators would not assess fines or penalties if firms that report privileged audit information on violations implemented corrective actions to ensure compliance within two years of the disclosure

(Morandi and Pascal, 1995).¹⁶⁷

By the middle of 1995, about twenty states had enacted legislation that encouraged firms to undertake environmental audits. The passing of such legislation was not well-received by the EPA, Department of Justice, most environmental groups, and some sections of the legal community. Initially, the EPA threatened to withdraw the enforcement authority of the delegated federal laws, particularly the Clean Air Act and the Clean Water Act, from states that had passed such legislation. For example, in response to Arizona's proposed bill on this subject, the EPA's regional administrator Felicia Marcus noted that it:

[C]reates one of the broadest secrecy laws in the nation, preventing the public from knowing what has actually happened at the facility It also immunizes certain disclosed activities from enforcement by the state in all but extreme cases (*New York Times*, 1996: 16).

The EPA warned that if this bill was passed then Arizona's Environmental Department would not be allowed to issue permits under the Clean Air Act. As a result, firms with facilities in Arizona would have to go to Washington to get their permits, rather than picking them up from Phoenix.¹⁶⁸

Needless to say, the EPA was widely criticized.¹⁶⁹ Senator Enzi chided the EPA by

¹⁶⁷ This privilege is inapplicable if: (1) the court determines compelling reasons to disclose such information; (2) the firm has abused this privilege for a fraudulent purpose; or (3) this information suggests immediate danger to public health or the environment outside the facility.

¹⁶⁸ Interestingly, some regulatees like Intel Corporation supported the EPA on this subject.

¹⁶⁹ This also coincides with the aggressive insistence of some members of the 104th Congress to reform environmental laws and to cut the EPA's budget.

noting:

It is particularly galling to hear the EPA proclaim these state environmental laws ineffective. Given the federal government's behavior, how can they possibly be a brilliant success? Determined to extinguish these laws, the EPA and the Department of Justice have stated their intention to proceed with investigations of companies that use environmental self-audits -- rendering these state laws moot. The feds have also threatened the states with loss of what little control they have in the administration of the Clean Air Act and Clean Water Act costing them millions of dollars, if they don't stop their environmental audits. This is blackmail *And it is effective blackmail indeed, for until these audits laws are allowed to function as intended, business will never use them to their full promise (Wall Street Journal, 1997: A 18; italics mine).*

EPA's critics also challenged its opposition to granting attorney-client privilege for self-audits by regulatees. They pointed out that the Federal government grants such privilege for self-audits in areas such as the Equal Credit Opportunity Act and the Federal Aviation Administration.

Responding to such criticism, in December 1995, the EPA issued guidelines on self-policing by regulatees. Though it supported self-audits, the EPA reiterated that it would not grant attorney-client privilege to regulatees. However, it promised not to file for punitive damage ("gravity component") if the regulatee would notify the appropriate governmental agency within ten days of discovery of the violation, would undertake follow-up action within sixty days of the audit, and provided that there were not any repeat violations at the facility during the following three years nor patterns of violation by the company during the following five years. However, the EPA might still pursue the "economic gain component,"

that is, recover the gains accruing to the regulatee by violating laws. The EPA also said that it would not pursue criminal action if the violation posed no serious harm, the management did not conceal or condone such violations, and if such violations were not a result of deliberate managerial blindness (Baxter, 1996a; *New York Times*, 1996).

As suggested earlier, most environmental groups opposed granting attorney-client privilege for environmental audits. They argued that such privilege has the potential of being misused by firms: firms can escape prosecution simply by acknowledging that they had violated environmental laws. Consequently, firms would have few incentives to invest resources in implementing laws. Raena Honan, Legislative Director of the Grand Canyon Chapter of the Sierra Club described self-audits as the “Bhopal Bill.” She argued that:

Any self-reported violation would be secret and immune from civil plus criminal penalties for anything less than a second-degree murder We are here at the local level watching out for the public's interest because states do not have a record of protecting their citizens. They have a record of granting corporate welfare and pandering to special interests (*New York Times*, 1996: A26).

Carl Pope, Executive Director of the Sierra Club, in his letter to the EPA's Administrator Carol Browner, suggested that his group may sue the EPA if the agency did not force the states to enforce the federal environmental laws (*New York Times*, 1996).

Some sections of the legal community were also very critical of granting attorney-client privilege to regulatees. Edward Heilig, an Assistant District Attorney in the environmental crimes unit in Suffolk county, New York, noted that:

All they have to do is to stamp their documents with the words 'audit privilege,' and we won't be able to look at them (*New York Times*, 1996: 16).

As a result, Heilig argued that his office would be denied access to information required to investigate environmental crimes. The National Association of Attorneys General identified some legal pitfalls as well (Morandi and Pascal, 1995). They criticized the fact that the onus of proof had been shifted to the regulators who were now required to demonstrate that a violation had occurred before receiving access to audit reports. Further, the judges and not the juries (juries tend to be less sympathetic towards firms) would determine whether a firm abused its audit privilege. As a result of these hurdles, regulators would have to devote more resources towards legal battles for having access to the necessary documents on environmental violations. Consequently, the major objective of the new audit laws -- reducing enforcement responsibilities of the regulators -- would not be served.

To summarize, though some states have enacted legislation granting attorney-client privilege to environmental audits, the EPA, many environmental groups, and some sections of the legal community vociferously oppose such provisions. The EPA does not recognize state laws that grant such privileges. As a result, even if states grant these privileges, the EPA can still have access to the audit information and employ it as evidence against the regulatees for violations under federal laws. Thus, firms have few incentives to establish environmental auditing systems, undertake audits, and to report violations that have been detected by such audits. Further, if they conduct audits, we expect them to focus on management system audits and not on compliance audits (discussed below); that is, they will focus on assessing whether appropriate environmental management systems are in place, and not whether any

law has been violated. Even if they document that some management systems are not in place, this will not necessarily create self-incriminatory evidence.

Puzzle

Given EPA's hostile stance towards attorney-client privileges for environmental self-audits, why did Baxter and Lilly undertake environmental audits at all? Why did they invest significant resources in creating their environmental audit programs?

Further, why did Baxter invite external actors to conduct some of its environmental audits? In 1990, why did it invite Arthur D. Little (ADL) to help define state-of-the-art environmental standards, and then audit its environmental program against these standards?¹⁷⁰

Also, why did Baxter decide to make public such audit findings? Given the legal fuzziness of the status of attorney-client privilege, we expect firms to be wary of conducting audits and making public their audit findings. However, Baxter decided to report a summary of audit findings in its annual Environmental Performance Report. For example, it reported that in 1995 there were 464 audit findings. Of these forty seven were considered "major" items defined as:

[A] serious deficiency that poses significant risk to the company; failure to comply with an important regulatory requirement; or lack of a key

¹⁷⁰ As discussed in Chapter 3 and Chapter 6, under the Management System Verification program, the CMA is conducting external audits of Responsible Care on a pilot-basis. Lilly's Tippecanoe facility is one of these test cases.

environmental management system (Baxter, 1996a: 18).

Of the forty seven major items, twenty-five were in major violations of the company's requirements and twenty-two were in violation of regulatory requirements. Note that Baxter acknowledged serious violations and self-reported them to regulators despite the controversy over attorney-client privilege.

Predictions of Theories of Firms

As discussed in Chapter 2, efficiency-based explanations suggest that firms are expected to employ procedures for assessing profitability of proposed projects. For projects generating cash flows, firms employ managerial tools such as capital-budgeting to assess their profitability. Even though capital-budgeting may not be applicable for policies that do not generate cash flow (such as environmental audits), we do expect firms to undertake some sort of business analysis for assessing their desirability. Therefore, efficiency-based explanations suggest that *ex ante* managers would quantify the cost-benefits of beyond-compliance, and adopt those policies that are projected to provide net benefits to them.

Since it is difficult to quantify the costs-benefits of adopting new management systems, efficiency-based theories offer little help in explaining: (1) why Baxter and Lilly undertake environmental audits, and (2) why Baxter does, and Lilly does not, invite external auditors to undertake such audits.

If policy adoption or non-adoption cannot be explained through efficiency-based explanations, I employ power- or leadership-based explanations. Power-based explanations

predict that Baxter and Lilly would have undertaken audits, and Baxter would have invited external auditors only if the supporters of these policies were hierarchically-superior managers having the capacities to impose their mandate on the organization. Thus, even if some managers opposed these policies, such policy-skeptics would have had little voice in that matter. As a result, we should expect to find evidence of dissent over policies concerning environmental audits. As suggested in Chapter 2, I do expect policy-supporters to provide a rationale for these policies. For example, policy-supporters in Baxter argued that inviting ADL was a demonstration of Baxter's commitment to making its environmental record accessible to external actors and hence a testimony of its confidence in its environmental programs. They further suggested that since ADL is the oldest, and probably the most established environmental consulting firm, its inputs in defining the state-of-the-art standards will be most helpful. Consequently, external actors will view the state-of-the-art standards defined by ADL as credible and not self-serving. ADL's audit will also provide a useful external perspective on how Baxter could improve its environmental performance.

Skeptics may not accept policy-supporters' arguments. Power-based theories predict policies would then be imposed on the organization. As a result, we should expect to find evidence of opposition to environmental audits. In contrast, leadership-based explanations suggest that policy-supporters would succeed in convincing skeptics and thereby generating consensus over these policies. Even though these policies are opposed by skeptics in the short-run, they eventually are adopted by a consensus.

Lilly's adoption of environmental auditing policies is best explained by leadership-based theories. As discussed subsequently, policy-supporters within Lilly managed to create

a broad degree of organizational consensus on a new way of evaluating performance on environmental issues. Their strategy was to convince skeptics, whether at facilities or in corporate groups, of the long-term benefits of having strong internal environmental audit programs, notwithstanding the EPA's opposition.

Baxter's adoption of environmental audits, especially its invitation to ADL to help define state-of-the-art standards, and the accelerated schedule of its implementation, met with internal opposition. Since this opposition was overcome by power-based route (the policy-supporters were hierarchically powerful and policy was imposed), Baxter's response to environmental audits is best explained by power-based policies.

Analysis

Baxter and Lilly committed themselves to conducting environmental audits and established active programs to audit their facilities, divisions, and corporate groups. Eli Lilly's *Environmental Policy and Guidelines* consider auditing an integral part of Lilly's environmental policy:

The company will regularly assess and report to management and the Board of Directors on the status of its compliance with this policy and with environmental laws and regulations (Eli Lilly, 1995 June: 4).

Likewise, Baxter's *Environmental Policy* states that:

Corporate environmental personnel, division, and facilities will provide coordinated, effective environmental training, awareness and audit programs wherever relevant (Baxter, Env. Manual, 3/94).

Both these firms conduct two types of audits: compliance and management systems. Let me give an example to differentiate these audits. Assume that while auditing a facility, the auditors discover an unmarked drum containing hazardous wastes. If this were a compliance audit, then the auditors would inquire whether any law(s) requires that drums containing hazardous substances be appropriately marked. If so, then which laws, and who is to be held responsible for this violation. In contrast, if this were a management systems audit, then the auditors would inquire whether the facility has management systems to ensure proper labeling of drums containing hazardous wastes. If so, then why did they fail, and how can the system design be modified to prevent reoccurrence of such failure?

Compliance and management systems audits complement each other. Compliance irregularities may occur due to system or individual failures. However, individual failures can be mitigated by system changes (for example, environmental violations will result in demotion and pay cuts) that alter incentives for actors or by training individuals so that they perform better (the assumption being that better training can mitigate individual failures).

As of 1997, Lilly relies on internal audits only. Lilly's audit teams are comprised of managers from its corporate environmental groups (Environmental Affairs and Environmental Legal) and environmental managers from plant sites outside of the sites being audited.

The year 1989 was a watershed in the evolution of Lilly's environmental auditing program. In that year, Ralph Hall of Corporate Environmental Legal group led Lilly's first internal audit. This focused on compliance of the Tippecanoe facility with the requirements

of the Resource Conservation and Recovery Act (RCRA). Since it revealed certain discrepancies and shortcomings, primarily caused by inadequate staffing, it provided impetus to supporters of environmental programs within Lilly to ask the Environmental Management Committee (EMC) for more resources to strengthen audit programs. Robert Williams, the Vice-President of Environmental Health and Safety (EHS) and Quality Control/Quality Assurance (QC/QA), and Daniel Carmichael, Deputy General Counsel, were key actors in convincing the EMC to institutionalize environmental auditing. In the highest positivist tradition, they argued that Lilly should be able to measure its compliance with its *Environmental Policy and Guidelines* and that environmental audits were useful tools for this task.

During 1989-1994, Lilly focussed primarily on compliance audits. Since 1994, systems audits have also gained prominence. As shown in Table 8.1 below, since 1992 Lilly has also been auditing its suppliers, waste-treatment sites, and third-party manufacturers.¹⁷¹

[Insert Table 8.1 About Here]

Lilly's environmental audit program has survived and prospered for many reasons. First, this program has had very committed supporters, particularly Joan Heinz of the Corporate Environmental Legal group, and John Wilkins and Jonathan Babcock, both of the Corporate Environmental Affairs group. These individuals ensured that environmental audits

¹⁷¹ In 1996, Lilly also began auditing its non-U.S. facilities.

are employed not merely as tools of corporate oversight, but also as tools of system improvement. As one of the managers observed, the audit group is careful not to appear to the facilities as if they “are the internal EPA.” As a result, facility managers have not felt threatened by the prospect of having their facility-level environmental programs audited.

Second, these managers convinced the organization that Lilly's environmental management systems were fairly robust and that they do not expect audits to uncover any major violation that EPA or other regulators would not have discovered in the normal course of investigation. As discussed earlier, since the EPA does not recognize attorney-client privilege for environmental audits, firms are wary of conducting audits and creating self-incriminatory evidence.

Third, these managers emphasized that even though audits were opposed by the EPA and environmental groups, in the long run these actors would begin to appreciate their usefulness. Thus, these individuals succeeded in convincing skeptics within Lilly that a proactive policy to establish an internal auditing program may have some short-term risks but has significant long-term payoffs.

Fourth, this group has constantly explored ways to make environmental audits less burdensome for Lilly's facilities. Environmental auditing is a cumbersome and documentation-intensive process primarily because of the complexity of environmental laws. As a result, facility managers spend a significant amount of their time preparing for audits and implementing the findings of the auditors. Facilities are subjected to other audits as well, such as financial, QC/QA, and health and safety. The environmental audit group has been very sensitive to the needs of the facilities when scheduling their audits. To minimize

disruption in the facility's routine operations, they communicate their audit check-lists in advance. Currently they are exploring with QC/QA group whether joint environmental/QC/QA audits can be conducted. All such actions signal to the organization the sincerity and constructive intent of environmental auditors. As a result, the policy-supporters generated a broad degree of organizational consensus on the usefulness of environmental audits, notwithstanding the hostile stance of the EPA towards it.

As discussed in Chapter 3, in the late 1980s, Baxter began revamping its environmental program. Baxter initiated its environmental audit program in 1988. It hired Arthur D. Little (ADL) to assist the Environmental Legal Affairs group in developing an audit protocol. ADL is well known for its expertise in environmental auditing; it has been doing such audits since 1977 and conducts about 400 environmental audits annually. Once the protocol was developed, Baxter tested it by conducting pilot audits in three facilities: Bentley facility in Irvine, California, Pharmaseal facility in Jacksonville, Texas, and the Dade-East plant in Miami, Florida. Overall, the protocol was found to be excellent, requiring only minor changes (Baxter, 1988). As a result, the environmental protocol was adopted firm-wide.

In 1990, Baxter took another critical step towards strengthening its environmental auditing program. As discussed in Chapter 3, Baxter's senior management decided that Baxter would have a state-of-the-art environmental program. It invited ADL to help them in defining state-of-the-art environmental standards for firms in similar risk categories, and then audit Baxter's programs against these standards. If a facility met these standards, it was certified as having achieved the state-of-the-art standards. ADL also noted that since the

state-of-the-art standards are dynamic, periodic assessments are required to recalibrate them, and then to evaluate whether facilities meet the new standards.¹⁷²

Baxter's decision to invite ADL was internally opposed on four counts. First, as discussed previously, skeptics were concerned about the fuzziness of attorney-client privilege for environmental audits. Second, some managers were uncomfortable with the notion of state-of-the-art standards and committing their facilities to these standards on an accelerated implementation schedule. Some of them questioned the very possibility of defining state-of-the-art standards. Third, some facility managers viewed internal audits as yet another coercive tool employed by the corporate office to make them fall in line. Like many other large firms, Baxter has a tradition of contestation between the corporate office and the facilities. Environmental audits were yet another arena of such contestations. Fourth, since the cost of hiring external auditors were to be eventually borne by facilities, facility managers questioned the need for inviting external auditors at all.

The policy-supporters realized that it would be difficult to generate quick consensus within Baxter on environmental audits. I believe a key reason was that the pace and extent of change in environmental programs required to implement state-of-the-art standards was significant. In the mid-1980s, Baxter had a faltering environmental program, and in the 1990s, it decided to have the best program in the industry. Instead of slow and consensual change, policy-supporters wanted a rapid change. Since such change was resisted, it had to be mandated from the top management. In October 1990, Vernon Loucks, Baxter's CEO, in

¹⁷² ADL audited again in 1993 and 1995. In 1995, it co-audited with Skadden Arps.

his address to Baxter's annual internal environmental conference, observed that:

Our overall goal as stated in this policy is this: to develop an environmental program that will be considered state-of-the-art among the Fortune 500 companies. By state-of-the-art we mean among the best in terms of day-today problem solving and compliance, and in managing our short- and long-term environmental risks. We also mean among the best at minimizing the generation and discharge of waste and other adverse impacts on the environment. Our focus is not just on our operations, but on our products and services as well (Baxter, 1990: 3).

Loucks went on to emphasize that dissent would not be tolerated. He said:

If anyone doubts we are serious about our new policy and goals, let me put that to rest now. We will monitor the company's environmental program, and the program of each division thorough and annual state-of-the-program report. I have requested that this report be presented to the Senior Management Committee and our board of directors. Let me assure you, inadequate progress will not be tolerated (Baxter, 1990: 3-4; italics mine).

To reinforce Vernon Loucks' message, during the 1991 annual environmental conference, Marshall Abbey, the Senior President, General Counsel, and Chairperson of the Environmental Review Board observed:

Why go to all this trouble when we could probably get by with much less? The answer to this question lies in another question: what kind of company do we want to work for?

Do we want a company that is concerned with people's health and their right to live in a healthy environment? Do we want a company that stands apart from polluters and violators of environmental law; a company that is doing something about the environment, not just giving a lip service.

Vern Loucks wants this kind of company. The Environmental Review Board

does too. And if that's the kind of company you want, I think you do, then you must find one like Baxter that is pressing for state-of-the-art in the environmental area. That's what our goal is all about. *And that's my answer to the skeptics* (Baxter 1992b: 4; Italics mine).

Highly visible support from the CEO and the Chairman of the ERB clearly signaled that Baxter's senior management attached high priority to the environmental audit program. As a result, Type 2 policies on environmental audits, both internal and external, were adopted inspite of opposition from policy-skeptics.¹⁷³

To conclude, although there was legal controversy on the status of attorney-client privileges for environmental audits, Lilly and Baxter established strong audit programs. Efficiency-based theories offer little help in explaining adoption of Type 2 policies such as environmental audits because it is difficult to assess *ex ante* their future benefits. Leadership-based policies suggest that policy-supporters succeed in convincing their organization of the usefulness of such policies. Such policies are adopted through a consensual route. If policy-supporters cannot convince their organizations, then the policy may not be adopted. If it is adopted, as in Baxter's inviting external auditors, then it is through imposition.

¹⁷³ As of 1997, Baxter conducts both compliance and management systems audits. Its internal audits involve environmental managers from the corporate groups (Corporate Environmental Affairs and Corporate Facilities Engineering), divisions, and facilities. Baxter has two kinds of internal audits: (1) divisional audits in which the divisional environmental manager audits facilities in his or her division, and (2) corporate audits in which corporate groups along with divisional and facility managers audit facility-, divisional-, or corporate-level programs. In both these audits, the auditors finalize the site-specific checklist that is shared with the site managers a month in advance. As a result, the audited site has a prior knowledge of the auditors' expectations. During the audit if some problem areas are identified, then the auditors and the site managers together identify strategies to address these problems. These strategies are then recorded in the final audit report and the site manager identifies the resource-person(s) and establishes deadlines for each task. Since some skepticism towards external audits remains, the external auditors are first asked to defend their findings and recommendations before the environmental managers of the audited sites and only then present them to the ERB.

In Lilly, policy-supporters succeeded in inducing consensus because the pace of change was gradual and audit standards were defined internally. Importantly, their firm was committed to implementing all applicable environmental laws, had established systems, and had invested resources for achieving them. Consequently, skeptics bought into the argument that environmental audits were not expected to uncover major violations that could create problems for them.

In Baxter, the environmental audit program was adopted through a power-based route. Some managers were skeptical about the pace of implementing the state-of-the-art standards, and that, these standards were being defined with the help of ADL. Since policy-supporters did not succeed in generating a quick consensus on these issues, they resorted to having the policy imposed by the top-management.

Table 8.1
Internal Audits Performed by Lilly

	<i>Lilly Facilities</i>	<i>Non-Lilly Facilities</i>
1992	8	15
1993	8	23
1994	12	12
1995	15	5

Source: http://www.lilly.com/environment/96update/96gr9_1.htm/ page 1 of 1/
05/02/07/ 00:01:59

Chapter 9 “Green Products”

Background

The “greening” of firms can imply both the greening of their value-addition processes and of their products. An interesting question therefore is: how does greening influence the purchase decisions of consumers or customers (henceforth customers)?¹⁷⁴ To explore this subject, I examine two dimensions of greening. First, I explore whether greening is verifiable by customers or actors external to firms. Second, I examine whether greenness of firms or products is important in influencing purchase decisions.

Apropos the first dimension, I expect that customers will often have little access to reliable information on this subject. Consequently, they may find it difficult to factor in environmental aspects of firms' processes and products in their purchase decisions. Such information asymmetries would therefore lead to market failures.¹⁷⁵

To mitigate market failures, policy interventions may take place at various levels. Governments can enact laws requiring firms to report on aspects of their environmental program. For example, under the Toxic Release Inventory Program (Chapter 5), firms with

¹⁷⁴ By customer, I mean the purchaser of a product and by consumer, I mean the user of a product. For a firm marketing final products, distribution channels are its customers, and individual actors purchasing from these outlets are its consumers. For industrial and intermediary products, where one firm sells to another, the term customer is more applicable. For example, if Baxter sells dialysis machines to healthcare centers, then these healthcare centers are Baxter's customers.

¹⁷⁵ Based on degrees of information asymmetries, goods can be classified into three categories: search goods, experience goods, and post-experience goods. Consumers can determine the characteristics of a: (1) search good prior to purchasing it; (2) experience good after purchasing it; and (3) post-experience good only with a lag after consuming it. Thus, information asymmetries (and concomitant market failures) are most severe in post-experience goods and least, if at all, in search goods (Weimer and Vining, [1989] 1992).

manufacturing facilities in the U.S. are required to report annual releases of specified toxic chemicals. Likewise, firms may seek to mitigate market failures at the industry level. For example, they may sponsor industrial codes of environmental self-regulation such as the Chemical Manufactures Association's Responsible Care program (Chapter 6) that mitigate information asymmetries. Finally, firms may seek to mitigate information asymmetries at their level only. For example, they could obtain environmental certifications such as ISO 14000 (Chapter 7) that are awarded by credible external auditors. All such measures, whether at the macro, industry, or firm levels, seek to provide credible information on the “greenness” of firms and their products. Consequently, they help customers to factor in firms' greenness in their purchase decisions.

The second dimension I examine is whether customers consider greenness of firms an important factor in their purchase decisions. Customers base their purchase decisions on a variety of factors such as price, performance, availability, and reliability of products as well as the corporate image of firms that are manufacturing and marketing them. Consequently, the level of greenness of firms and their products is one of the many factors influencing the purchase decision; customers may or may not prioritize it over other factors.

As discussed in Table 9.1 below, based on the two dimensions -- verifiability of greenness and importance of greenness -- we can identify four categories of situations.

[Insert Table 9.1 About Here]

Cell 1 represents market situations in which customers not only find it difficult to

verify firms' claims on greenness, they also do not attach much importance to them. For example, customers will find it difficult to verify whether a firm has replaced its underground storage tanks with expensive above-the-ground tanks, whether it conducts internal environmental audits, or whether heart valves are bio-degradable. Importantly, for some customers, even if such claims are verifiable, the adoption or non-adoption of such green policies would not influence their brand choice. Consider an individual wanting to purchase an anti-depressant. It is unlikely that this individual would purchase Prozac, an anti-depressant produced and manufactured by Lilly, simply because Lilly has removed underground storage tanks from its facilities and replaced them with expensive above-the-ground tanks, or because Prozac is bio-degradable, or because it is packaged in recycled material. This individual probably has little access to information on Lilly's environmental policies. And, even if the customer has such access, this knowledge may not significantly affect its purchase decision. For an anti-depressant, the customer may focus predominantly on Prozac's performance and cost of treatment, giving little importance to Lilly's environmental policies or to Prozac's environmental impact. Similarly, customers wanting to purchase heart-valves will probably not buy them from Baxter just because they are bio-degradable, or because Baxter had invited Arthur D. Little (ADL) to help it in defining state-of-the-art environmental standards, and then to audit its environmental programs against them.

Cell 4 represents market situations in which although customers can verify levels of greenness, they do not consider it important in choosing brands. For example, firms may have the ISO 14000 certification, join Responsible Care, or join the EPA's 33/50 program.

All these are examples where the greening of firms can be verified. However, this greening may be unimportant for customers wishing to purchase anti-depressants or heart valves.

If customers do not attach importance to the greenness of firms' policies or products (Cells 1 and 4), then supporters of such environmental policies within firms probably also do not justify them in terms of their impact on customer goodwill. As discussed in Chapters 4, 5, and 6 (Underground Tanks, the 33/30 program, and Responsible Care), the adoption of Type 2 policies is best explained by understanding how policy-supporters managed to convince the organization of the long-term benefits of these policies. These benefits include reducing environmental risks, and having goodwill of regulators, local communities, and industry-level organizations.¹⁷⁶

Cell 2 represents market situations in which, although customers consider the greenness of firms or their products as important, they have little access to verifiable information on this subject. Consequently, customers have to rely on claims made by firms or on media reports. Such situations are unlikely since if firms recognize that customers value greenness, then they can be expected to make efforts to provide information on this subject. If anything, firms are often perceived to be over-stating the achievements of their environmental programs.

Cell 3 represents those situations in which, customers are able to verify levels of greenness and they also consider greenness as important in influencing their brand choice. For example, purchase decisions of some European customers are critically influenced by

¹⁷⁶ Specifically, only supporters of ISO 14000 suggested that adoption of this policy would have a favorable impact some customers.

whether or not a supplier has the ISO 14000 certification.¹⁷⁷ Or, some customers may only purchase products having a 'green dot.'

Note that greenness can be certified at the firm level (ISO 14000) as well as at the product/brand level (green dot). This distinction becomes important for thinking about business strategy. Do customers buy products based on brand's attributes only or are their purchase decisions also significantly affected by company's image and philosophy (Charter, 1992)? If purchase decisions are significantly affected by company's image, then firms have incentives to invest in firm-level programs and then have them certified. As discussed previously, for certain categories of customers, firm-level certification is indeed very significant.

However, if customers buy brands, and not a firm's philosophy, then firms have incentives to green their products, certify this, and then communicate it to their customers.¹⁷⁸ Thus, customers can examine the attributes of such products, make inferences about their environmental impacts, and factor them into their decisions on brand choice. This is the focus of this case: how do firms deal with beyond-compliance policies that influence the

¹⁷⁷ Most German carpet importers require suppliers based in developing countries to document that they do not employ child-labor in their facilities. As a result, many carpet exporters in countries such as India employ external auditors to verify that their facilities do not employ children.

¹⁷⁸ Companies such as Procter and Gamble, the biggest consumer goods company in the world, focus on communicating the benefits of their brands. I am not arguing that such brand-focussed firms ignore their corporate image. They do not. However, such firms focus most of their advertizing on talking about, for example, the superior performance of Tide detergent, the freshness of Ivory soap, or the beauty-enhancing effect of Oil of Olay. Most consumers probably do not link all these brands to Procter and Gamble.

Of course, some other firms focus on corporate advertizing or have a generic brand name for their various products. In particular, Japanese companies have generic brand names. Thus, we have a SONY television, SONY VCR, and SONY Walkman.

attributes of their products, given that these attributes are valued by their customers? In my subsequent discussion, I employ the term “green products” to imply those products that specifically aim to deliver enhanced environmental quality as one of their key product benefits.¹⁷⁹ Thus, marketers of green products add environmental quality to:

[S]tandard mix of decision-making variables. But it is a unique variable, for it is omnipresent, serving as backdrop against which all strategic decisions are made ... (such as product and packaging design and development, labeling and advertising, or promotional strategies) (Coddington, 1993: 2).

Firms can green their products by employing six types of strategies:¹⁸⁰

1. Repair: They extend the life of a product by repairing its parts;
2. Recondition: They extend the life of a product by significantly overhauling it;
3. Remanufacture: They emphasize that the new product is based on old ones, as in reusing laser printer cartridges;
4. Reuse: They design a product so that it can be used multiple times;
5. Recycle: They emphasize that a product can be reprocessed and converted into raw material to be used in another or the same product;
6. Reduce: They claim that even though their product uses less raw material or generates less disposable waste, it delivers benefits comparable to its former version or

¹⁷⁹ Green products and environmental marketing often imply the same thing. Coddington defines environmental marketing as “marketing activities that recognize environmental stewardship as a business development responsibility and business growth opportunity....” (1993: 1).

¹⁸⁰ The first five have been suggested by Charter (1992b) and I have added the sixth category.

to competing products.

Customers certainly emphasize purchasing green products for their environmental benefits. However, such products may also be valued for their impact on costs or revenues. Interestingly, management strategies such as Total Quality Management (TQM)¹⁸¹ may also be viewed as contributing to making products environmentally-friendly. TQM proponents claim that adopting this strategy will translate into more reliable and durable products. Clearly, such products put less burden on the natural environment. However, I do not classify them as green products because neither firms highlight nor customers perceive environmental benefits as key attributes of these products.

As discussed in Chapter 2, to offset the higher costs of incorporating environmental attributes, green products are often expensive. Thus, marketing green products may be viewed as attempts by firms to transform environmental benefits from public to private goods. Then why do firms not adopt this route *en masse*? The reason is that a premium pricing strategy results in a collective action dilemmas at the customer level. Rational customers may want to enjoy the benefits of clean environment (from which they cannot be excluded) without paying for them. If such 'defections' are widespread, then markets for premium green products will remain small, and firms will have little incentives to produce and market such products.

However, such defections do not always occur. As a consequence, markets for green

¹⁸¹ For a detailed discussion, please refer to Chapter 7 (ISO 14000).

products in the U.S. are estimated to be over \$200 billion annually (EPA, 1990). At a more sophisticated level, one can argue that since customer attitudes and purchasing habits are not identical, the above discussed collective action dilemmas characterize only a subset of all consumers. The 1990 and 1992 surveys of customers' environmental attitudes by Roper Organization classifies customers into five categories¹⁸²:

1. True-Blue Greens: Their actual behavior is consistent with their strong environmental beliefs. They participate actively in environmental debates and are willing to pay a premium for environmentally-sound products. They comprised 11 percent of the U.S. population in 1990 and 20 percent in 1992.
2. Greenback Greens: They are committed to environmental issues at an intellectual level and are also willing to pay a premium for environmentally-sound products. However, they are not activists. They comprised 11 percent of the population in 1990 and 5 percent in 1992.
3. Sprouts: Though they do profess some sort of environmental concern, they do not exhibit a consistent pattern of pro-environmental behavior. They comprise 26 percent of the population in 1990 and 31 percent in 1992.
4. Grouzers: Not only do they lack any sort of pro-environmental attitudes, they also question the claims of others who claim to have such an attitude. They complain about higher prices and loss of jobs that accompany environmental regulations. They comprised 24 percent of the population in 1990 and 9 percent in 1992.
5. Browns: They ignore environmental issues and will not pay a premium for environmentally-sound products. They comprised 28 percent of the population in 1990 and 35 percent in 1992.

Importantly, the proportion of potential customers for a given product in any of the

¹⁸² There are other classifications as well. For example, J. Walter Thompson classifies consumers as Greener-than Green (23%); Green (59%); Light Green (15%); and Un-Green (3%). Green Market Alert classifies them as Visionary Greens (5-15%); Maybe-Greens (55-80%); and Hardcore Browns (15-30%). For a detailed discussion, see Coddington (1993: 79-82).

five categories is a function of many variables such as the financial impact of the premium price on the family budget and the extent of the premium. The same customer may exhibit different attitudes for different kinds of products or for the same product in a different settings. Further, other demographic factors are also important in influencing the attitudes and behaviors of consumers towards environmental issues. For example, research suggests that children often are forceful advocates of purchasing green products (Coddington, 1993).¹⁸³

To summarize, based on two dimensions -- verifiability of greenness and importance of greenness -- I have identified four categories of situations. Cell 1 represents market situations in which customers not only find it difficult to verify firms' claims on greenness, but also do not attach much importance to them. Cell 2 represents market situations in which, although customers consider greenness of firms or their products important, they have little access to verifiable information on this subject. Cell 3 represents situations in which customers are able to verify levels of greenness, and they also consider greenness as an important influence on their brand choice. Cell 4 represents market situations in which, although customers can verify the levels of greenness, they do not consider it important to their choice of brand.

I employ the term "green products" to refer to those products that specifically aim to deliver enhanced environmental quality as one of their key benefits. Commercially successful green products can be placed in Cell 3.

¹⁸³ Also, I met with many managers in both Lilly and Baxter who claimed that their respective children have played key roles in influencing their professional attitudes towards environmental issues.

Baxter and Lilly: Response

As discussed in Chapter 3, Lilly manufactures and markets ethical or prescription pharmaceuticals. Some of Lilly's products such as insulin are over-the-counter (OTC). However, since patients often purchase these products on their doctors' recommendations or prescriptions, such OTCs are *de facto* ethical drugs.

For ethical drugs, the purchaser is not the decision-maker regarding brand choice: patients are the purchasers and their doctors are the decision-makers. Research suggests that among various attributes of an ethical drug, doctors consider its efficacy most important; after all their professional reputation depends on the drug's performance.¹⁸⁴ One could argue that other things being equal, the "greenness" of the drug may become important. That is, if a doctor is asked to choose between two ethical drugs that are equal in all aspects such as efficacy, cost, and reputation of the manufacturer, then this doctor may prefer the greener drug. However, such other things are seldom equal. Even though generic drugs such as basic antibiotics manufactured by different firms may be equivalent on most major attributes, by employing various tools of marketing, firms often succeed in differentiating their brand from the rest.¹⁸⁵

¹⁸⁴ I have similar findings from my previous career at Procter and Gamble as a brand manager of the Vicks range of OTC drugs.

¹⁸⁵ This is also a major issue of debate in the literature on international health policy, especially what ought to be the stance of the World Health Organization on this issue: should it encourage developing countries to promote generics that are less expensive than branded drugs or should it not offer any recommendations on this subject? Some countries such as Bangladesh have legislated that only generics be sold in certain disease categories (C. Prakash, 1997).

Further, since the health-care industry is highly research-intensive,¹⁸⁶ new drugs claiming better efficacy are being continually introduced. As a result, it is difficult to imagine that doctors will face similar situations on brand choice for ethical drugs in any major disease category.¹⁸⁷

I am not arguing that firms' environmental policies do not impact doctors' brand choice for ethical drugs. They certainly do. Suppose there are extensive media reports on pollution caused by a pharmaceutical firm or adverse environmental impacts from its products. Surely doctors may begin to have negative opinions about this firm and its brands. However, adoption of beyond-compliance policies or greening products will probably not persuade doctors to prescribe the firm's brands. To employ Herzberg's (1966) terminology, for doctors, a lack of negative publicity about the environmental policies of a firm, or the environmental impact of an ethical drug is a 'hygiene' factor.¹⁸⁸ However, the presence of environmentally-friendly features in ethical drugs or the adoption of beyond-compliance

¹⁸⁶ As discussed in Chapter 3, in 1995 Lilly invested almost 15 percent of its net sales in research and development.

¹⁸⁷ Of course, one can argue that even if *mutatis mutandis* (other things being equal) does not hold, doctors may be willing to prescribe greener drugs that are only marginally less efficacious (or marginally more expensive) than non-green drugs, as long as greener drugs are efficacious enough (or cheap enough) for treating patients. Such possibilities certainly exist for basic drugs such as basic antibiotics or sulpham drugs. However, doctors' brand choices reflect many constraints such as cost of processing information and their bounded rationality. During my tenure at Procter and Gamble, I discovered substantial research on how doctors chose brands. This topic is rather vast and outside the purview of this dissertation. I only want to emphasize that for various reasons, *mutatis mutandis* or the trade-off scenario described above, often does not hold in real life.

¹⁸⁸ Extending Maslow's (1943) theory, Herzberg develops a theory of work motivation. His study focuses on two work-related factors: those that turned people on and those that turned them off. He labels the former 'motivators;' these factors pertain to the job content such as levels of creativity and recognition. He labels the latter 'hygiene' factors; their presence only prevents dissatisfaction among employees. These factors are related to the job context such as company policies, working conditions, and salary.

policies by a firm, is often not a 'motivator' for recommending the brands of ethical drugs manufactured by this firm. Factors such as the cost of treatment, efficacy, and lack of side-effects are the 'motivators' for doctors in brand choice. On this count, Lilly has little reason to market green ethical drugs or portray its existing drugs as green.

In contrast to Lilly, Baxter markets green products; medical supplies that are purchased by hospitals and other health-care suppliers. Some of Baxter's green products are briefly described below (Baxter, 1994d; 1996b).¹⁸⁹

- a) **ACCESS:** Baxter and Waste Management, Inc. have formed a strategic alliance to offer Baxter's corporate customers solutions to all their environmental issues. Waste Management, Inc. is the world's largest waste disposal company offering consulting services on waste reduction, recycling, treatment and disposal of waste, etc.
- b) **ValueLink:** Baxter repackages bulk products to customer specifications, delivers them daily to the patient floors using reusable totes, and recycles their bulk-packaging. Consequently, this eliminates bulk-packaging from customers' waste streams.
- c) **Envision Recycling:** Baxter provides training to hospital staff to sort plastic intravenous bags, pour bottles, and over pouches. Baxter then collects, transports, and recycles them.
- d) **Custom Sterile Packs:** Baxter offers customers individualized packs of medical items thereby reducing packaging and saving them disposal costs.
- e) **Interwoven:** Baxter offers to collect, clean, and deliver disposables such as gowns, drapes and towels so that they can be reused by customers.

¹⁸⁹ Baxter sought to address customers' environmental concerns in other ways as well. In 1995, it established a Customer Waste Council (CWC), a multi-divisional and cross-functional initiative to better respond to customer' environmental concerns. As of 1997, the CWC consists of five teams whose objectives include evaluating the latest technologies in reusable shipping containers; investigating what environmental information consumers are requesting, why they are making these requests, and how Baxter can fulfil them (Baxter, 1996b).

- f) **Shared-Risk Agreement:** The objective is to reduce the amount of products used by Baxter's customers. For every customer, Baxter analyses past patterns of product usage. Then both parties establish a target usage for the future. If the customer uses more than this target, then both Baxter and the customer share the additional costs. If the usage is below target, then both Baxter and the customer share the resultant savings.

Puzzle

I have discussed why it makes little sense for Lilly to manufacture and market green ethical drugs. I have argued that the presence of environmentally-friendly features in ethical drugs are often not what motivates doctors to recommend them to their patients. Factors such as the cost of treatment, efficacy, and lack of side-effects are the key motivators in brand choice. On this count, Lilly has little reason to market green ethical drugs or portray its existing drugs as green. Hence, my subsequent discussion will focus only on Baxter's response to green products. Therefore my puzzle is: why does Baxter market green products?

Predictions of the Theories of Firms

As discussed in Chapter 2, efficiency-based theories predict that firms have procedures for assessing the desirability of proposed projects. If projects require significant capital expenditure and are predicted to generate cash in the future, then firms employ tools such as capital-budgeting to assess their profitability. Baxter did not incur significant capital expenditures to adopt policies on green products. However, since such products were expected to generate revenue, Baxter could have projected a rate-of-return for such policies. Hence, efficiency-based theories predict that Baxter would have evaluated the profitability

of marketing green-products by employing tools such as capital-budgeting, and would have adopted them only if they met the capital-budgeting criteria.

Since Baxter did not employ any established procedures to evaluate marketing of green products, efficiency-based explanations offer little help in understanding Baxter's policymaking process on this subject. If policy adoption or non-adoption cannot be explained by efficiency-based explanations, then my strategy is to employ power- or leadership-based explanations. Power-based explanations predict that Baxter will market green products only if the supporters of this policy are hierarchically-superior managers having the capacities to impose their mandate on the organization. Thus, even if some managers oppose these policies, they have little choice in the matter. As a result, we should find evidence of dissent over policies on marketing green products. However, we do expect policy-supporters to provide a rationale for these policies to their organization.

In contrast, leadership-based explanations suggest that policy-supporters succeed in convincing their organization of the benefits of marketing green products. They might suggest that the demand for green products is not a passing fad; that it reflects fundamental changes in ways customers prioritize the desired attributes of any product. Further, they may point out that new laws and regulations (see below) will probably create incentives for customers to demand products that have less packaging or that do not require polyvinyl chlorides (PVCs) for their packaging. Thus, policy-supporters manage to create a consensus about marketing green products, even though such policies cannot be justified on some well-established profit criteria.

Analysis

Many recent environmental laws and regulations have sought to promote the reduction, reuse, and recycling of resources. The objectives of such laws are twofold: to reduce the volume of wastes, particularly solid wastes, that are overwhelming land-fills, and to conserve raw materials. One of the strategies has been to enact “take-back” legislation that requires manufacturers or retailers to take-back packaging at no additional cost to consumers. Such laws are intended to create incentives for manufactures to reduce packaging. Europe, in particular, has pioneered such take-back legislations. In 1981, Denmark enacted a law requiring manufactures to use reusable beer and soft drink containers and requiring beverage retailers to take-back all such containers regardless of whether or not they sold them.¹⁹⁰ In 1991, Germany enacted its own version of take-back legislation requiring firms, or their designated agents, to take-back and recycle all packaging. Consequent to a rather successful German take-back program, in 1994 the European Commission issued its own version of take-back and recycling directive. In the U.S. as well, pressure has been building for firms to reduce their packaging. As discussed in Chapter 3, in 1991, the Coalition of North Eastern Governors (CONEG) challenged the top two hundred users and producers of packaging in the U.S. to eliminate or reduce the amount of packaging generated by their companies.

Most of Baxter's green products emphasize packaging reduction, and as a consequence, reducing pressure on their customers' waste streams. This strategy makes sense

¹⁹⁰ The Danish legislation was criticized however as a non-tariff barrier. Though the take-back clause of this regulation still holds, the European Court of Justice struck down the reusable provision (Vogel, 1995).

since many of Baxter's products are bulky, requiring substantial packaging.¹⁹¹ In response to the CONEG challenge, Baxter committed to a fifteen percent reduction in per-unit packaging weight by 1996 with 1990 as the baseline (Baxter, 1991b). Baxter's packaging task-force set guidelines on issues such as reducing the use of inks containing heavy metals, modifying Corporate Identity Guidelines for the company logo to allow for the use of recycled paper for office stationary and packaging materials, applying Society of Plastics Industry and American Paper Institute recycling symbols for appropriate packaging, promoting the sale of single package multi-product medical kits, promoting the use of reusable shipping containers, and minimizing the use of chlorine-bleached papers and paperboard in packaging. Thus, supporters of policies on green products argued that because of such initiatives, Baxter was in a position to leverage its packaging reduction expertise for marketing green products.

Policy-supporters also highlighted the EPA's (then) recent proposal on stricter air-pollution control standards that would have required upgrading existing medical waste incinerators. Hospitals (Baxter's customers) either have their own incinerators or they send their medical wastes to a third party for incineration. It was estimated that such an upgrade might cost up to a million dollars per incinerator. Consequently, if implemented, this policy would shut down about eighty percent of medical waste incinerators. Policy-supporters argued that this proposal would create incentives for hospitals to demand that Baxter reduce the quantity as well as certain types of packaging (Baxter, 1995b). And such demands would

¹⁹¹ In contrast, Lilly markets products that require little packaging. As a result, packaging reduction is almost irrelevant for Eli Lilly.

be in tune with the general concern among health-care providers about managing medical wastes. As Marshall Abbey, former Senior Vice-President, General Counsel, and Chairman of Baxter's Environmental Review Board, noted:

Remember, a large share of Baxter's revenue comes from the sale of disposable medical products. As soon as these products are used, they become waste. And ... waste is becoming a big problem for our customers. So while we are selling products to our customers to satisfy their medical services needs, we are also giving them waste problems. If we are to keep our customers and attract new ones, it is critical that we work to minimize these problems. The future of the company depends on this (Baxter, 1991a: 3).

In similar vein, while addressing the conference on "Our Environment: A Healthcare Commitment," held in Arlington, Virginia, March 10, 1992, Vernon Loucks, Baxter's CEO noted that:

[O]ne of the hospital's biggest opportunity involves managing waste. A 500-bed hospital in the U.S. generates about 1,500 tons of waste each year -- three tons per bed -- and it can spend up to \$350,000 getting rid of it. A teaching hospital of that size typically generates much more waste, and its disposal costs can be well over \$1,000,000. But a hospital can whittle down these disposal costs significantly through aggressive programs to reduce, separate, and recycle waste.

Baxter's ACCESS program has shown that this approach really works the 288-bed Children's Memorial Medical Center in Chicago, saved \$500,000 in waste disposal costs over three years. Another customer, Thomas Jefferson University Hospital in Philadelphia, established a recycling program that produced a \$100,000 savings the first year (Baxter, 1992b: 4).

Another focus of Baxter's efforts to green its products was reducing its use of polyvinyl chlorides (PVCs) for packaging. Like many other firms in the health-care industry,

Baxter uses PVCs to package many of its products. PVCs are plastics derived from mineral oil, natural gas, and rock salt. It is suggested that when incinerated the chlorine in PVCs may produce dioxins. However, there is no statistically proven relationship between the amount of PVCs incinerated and the levels of dioxin produced. Dioxins, the generic name for a group of seventy five chemicals known as chlorinated dibenzo-p-dioxins, are shown to cause cancer in some laboratory animals. As a result, there is immense pressure from environmental groups for regulating, if not banning, the use of PVCs. The medical waste incinerators are considered one of the biggest sources of dioxins, primarily because they incinerate PVCs. The controversy over PVCs created incentives for these customers to demand that Baxter should reduce, if not eliminate the use of PVCs to package its products (Baxter, 1996a).

A similar controversy has been plaguing di-2-ethylhexyl phthalate (DEHP), a plasticizer for PVCs. Some scientists claim that substances such as DEHP that exhibit estrogen mimicry may substantially reduce sperm counts and cause other reproductive problems. A recent book *Our Stolen Future* (Colborn, 1996) argues along similar lines. Again, though there is no conclusive evidence on the impact of DEHP on reproductive issues; nevertheless, there is intense pressure by environmental groups to regulate, if not eliminate, their use. Some European countries such as Germany and Denmark have already taken a position against DEHP. This controversy again creates incentives for Baxter to reduce its packaging and the use of PVC (Baxter, 1996c).

Though the possible enactment of new laws and regulations was critical in creating incentives for Baxter to market green products, normative factors and non-governmental actors also contributed significantly in building support within Baxter for these policies. In

particular, the supporters of policies on green products emphasized Baxter's responsibility as a health-care firm to safeguard the health of the environment. Baxter's CEO Vernon Loucks, almost acting as their chief spokesman, noted:

So there are good business reasons to invest in the environment. There are ethical reasons, as well. Environmental protection lies at the very core of our social duty. Our industry is dedicated to preserving and improving the health of mankind Indeed, our industry has a special connection to life that no other industry shares. But we cannot preserve that trust and uphold that bond if we ignore the environmental consequences of our action. *We cannot fight for life at one moment and destroy it the next. We cannot help those at our front door and harm them by the wastes we send out the back* (1992a: 5-6; italics mine).

I have also suggested an important role for non-governmental actors in encouraging Baxter to market green products. One important way in which such actors exercised influence was by communicating their demands and expectations to Baxter. Actors who supported marketing of green products publicized such communications within Baxter, particularly by getting them published in the in-house environmental newsletter *Baxter Environmental Review*. Let me quote from letters written by three different categories of actors: a household using Baxter's product, a hospital, and an investment firm.

Jim and Sarah Tennessen of Menomonie, Wisconsin, sent this letter to Caremark, a division of Baxter:

Dear Caremark:

I am writing you with a challenge. Caremark has a reputation for innovation and quality. I would like to see Caremark apply this innovation towards

preserving the quality of the planet we live on. I know of no home care provider who has any type of recycling effort in place at this time. I see this as a tremendous opportunity for Caremark to take on an industry role, not only improving the quality of life for its customers, but maintaining the quality of life for all mankind. Caremark, with its home delivery network, is well-positioned to capitalize on this opportunity.

In a single week, our four year old's HPN [TPN] therapy creates approximately six cubic feet of waste, consisting of seven 2,000 ml I.V. bags, three 250 ml lipid bottles, ten line sheets, seven vitamin and sterile water vials, 21 syringes, 24 needles, 16 face masks, 67 alcohol swabs, four split bandages, two gauze bandages, one role of tape, plus all the miscellaneous packaging for these items ... (Baxter, 1991a: 1).

Similarly, Mr. David Baker, Director of Materials Management, St. John Mercy Medical Center, St. Louis, wrote:

One of our employees recently asked our president whether he knew the environmental records of the many vendors we deal with. To that end, we would like to request information from your firm about the composition of the products you sell, the functionality of your products and services -- anything you do environmentally sound. We would appreciate sharing this information with our employees (Baxter, 1991a: 2).

Scott Fenn, Director of the Investor Responsibility Research Center, a non-profit firm representing 400 investment institutions, including many large investment funds, sent a survey to Baxter seeking information:

Has your company introduced or modified any product or service in the last three years specifically to address environmental concerns? Please indicate the nature of the environmental or financial benefits the company hopes to achieve (Baxter, 1992a: 2).

To conclude, Baxter is marketing green products because it could build on its competencies in recycling and packaging reduction, its customers value the benefits of green products for environmental or profit reasons, and customers believe that Baxter's products deliver these benefits. In contrast, Lilly has little business reasons to market green products since most of its products are ethical drugs whose purchases depend on factors such as efficacy and price. These drugs also have small dimensions and hence there is not much scope for reducing their packaging. In addition, these drugs are single-use products that cannot be repaired, reconditioned, remanufactured, or reused.

Since Baxter has not done any investment analysis to justify marketing green products, efficiency-based theories offer little help in understanding Baxter's internal policymaking on this subject. Baxter markets a range of green products and I have explained the adoption of this policy by employing leadership-based explanations. To persuade the organization to market green products, policy-supporters highlighted various benefits of this policy.

First, they emphasized its normative aspects: products of a health-care company should not damage the health of the environment. Second, since many non-governmental actors were asking for information on Baxter's green products and communicating their expectations on this subject, the policy-supporters highlighted the goodwill benefits of marketing green products. Third, and most important, policy-supporters emphasized that marketing green products will eventually be profitable for Baxter since such products provide monetizable savings to customers. As discussed earlier, by emphasizing recycling and packaging reduction as key benefits, Baxter's green products help customers in lowering

their waste disposal costs. Further, these products also proactively reduce PVC incineration.

These benefits are valued by Baxter's customers in light of the EPA's proposal on upgrading air-control standards for medical-waste incinerators. If implemented, this policy would require expensive refitting of such incinerators. Consequently, many of them will shut down and the remaining ones will begin charging much higher prices for incineration. Therefore, the policy-supporters emphasized that the demand for green products will be primarily driven by an unmet need: customers' desire to reduce medical-waste disposal costs. As a result, being green and profitable are mutually reinforcing for Baxter as well as its customers. However, these benefits were not obvious to many managers within the organization. Thus, adoption of policies on marketing green products is best explained by focussing on the role of the policy-supporters who explained the business potential of such products, and as result, generated consensus on adopting such policies.

Table 9.1
Impact of Greening on Customers

	<i>Customers cannot verify greenness of firms' policies or of their products</i>	<i>Customers can verify greenness of firms' policies or of their products</i>
<i>Environmental issues are unimportant in influencing customers' purchase decisions</i>	Beyond-compliance policies such as removing underground tanks do not influence brand choice of customers of anti-depressants or heart valves (Cell 1)	Adopting ISO 14000 does not influence brand choice of customers of anti-depressants or heart valves that are located in the U.S. (Cell 4)
<i>Environmental issues are important in influencing customers' purchase decisions</i>	These situations are unlikely to occur. If firms recognize that customers value greenness, then most of them can be expected to provide credible information on it (Cell 2)	ISO 14000 certification is required for selling in some European countries. Many U.S.-based hospitals buying medical products from Baxter value green attributes of such products (Cell 3)

Chapter 10

Beyond-Compliance: Findings and Conclusions

Overview

In this dissertation, I have examined environmental policymaking within the U.S. operations of two multinational corporations (MNCs): Baxter International Inc. and Eli Lilly and Company. I have explored the internal processes that led them to adopt or not adopt Type 2 policies. I have examined ten cases: four common to these firms (Underground Tanks, 33/50, ISO 14000, and Environmental Audits), and one each specific to them (Responsible Care to Lilly and Green Products to Baxter).¹⁹² These cases pertain to policymaking during 1975 to mid 1996. I have selected these cases to ensure variation on independent variables (factors external and internal to firms). Further, as advised by King et al. (1994), given the small sample size, I have also consciously ensured variation on the dependent variable (policy-adoption or non-adoption). This discussion is summarized in Table 10.1.

[Insert Table 10.1 About Here]

I have classified firms' environmental policies based on two attributes: (1) whether they meet or exceed the requirements of laws and regulations, and (2) whether or not they meet or exceed the criteria specified in investment appraisal procedures. Based on this

¹⁹²Subsequently in my analysis, I treat Internal and External Audits as separate cases. I also treat phase one and two of Responsible Care as separate cases.

classification, I have identified four modal types of environmental policies: Type 1 (those which go beyond compliance and also meet or exceed the profit criteria), Type 2 (those which go beyond compliance but cannot or do not meet the profit criteria), Type 3 (those which are required by laws and also meet or exceed the profit criteria) and Type 4 (those which are required by laws but cannot or do not meet the profit criteria).

Stringent monitoring and enforcement of environmental laws in industrialized countries, particularly the U.S., has ensured that firms and their managers have few incentives to systemically violate these laws. Further, as I have argued elsewhere, MNCs have few incentives to adopt environmentally-inferior technologies in their subsidiaries located in developing countries, or to violate the local environmental laws of these countries (Prakash et al., 1996).

This dissertation has focused only on Type 2 policies. I have examined the puzzle: why firms adopt Type 2 policies at all, and why only selectively? The neoclassical theory suggests that firms' policies directly correspond to external stimuli, whether in the form of governmental regulations or market signals. Thus, it predicts that firms would adopt only those policies that are either required by laws and regulations (Type 3 and Type 4) or that can be demonstrated *ex ante* as being profitable (Type 1).

The neoclassical theory is less useful in explaining why firms adopt Type 2 policies at all, and why only selectively. This is because a *sole* focus on how factors external to firms shape their incentives, *though necessary, is insufficient* to explain this puzzle. For example, as discussed in Chapter 5, only sixteen percent of U.S.-based firms have adopted the Environmental Protection Agency's (EPA's) 33/50 program. Any theory (such as the

neoclassical theory) that focuses exclusively on the coercive character of the EPA (an external factor) as the explanatory variable is therefore under-specified for explaining variations in firms' response to the 33/50 program.¹⁹³ Perhaps, to have a fully-specified explanation, an examination of firms' internal processes and inter-managerial interactions is required. However, since the neoclassical theory treats firms as unitary actors, it offers few theoretical insights to understand this *problematique*.

Given our inability to unbundle firms by employing the neoclassical *theory*, I turned to the new-institutionalist *framework*.¹⁹⁴ This was an ontological departure since actors within firms, and not firms themselves, became my unit of analysis.¹⁹⁵ Note that, both new-institutionalists and neoclassicalists assume methodological individualism. However, since neoclassicalists treat firms as unitary actors, they make no distinction between firms, and individual actors who work within these firms.

Next, I explained the adoption or non-adoption of Type 2 policies based on preferences (policy-supporters versus policy-skeptics) and endowments of actors (specifically, their position in firm's hierarchy) as articulated within: (1) internal institutions and structures of their firm, and (2) the external environment in which their firm functioned.

¹⁹³ To emphasize, such theories are not wrong; they are merely under-specified. By under-specified I mean that as a part of its causal explanation, the neoclassical theory leaves out one or more of the important independent variables. As I have discussed, in the context of beyond-compliance policies, internal processes of firms constitute the omitted variables. In statistical regression models, under-specification means that the additional variability in the dependent variable (adopt or not adopt Type 2 policies in this dissertation) that could have been explained by including omitted variables (internal policymaking processes in this dissertation) now becomes a part of the error term.

¹⁹⁴ I distinguish between a theory and a framework subsequently.

¹⁹⁵ As suggested in Chapter 2, since many scholars of organizational theory view firms as composite actors, a strategy of unpacking of firms is not unique to new-institutionalists.

My strategy therefore had three steps. First, I opened up the “black-box” called the firm. I identified the main actors in the firm’s environmental policymaking, their preferences for Type 2 policies, their position in the hierarchy, and firms’ internal procedures and structures. Second, I linked actors, procedures, and structures to processes of environmental policymaking. By processes I mean two things: (a) the criteria employed by managers for assessing the profitability of projects, including environmental projects and (b) the way in which managers interpret these criteria to support their desired projects, and as a result, how sometimes projects may not be subjected to such formal appraisal procedures. Third, since firms constantly negotiate with the external world, I examined how policy-supporters invoked such external factors to influence internal processes.

As a new-institutionalist, I treat policies of firms as institutions, and firms themselves as organizations. Hence I have examined the adoption or non-adoption of a specific category of institutions: Type 2 policies. Since there are many versions of new-institutionalism, I have drawn upon the version associated with the scholarship of Elinor and Vincent Ostrom, and other colleagues at the Workshop in Political Theory and Policy Analysis (E. Ostrom, 1986, 1990, 1994, 1996; E. Ostrom et al., 1994; V. Ostrom, 1997; V. Ostrom and E. Ostrom, 1977).¹⁹⁶

¹⁹⁶ New-institutionalism encompasses literatures on transaction cost economics (Coase, 1937; Alchian and Demsetz, 1972; Williamson, 1975, 1985), principal-agent (Berle and Means, 1932; Buchanan and Tullock, 1962; Manne, 1965; Fama, 1980; Moe, 1984), property rights (North, 1980, 1990; Libecap, 1989), and more recently, on the role of ‘soft variables’ such as trust and social capital (Roethlisberger and Dickson, 1939; Coleman, 1988; Putnam, 1993; E. Ostrom, 1994, V. Ostrom, 1997).

I view Elinor Ostrom’s scholarship emphasizing two aspects. First, she emphasizes the role of incentives (economic as well as non-economic) in shaping human behavior. Second, she takes into account the role of the nature of goods, the situational variables, and the community rules and norms in influencing these incentives. Importantly, she does not take an atomistic view of actors even though she adopts the tools of a broad rational choice paradigm. Thus, her version retains the theoretical rigor of political

As discussed in Chapter 2, new-institutionalists assume methodological individualism, bounded rationality, and pursuit of self-interest. Given their bounded rationality, managers employ established procedures such as capital-budgeting to assess *ex ante* the profitability of projects, and thereby attempt to maximize shareholders' wealth.

In capital-budgeting, managers project future cash flows emanating from a project, and discount them by the firm's cost-of-capital. Cash flow projections are the best managerial estimates of an uncertain future. To convert issues of uncertainty into issues of risk, managers weight the cash flows by their subjective probabilities. They periodically update probabilities in light of market or regulatory changes. Needless to say, managers' assessments of the future vary substantially. To map out variations in projected profit and cash flows, managers subject these estimates to sensitivity analysis. Thus, managers adopt standard operating procedures to cope with uncertainty, and to establish transparency and impartiality in the project appraisal process. A project is *ex ante* profitable if it meets the criteria of such established procedures. Importantly, *ex ante* profitable projects may result in *ex post* losses if market or regulatory conditions change in unanticipated ways.

Within the new-institutionalist tradition, I have identified three categories of theories on the nature of firms: efficiency-, power-, and leadership-based. Efficiency-based theories suggest that firms are efficiency-enhancing governance structures. Since efficiency-based theories focus on procedural efficiency, they predict that managers would employ procedures that seek to enhance magnetizable profits of their firm. Consequent to employing such

economy, and at the same time, incorporates insights from sociology.

procedures, managers would adopt only those beyond-compliance policies that meet or exceed the monetary profit criteria as stipulated in established procedures of investment analysis. Such policies (Type 1) also meet the objectives of the “green managers” as well as managers emphasizing pursuit of monetary profits.¹⁹⁷ Efficiency-based theories also predict that Type 2 policies will not be adopted.

I have differentiated between substantive efficiency (an attribute of the final outcome) and procedural efficiency (an attribute of the procedures employed to pursue a given objective). Neoclassical theory focuses primarily on substantive efficiency while the efficiency-based theories focus on procedural efficiency. Further, efficiency-based theories examine an important puzzle unanswered by the neoclassical economic theory: why firms arise at all. That is, they seek to explain why and how managers arrive at ‘make or buy’ decisions.

Though efficiency-based theories focus on procedural efficiency, they do not adequately spell out what procedures managers create to ensure that policies meet or exceed profit objectives, and how managers operationalize transaction costs. However, the broad message of efficiency-based theories has been implicitly accepted given that capital-budgeting is a widely accepted procedure of investment analysis. In this dissertation, I have focused on exceptions to this wide-spread practice. As a result, efficiency-based theories are less useful in understanding my theoretical puzzle: why Type 2 policies are adopted at all, and why only selectively?

¹⁹⁷ Thus, the neoclassical theory and efficiency-based theories have similar predictions on this subject.

I have argued that certain managers may think that a given Type 2 policy is beneficial for their firm in the long-run even though its impact on profits cannot be quantified, and thus, such policies cannot satisfy the requirements of established procedures of investment analysis. These managers then face a difficult task of convincing skeptics that this policy should not be subjected to such procedures. In these situations the internal processes of environmental policymaking becomes important. Policy-supporters do not always succeed. Their success, when it occurs, reflects two kinds of processes: power-based or leadership-based.

Power-based theories consider firms as representing the domination of one set of actors over another. They therefore predict that Type 2 policies will be adopted only if they have powerful sponsors such as hierarchically-superior managers.¹⁹⁸ As discussed in Chapter 8, some of Baxter's managers opposed inviting Arthur D. Little (ADL) to help them define state-of-the-art environmental standards, and to audit Baxter's environmental programs against these standards. Interventions by very senior managers including Baxter's Chief Executive Officer, ensured that such objections were over-ruled. Consequently, this policy was adopted by imposition.

Leadership-based theories suggest that efficiency- or power-based explanations cannot fully explain the nature of firms. They suggest that firms emerge only through the intervention of leaders who can convince other managers to reassess their assumptions and

¹⁹⁸ Theoretically, there is another policy category: Type 1 policies that were not adopted due to the opposition from powerful actors. This theoretical category has little practical relevance since senior managers, whose compensation is often linked to the profits and the stock price of the firm, will have few incentives to oppose such policies. I could not find instances of such opposition in Baxter or Lilly.

preferences regarding the costs and benefits of collective action. Hence, firms' policies carry imprints of such leaders; firms would not have adopted them in the absence of leaders' interventions. As suggested in my discussions of Underground Tanks, the 33/50 programs, and Responsible Care (Chapters 4, 5, and 6), such Type 2 policies are initially opposed by some managers since they do not meet the formal profit criteria. Overtime, however, policy-supporters succeed in convincing policy-skeptics that these policies indeed serve long-term interests of their firms, although their profit contributions cannot be quantified. Such policies are eventually adopted by inducing consensus.

Importantly, Type 2 policies that are adopted by power- or leadership-based processes are portrayed by their supporters as increasing firms' long-run profits. This is expected since the main objective of firms is the pursuit of profits. It is difficult to visualize that policy-supporters would urge their firms to adopt policies that harm the firms' long-term interests.¹⁹⁹ Note that although the policy-supporters claim increases in long-term profits, they provide no estimates. This suggests that in some instances profit no longer remains an "objective" concept whose assessment is invariant across actors. I am not arguing that established methods of project appraisal are irrelevant. They are indeed relevant and that is why it is difficult for the supporters of Type 2 policies to justify why their pet policy should

¹⁹⁹ My argument is that *ex ante*, profits are mere projections. Of course, by considering alternative scenarios (through sensitivity analysis), managers endeavor to make more rigorous projections, a task that has been greatly facilitated by computer packages such as Lotus. On a lighter note, I can testify from my own experience at Procter and Gamble that such technological advances have created headaches for junior managers who are often asked by senior managers to "play around a bit with numbers."

In some instances, sole reliance on formal assessment procedures is not useful since it is not possible to quantify the profit impact. This creates opportunities for managers who claim to have a "vision" to push through their pet projects. These policies are implemented if either such managers are able to convince others that such projects help the firm in the long-run (leadership-based processes) or if they have the authority to impose their "vision" on others (power-based processes).

not be subjected to established project appraisal procedures. It is noteworthy that such exceptions do occur. In this dissertation I have made a modest attempt to understand the processes that lead to such exceptions.

To summarize, efficiency-based theories predict that managers employ some “objective” criteria to assess the profitability of policies. Thus, profitability would be assessed *ex ante*, and only policies meeting or exceeding this criteria would be adopted. This dissertation suggests that in the context of Type 2 policies, managers cannot or do not employ such well-defined criteria. For example, it is difficult to assess the profitability of environmental audits that do not require up-front capital-expenditure and that do not generate revenues (Chapter 8). Further, even in some circumstances (such as Underground Storage Tanks, Chapter 4; the 33/50 program, Chapter 5) that involved significant capital expenditures, policy-supporters succeeded in not employing established appraisal procedures.

If policy-supporters succeed, then is through two broad routes: (1) they convince the top-management of the net benefits of such policy and have it mandate the policy's adoption; (2) they convince policy-skeptics to revise their assessments of its net benefits. In both these strategies, policy-supporters emphasize that the policy will enhance firm's profits in the long-run, although they provide no quantifiable estimates of such profits.

An important policy implication then is that a focus on “win-win” projects that are projected to generate profits and deliver superior environmental performance (Porter, 1990; Porter and van der Linde, 1995) as a pillar of environmental policies is misplaced. Win-win strategies assume that firms can earn monetizable profits by adopting environmentally-

progressive policies. Certain projects (Type 1 policies) certainly fall in this category, especially the ones that lead to pollution-prevention or reduction. However, other Type 2 policies such as adopting new management systems can seldom be demonstrated as being *ex ante* profitable.

Theoretical Implications

Research objectives often fall in the realm of either theory-testing or theory-building. Theory-testing is useful when the existing theoretical tools are sufficient to examine a given puzzle. Of course, in the process of testing existing theories, researchers may suggest modifying them.

Theory-building is useful when existing theoretical tools are insufficient in explaining a given puzzle. For example, I classify Coase's 1937 landmark article as being in the realm of theory-building since the neoclassical economic theory did not sufficiently explain major puzzle: why do firms arise in the first place? This dissertation could also be viewed in the realm of theory-building. Existing theories, both the neoclassical theory and efficiency-based theories within the new-institutionalist tradition, inadequately explain why firms adopt Type 2 policies at all, and why only selectively. I have therefore employed three types of theories that together explain this puzzle. However, this is only an initial step in developing better theory to understand this puzzle. I have attempted to understand the notion of efficiency by differentiating between substantive efficiency and procedural efficiency. I have argued that to examine intra-firm processes and inter-manager interactions, procedural efficiency is more appropriate. As a second-round effect, substantive efficiency is predicted

to impact procedural efficiency. However, this impact is mediated by a variety of institutions such as competition in the market as well as managerial abilities to learn from such market signals.

My dissertation has three theoretical implications. First, ontologically, I make an argument in favor of methodological individualism: the policies of composite actors should eventually be traced to preferences, endowments, and strategies of individual actors, as articulated within internal institutions of firms. Second, I suggest that many social phenomena such as corporate responses to beyond-compliance policies cannot be adequately understood by employing one theory; rather this requires employing multiple theories and a common framework to link them. Third, I make an argument for “bringing back leadership” to political economy since leaders often play crucial roles in institutional evolution and change. I elaborate on these implications below.

Composite actors

The neoclassical theory treats firms as undifferentiated unitary actors responding only to external factors. This spartan view of the firm serves well to predict firms’ responses to Type 3 and Type 4 policies (both are required by laws) and Type 1 policies (that meet or exceed the requirements of capital-budgeting) but not Type 2 policies.

Then how do we explain the selective adoption of Type 2 policies? There are two strategies, both sacrificing parsimony to increase the explanatory power of the theory. The first strategy is to view firms as differentiated unitary actors, and not as undifferentiated unitary actors. With this additional assumption, one could argue that differentiation across

firms makes them respond differently to the same external stimulus. Note that we continue to treat firms as unitary actors. The second strategy is to treat firms as differentiated composite actors and focus on their internal processes. One could then argue that the differences in internal processes explain variations in responses to Type 2 policies. I elaborate on these two strategies below.

In employing the first strategy, firms could be differentiated on the basis of a variety of indicators such as assets and sales (large firms versus small firms) or industry type (engineering firms, chemical firms, electronic firms, etc.). As discussed in Chapter 1, UNCTAD's benchmark survey on the environmental practices of MNCs reports that the environmental programs of MNCs are a function of three factors: size of the firm, nationality of the parent firm, and industry type (UNCTAD, 1993). For example, this survey reports that larger MNCs (with sales above \$4.9 billion) have stronger environmental programs than smaller MNCs.

A strategy of treating firms as differentiated unitary actors is considerably superior to one that treats them as undifferentiated unitary actors. Such differentiation based on their external attributes enhances the power of theory in explaining why firms with given attributes tend to adopt specific kinds of environmental programs. In effect, by diluting parsimony, our theoretical tools have gained superior explanatory and predictive power.

However, we still cannot explain why, in response to the same external stimulus, firms sharing similar attributes, adopt different policies. For example, while Baxter and Lilly share characteristics identified in the UNCTAD survey, they have responded differently to the demands of environmental groups for transparency in their environmental programs.

Baxter invites external auditors to evaluate its environmental programs whereas Lilly does not (Chapter 8).

Further, we are unable to explain why a given firm responds differently to similar external stimuli. For example, Lilly has responded differently to the adoption of industrial codes of practices; it has adopted Responsible Care (Chapter 6) but not adopted ISO 14000 (Chapter 7).

What is the next step? One strategy could be to make the classification of firms' attributes more complex. However, there is no theoretical reason why this additional complexity will improve the theory's explanatory power.²⁰⁰ Perhaps, a paradigmatic shift is required to shift the focus of inquiry from firms' external factors to their internal ones. This requires employing the second strategy of unbundling firms; treating them as differentiated composite actors, and not as differentiated unitary actors.²⁰¹ As I have argued, this calls for revising the ontological assumptions: instead of treating firms as units of analysis, the focus shifts to individual actors within firms as units of analysis.

We now seek to examine inter-manager interactions, particularly between policy-supporters and policy-skeptics. This should explain: (1) in response to the same external stimulus (such as stakeholder scrutiny), why some firms adopt certain Type 2 policies, while others do not (only Baxter invites External Auditors); (2) in response to similar external

²⁰⁰ I take the view that any classification must have a theoretical basis: we must have a logic to classify in the manner that we do. Of course, one could observe patterns and infer theoretical reasons why such patterns arise. However, such explanations are under-specified in that there could be multiple reasons for the same pattern. To this extent, I do not adopt this approach.

²⁰¹ Conceptually, there is one more category: firms as undifferentiated composite actors. This assumes that firms are staffed by identical employees who function in identical internal institutions. Since this category has little practical relevance, I do not elaborate on it.

stimuli (for example, industrial codes of practice), why the same firm adopts different policies (Lilly adopts Responsible Care but does not adopt ISO 14000)? I have argued that such inter-manager interactions could be dissimilar across firms, and within the same firm due to a variations in firms' internal institutions, levels of opposition of policy-skeptics (specifically, the “losers” from changes in collective-choice level institutions), the hierarchical power of policy-supporters in relation to policy-skeptics, the credibility and persuasive abilities of policy-supporters in rallying policy-skeptics, and the managerial perceptions of coercive power of the external institutions that are encouraging or discouraging adoption of a given Type 2 policy.²⁰²

Multiple Theories and Common Framework

The second theoretical implication of this dissertation is that explaining social phenomena (Type 2 policies in this dissertation) often requires multiple theories linked by a common framework. Before I expand on this subject, let me differentiate a theory from a framework.²⁰³ According to Elinor Ostrom:

A framework helps to identify the elements and relationships among these elements that one needs to consider for institutional analysis ... they organize diagnostic and prescriptive enquiry ... provide a metatheoretical language to compare theories ... attempt to identify universal elements that any theory relevant to the same kind of phenomena would need to include (1996: 4).

²⁰² Subsequently, I elaborate on the important role of external factors in influencing internal dynamics.

²⁰³ The distinction among a framework, a theory, and a model is emphasized in the literature on the Institutional Analysis and Development (IAD) framework that has been developed by the scholars at the Workshop in Political Theory and Policy Analysis (E. Ostrom, 1990; E. Ostrom et al., 1994).

In contrast, theories help analysts to specify elements of a framework that are relevant to a given puzzle. Elinor Ostrom notes that:

[T]heories focus on a part of a framework and make specific assumptions that are necessary for an analyst to diagnose a problem, explain its sources, and formulate some solutions. Several theories are usually compatible with any framework (1996: 5).

In this dissertation, I employ three sets of theories linked together within a new-institutionalist framework. All these theories view institutions as potential artifacts.²⁰⁴ However, they differ in their explanations of how and why institutions emerge. No theory alone can explain all aspects of my puzzle.

Efficiency-based theories predict that Type 2 policies would not be adopted (as in ISO 14000 for Baxter and Lilly). In contrast, power-based theories predict that Type 2 policies would be adopted if policy-supporters have sufficient coercive power to over-rule policy-skeptics. Thus, such policies may be adopted without changes in dissenters' preferences.²⁰⁵ In contrast to power-based processes, leadership-based policies involve

²⁰⁴ Some of these theories may be compatible with other frameworks as well. For example, power theories are compatible with the Marxian framework. Ontologically, the Marxian framework assumes class, and not the individual, is the unit of analysis. As a result, the Marxian framework does not explicitly address collective action dilemmas. The Marxian framework also does address bounded rationality and opportunism.

²⁰⁵ I disagree with scholars who suggest power-based explanations are preeminent, and leadership is only a subtle exercise of power. Later in this chapter, along with this issue, I discuss my strategy to infer whether or not policy-skeptics have changed their preferences.

changes in preferences.²⁰⁶ Such policies bear the imprints of particular leaders who employ their persuasive skills to convince policy-skeptics of the long-term payoffs of adopting Type 2 policies. Overtime, in some instances, policy-skeptics change their preferences, and such policies are then adopted consensually.

Do these theories constitute alternative explanations; that is, do they suggest different logics for understanding a given phenomenon? If so, then do we need to prioritize these theories? Prioritizing can have two meanings. First, I could rank these theories on their explanatory and predicatory powers. I do not do this since I see them as working together to explain a broader puzzle. Second, I could prioritize these theories in terms of the chronology of my enquiry. I have followed a particular format in my analysis of the ten cases. I have first employed efficiency-based theories for understanding the adoption or non-adoption of particular policy. This is because it is generally assumed that the preeminent objective of firms is pursuit of profits. Since efficiency-based explanations could not explain the selective adoption of Type 2 policies, I then employed leadership- and power-based explanations.²⁰⁷

The new-institutionalist framework views power- and efficiency-based theories as complementary, and not as competing explanations. This is a major achievement since scholars of political economy often subscribe either to an “efficiency-based” or to a “power-based” perspective. In environmental policy discourse, this gulf manifests itself as debates

²⁰⁶ This, in turn, requires an assessment of preference intensity. My strategy has been to examine the extent of organizational change and thereby assess the perceived “loss” of “losers” from such changes. If the loss is significant, then losers can be predicted to exhibit strong preferences for not adopting Type 2 policies, and would therefore have few incentives to revise their preferences. As a result, if such policies are implemented at all, then it would be through power-based processes.

²⁰⁷ If I were analyzing a different phenomenon, I may have first looked for power-based or leadership-based explanations.

on the relative merits of “the state” (with a focus on politics, and thereby on power) and “the market” (with a focus on economics, and thereby on efficiency). In international relations, there is an ongoing debate between the neorealists and the neoliberal-institutionalists. Employing a power-based perspective, the neorealists claim that the anarchical nature of world politics encourages states to focus on maximizing their *relative* gains from any cooperative endeavors. As a result, enduring cooperation among states is not possible (Waltz, 1979; Grieco, 1988). In contrast, the neoliberal-institutionalists claim that enduring cooperation is indeed possible since states focus on *absolute* gains from such endeavors (Keohane, 1984; Snidal, 1991).²⁰⁸

Since both power-based and efficiency-based perspectives add to our understanding of social phenomena, why should there be an insistence that one perspective must always prevail? Why not view these perspectives as complementary that together can help us to understand complex social reality. In this regard, the distinction between a framework and a theory is a major theoretical breakthrough. Theories and frameworks constitute two different levels of theoretical inquiry. Often by focusing on the incorrect level of analysis (the level of theory) we find ourselves in midst of unnecessary contestations on the superiority one theory over another. An understanding of why firms adopt or do not adopt beyond-compliance policies would have been incomplete had I employed only efficiency-based or power-based theories. On this count, new-institutionalism is particularly attractive in that in it allows both efficiency-, and power- based perspectives to flourish, and thereby

²⁰⁸ An excellent collection of the major articles in this debate can be found in Baldwin (1993).

encourage scholars in the increasingly divided discipline of political economy to find commonalities.²⁰⁹

Leaders Matter

New-institutionalists assume methodological individualism implying that all actors are ontologically equal; it does not imply that all individuals are alike. Individuals differ in their preferences, their access to resources, their abilities to employ such resources, and their capacities to influence outcomes.²¹⁰ Some individuals have greater capacities and willingness to influence institutional evolution in favor of Type 2 or other policies. As suggested in the discussion on Underground Storage Tanks (Chapter 4), the 33/50 program (Chapter 5), and Responsible Care (Chapter 6), such leaders demonstrate capacities to convince policy-skeptics to revise their assessments of the long-term benefits of Type 2 policies.

I do not view power-based processes reflective of leadership. Structurally-advantaged individuals such as hierarchial-superiors may force the adoption of Type 2 policies. However, such interventions do not lead policy-skeptics to revise their assessments of Type 2 policies. As discussed in Chapter 8, even recently I observed continued opposition in

²⁰⁹ I am not asserting that all scholars agree with the basic assumptions of new-institutionalism. For example, some scholars consider new-institutionalism equivalent to rational-choice institutionalism. As discussed in Chapter 2, rationality implies that human behavior is consequence-governed, and that actors estimate their costs-benefits prior to action. In contrast, many scholars view human behavior to be rule-governed (March and Olsen, 1989; Sandholtz, 1997). Still, others give primacy to ideas and discourses in shaping human behavior. For them, preferences are socially constructed, not autonomous. Further, ideas are not viewed as intervening variables. For an excellent review of this debate, see E. Ostrom (1991).

²¹⁰ Similarly, in international relations, states are viewed as juridically equal although they are located differently in the international structure (Waltz, 1979). As a result, some states are more "powerful" than others.

Baxter to external audits by Arthur D. Little (ADL).²¹¹ Similarly, though a senior manager held up the implementation of the Community Outreach Program under the aegis of Responsible Care in Lilly (Chapter 6), policy-supporters did not give up their efforts. After about eighteen months, once the policy-skeptic retired, policy-supporters could have Lilly implement community outreach programs

A focus on leadership is also helpful in strengthening the dialogue between political economy and organizational theory. Though both political economists and organizational theorists study collective action, their intellectual agendas appear to have drifted apart. Political economists tend to study the dynamics between politics and economics. A study of politics is often (incorrectly) equated to the study of governments, and a study of economics to the study of markets. Consequently, the intellectual arena for many political economists is limited to studying two institution types: markets and governments. Some political economists, especially Public Choice scholars, tend to employ the tools of economics to study politics. On the other hand, organizational theorists tend to employ the tools of sociology. Sociologists also tend to focus their study less on markets. Due to differences in methodological tools and research focus, the level and quality of dialogue between economists and sociologists leaves much to be desired. This drift is unfortunate since both political economists and organizational theorists study collective action, they have much to

²¹¹ The ADL consultant was more anxious about his presentation to the Divisional Environment Managers (DEMs; policy-skeptics) than to the Environmental Review Board which is the highest decision-making body on environmental issues. After attending his presentation to the DEMs, I better appreciated his reasons for being anxious; some DEMs continue to oppose external audits by ADL. Hence, I infer that though external audits have been mandated by senior-management, many DEMs have not revised their preferences against them.

contribute to each other. New institutionalism, especially the Ostrom version, combines insights (at least) from political science, economics, and sociology. Therefore, it has the potential to initiate a dialogue between organizational theory and political economy. Since leadership is a highly researched subject in organizational theory, this is one area where such cross-pollination can begin.

Does studying leadership imply that our research will become focused on examining preferences and strategies of leaders, and not of “ordinary folks”? If so, then will it distort our understanding of social processes? Such debates have reverberated in other contexts as well. For example, historians such as Ambrose (1967) emphasize the role of leaders, while others such as Zinn (1995) and Appleby et al. (1994) emphasize contributions of popular movements.²¹² In international relations, Realists such as Morgenthau (1978) and Kissinger (1964) emphasize the role of leaders in shaping foreign policy.²¹³ In their study of the Indian Freedom movement, historians such as Majumdar et al. (1958) focus on the contributions of Gandhi, Nehru, Bose, and other stalwarts, while ‘subaltern historians’ emphasize the role of popular movements (Sarkar, 1989).

Clearly, for studying social processes at the firm- or country-level, one needs to examine the contributions of both leaders and “ordinary folks,” as well as the structures within which they operate. Political economists focus on structures (with their emphasis on institutions) as well as ordinary folks (an implication of methodological individualism).

²¹² I thank Cynthia Yaudes for this point.

²¹³ Further, the “second-image” scholars (Katzenstein, 1978; J. Hart, 1992) emphasize domestic factors and the “third-image” scholars including neorealists (Waltz, 1979; Grieco, 1988) and world-system theorists (Wallerstein, 1979) emphasize structural factors.

Some scholars also examine the roles of structurally-advantaged actors in shaping social processes, and I have termed such explanations power-based theories (Marx and Engels, [1848] 1960; North, 1990; Libecap, 1989; J. Knight, 1992). However, leadership (the ability to induce consensus without coercion) seems to be a relatively neglected area in the study of political economy.²¹⁴

Would introducing leadership as a key variable in political economy lead to elitist explanations of social processes? I think such concerns are unwarranted as we are interested in understanding the phenomenon of leadership, and how it impacts certain situations. There is no assertion that only certain types of people can display leadership. What is important is that leadership may influence the organization and form of collective action, whether in small self-governing communities or in global corporations.

Policy Implications

In this dissertation I have examined an important policy issue concerning firms' responses to environmental issues. It is often believed that firms are the main agents of environmental degradation, firms cut corners to save on environmental costs, and as a result, there is an inherent conflict between environmental sustainability and firms' objectives. In this dissertation, I have challenged the simplistic notions that suggest that firms will invariably adopt policies that minimize the costs borne by them.²¹⁵

²¹⁴ Notable exceptions are Miller (1992) and Calvert (1987).

²¹⁵ Though I have not reviewed the literature on the concept and operationalization of environmental sustainability, some scholars suggest that adoption of beyond-compliance policies is perhaps an initial step in that direction (Gladwin et al., 1995).

Two policy implications flow from this dissertation. First, factors external to firms (and these could be influenced by policymakers) may have critical, though *not deterministic*, influence on environmental policy processes within firms. Second, firms often adopt those Type 2 policies that require fewer changes in their internal organizations and institutions, especially at the collective-choice level. This has important implications for policy design, again a variable that could be manipulated by policymakers. I discuss the two implications below.

Role of External Factors

As discussed previously, in contrast to the neoclassical theory that places *exclusive* emphasis on external factors, I have emphasized the importance of *both* internal processes and external factors in influencing whether or not firms adopted Type 2 policies. External factors influence the “rules” and “norms” (Crawford and Ostrom, 1995) within which firms conduct their business.²¹⁶ Importantly, external factors may also directly influence managerial behavior. For example, individual managers in U.S.-based firms can face civil and criminal prosecution for environmental violations by their firms.²¹⁷

Previously, I have classified environmental policies as compliance-driven (Type 3

²¹⁶ Unlike norms, rules specify the penalties for violation (Crawford and E. Ostrom, 1995).

²¹⁷ Another example could be the influence of the market for managers on managerial behavior. Manne (1965) suggests that since managers may change their employers, there exists a market for managers. This market evaluates managers on their performance, and as a result, creates incentives for individual managers to behave in particular ways. At Procter and Gamble, I encountered numerous situations where marketing managers were asked to substantiate their contributions to new marketing initiatives. Thus, marketing managers had incentives to launch large numbers of new initiatives even if such initiatives hurt the other objectives of their organization.

and Type 4) or as beyond-compliance (Type 1 and Type 2). I have argued that external institutions (laws and regulations in our case) alone are sufficient to predict firms' response to compliance-driven policies. However, external factors may also influence adoption or non-adoption of Type 2 policies by impacting firms' internal policy processes. As suggested in Table 10.2, if managers perceive external factors which encourage a given Type 2 policy as significant in shaping their firm's business environment, then policy-supporters have greater *incentives* to mobilize internal coalitions. Further, since efforts of policy-supporters have greater *credibility* among policy-skeptics, there is a greater likelihood that internal coalitions in support of a given Type 2 policy will emerge.²¹⁸

Of the six Baxter's policies I have examined, five have been adopted (Underground Tanks, Green Products, 33/50, Internal, and External Audits). In three of the five adopted policies, Baxter's managers perceived external actors as important and encouraging policy adoption (Underground Tanks, Green Products, and 33/50). External factors were perceived as important but discouraging the adoption of policies for Internal and External Audits. Baxter did not adopt ISO 14000, primarily because managers considered external factors encouraging this policy to be relatively unimportant.

Similarly, of the six Lilly's policies I have examined,²¹⁹ four were adopted

²¹⁸ In international relations, it is suggested that wars and external threats are a crucial factor in nation-building (Russett, 1993). In response to external threats, domestic actors tend to temporarily de-emphasize their differences, and forge a united front against a common external enemy.

²¹⁹ I have not examined Lilly's response to green products. As discussed in Chapter 9, since Lilly manufactures and markets ethical drugs, green products are not a relevant business category for it. Interestingly, this is an example where external factors (doctor prescribing ethical drugs) are important but not supportive of policies of marketing green drugs. As a result, there are few incentives and opportunities for green managers within Lilly to build internal coalitions to advocate the adoption of policies on manufacturing and marketing green ethical drugs.

(Underground Tanks, 33/50, phase two of Responsible Care, and Internal Audits). In three of these four policies, external factors were perceived as significant and encouraging policy adoption (Underground tanks, 33/50 and phase two of Responsible Care). For Internal Audits, external factors were considered important but discouraging policy adoption. Lilly did not adopt ISO 14000, since external factors were considered relatively unimportant.

[Insert Table 10.2 About Here]

To elaborate, both Lilly and Baxter adopted the 33/50 program primarily because its sponsor, the EPA, had the capacities to significantly influence these firms' business environments. Consequently, EPA's sponsorship facilitated the emergence of internal coalitions (leadership-based policy). Even though 33/50 was a voluntary program, its supporters within Baxter and Lilly argued that its adoption was necessary for their firms to remain in the good-books of the EPA. Thus, the perception among managers of the coercive character of the EPA created incentives for policy-supporters to rally policy-skeptics within their firms, and imparted credibility to their actions.²²⁰

Leadership-based processes also explain Lilly's and Baxter's adoption of Type 2 policies on replacing Underground Tanks. Policy-supporters within these firms stressed that

²²⁰ However, not every US.-based firm perceived the EPA being sufficiently coercive, or their adoption of this program as being sufficient to get into the good-books of the EPA. As a result, only 16 percent of firms releasing TRI chemicals have adopted the 33/50 program. The supporters of this policy within Lilly and Baxter were successful because they were able to sensitize their colleagues that the EPA is indeed coercive. For this, they invoked their firms' experiences with the EPA in the late 1980s. Further, they managed to convince the policy-skeptics that adopting 33/50 program will create substantial goodwill for their firm within the EPA.

even a single leak from an underground tank could seriously harm their firm's reputation, and thereby inflict substantial financial damage. The coercive character of the U.S. legal system, particularly the award of punitive damages, was important in rallying support on this policy. In addition, policy-supporters stressed that Lilly must ensure that communities living in the vicinity of its facilities perceive Lilly as a responsible and trustworthy corporate citizen. As discussed in Chapter 4, nearly 90 percent of Lilly's tanks are located in its Tippecanoe and Clinton facilities in Indiana. Previously, there had been unsubstantiated complaints that leakages from underground tanks contaminated the region's aquifers. Hence, the local communities (external factor) needed reassurance that Lilly's storage tanks did not leak; installing expensive above-the-ground tanks (Type 2 policy) enabled visitors to Lilly's facilities to visually inspect the storage tanks.

In part, Lilly's enthusiastic support for Responsible Care can be attributed to its desire to be a major player in the Chemical Manufacturers Association (CMA). As discussed in Chapter 6, Lilly is a show-case example of the successful implementation of CMA's Responsible Care program. Since the CMA has an important voice on policies impacting the chemical industry, the major players within the CMA have opportunities to pursue their firms' agenda under its aegis. Thus, policy-supporters highlighted the significant payoffs of adopting Responsible Care in terms of having credibility with CMA member firms, and thereby acquiring the ability to influence CMA's agenda.

In my discussion of Green Products (Chapter 10), I argued that the nature of the business portfolio (an external factor) is critical in influencing policies on the manufacturing and marketing of green products. Consequent to EPA's proposal on air-quality standards, and

the rising costs of disposing wastes, Baxter's customers began talking about packaging reductions, and reducing PVCs. Thus, supporters of green products argued that Baxter had important business reasons to be proactive, and to consider marketing products that offer environmental benefits as a distinctive product offering. In contrast, since Lilly manufactures and markets ethical drugs, its customers (doctors) potentially have little interest in the greenness of drugs; they look for attributes such as efficacy, cost of treatment, and availability. Hence, for doctors, the greenness of Lilly's products and corporate policies are 'hygiene' factors (their absence may dissuade them from prescribing Lilly's products), but not 'motivators' (their presence may not persuade them to prescribe Lilly's products).²²¹

Policy-supporters faced a difficult task if policy-skeptics did not consider the external factors to have the abilities to impose significant excludable costs or to offer significant excludable benefits. Lilly's and Baxter's wait-and-see policies on ISO 14000 (at least, until mid 1996) were partially due to the non-coercive character of the International Organization for Standardization, the sponsor of ISO 14000.²²² The policy implication is that ISO 14000 must provide excludable benefits or impose excludable costs on firms and their managers. For example, if the EPA lends visible support to ISO 14000 standards, then

²²¹ Greening can occur at the level of the firm as well as the level of the product; and one may not always lead to the other. Hence, an important policy implication is what kind of greening should be encouraged. For example, as discussed in Chapter 3, the General Agreement on Tariffs and Trade (GATT), now the World Trade Organization (WTO), allows countries to subject its imports to product standards but not process standards. On this count, the institutions of GATT create incentives for the greening of products, but not of corporate management systems. On the other hand, if ISO 14000 certification becomes a *de facto* requirement for exporting to the European Union, then firms will have incentives to green their management systems.

²²² As discussed in Chapter 7, significant investments are required in the establishment and certification of ISO 14000 systems.

perhaps U.S.-based firms may consider ISO 14000 more seriously. However, the EPA's stand against granting attorney-client privilege to environmental audits (and ISO 14000 involves such audits), makes ISO 14000 even less attractive to U.S.-based firms.

My discussion on environmental audits offered yet another perspective on the influence of external factors on intra-firm dynamics. As discussed in Chapter 9, many states have passed laws that encourage firms to undertake self-audits. The EPA ostensibly supports self-audits. However, it vehemently opposes granting of the attorney-client privilege to information gathered during such audits, and thereby actually discourages self-audits. Given the coercive powers of the EPA, external factors appear to discourage firms from undertaking audits. However, both Lilly and Baxter have established internal audit programs. How does one explain this anomaly? Policy-supporters successfully portrayed audits as tools to facilitate compliance and to improve environmental management systems. They contended that since their firms were committed to comply with or exceed the requirements of all applicable laws and regulations, the firm had nothing to fear from audits. And if there were instances of unintentional violations (the assumption being that there are not intentional systemic violations), then firms would rather report themselves, and correct them as soon as possible. Further, policy-supporters perceived that in the long-term, the EPA and other external actors that opposed such audits will realize that firms are really not misusing them, and will therefore begin to view audits more favorably. As a result, proactively establishing internal audit organizations and institutions will have long-term payoffs.

Demythologizing Beyond-Compliance

One of my findings is that if policy-supporters perceive that external organizations encouraging a Type 2 policy can impose excludable costs or provide excludable benefits, then it becomes easier for them to convince policy-skeptics. In the case studies, I have described how the managerial perception of the coercive character of the EPA enabled policy-supporters to argue in favor of adoption of Type 2 policies. Adoption of Type 2 policies appears to have been encouraged by existing regulatory regimes. Thus, existing compliance standards seem to set the base level upon which beyond-compliance initiatives took place.

It can also be argued that firms undertake beyond-compliance initiatives primarily to preempt even more stringent regulations or to shape future regulations. To some extent this is true since one of the key arguments employed by policy-supporters was that to remain a credible player in the environmental policy discourse, their firms needs to adopt Type 2 policies. However, one needs to be careful in attributing adoption of *all* Type 2 policies to such motivations. Firms face collective action dilemmas in adopting Type 2 policies; only concerted action by firms can potentially ward off tougher regulations or shape future regulations. Thus, the preemption argument may hold for industry-level initiatives such as Responsible Care and ISO 14000 that explicitly seek to preempt stringent regulations. As discussed in Chapter 2, by converting goodwill for firms among regulators and other external actors from a public good to a club good, industry-level initiatives mitigate collective action dilemmas. As a result, firms have greater incentives to adopt such Type 2 policies.

Organizational Change

This dissertation suggests that Type 2 policies requiring significant organizational change are less likely to be adopted by leadership-based processes. By creating new institutions and structures, or by reallocating responsibilities within existing structures, organizational changes upset the status-quo; actors who “lose” from such changes have incentives to oppose them. If the organizational changes required to implement such a policy are “significant” (see below), then it becomes difficult to pacify the losers without diluting the integrity of the proposed policy. As summarized in Table 10.3 below, policies requiring significant changes may not be adopted by leadership-based processes since it is difficult to induce losers to cooperate. If they are adopted, then they reflect power-based processes whereby structurally powerful policy-supporters were able to impose their will on policy-skeptics. Though policy-skeptics remain dissatisfied, they are forced to accept the new policy.

Of the six Baxter's policies I have examined, organizational changes were significant only for Environmental Audits -- both Internal and External Audits. As a result, Type 2 policies on Internal and External Audits were adopted by power-based processes. Organizational changes were less significant for the other four, three of which were adopted by leadership-based processes (Underground Tanks, 33/50, and Green Products); one which was not adopted (ISO 14000).

Of the six Lilly's policies I have examined, organizational changes were significant in two of them (External Audits and phase one of Responsible Care). Consequently, these policies were not adopted. Organizational changes were less significant for the other four policies, three of which were adopted by leadership-based processes (Underground Tanks,

33/50, and the second phase of Responsible Care); and one which was not adopted (ISO 14000).

[Insert Table 10.3 About Here]

Whether or not institutional changes are significant requires examining the nature of the institutions. As discussed in Chapter 2, the IAD framework identifies three nested levels of institutional analysis: operational-, collective-, and constitutional-choice (Kiser and Ostrom, 1982). Constitutional-choice level changes are the most difficult to implement while operational-choice level changes are the easiest. This is because constitutional-choice level changes alter the “status quo” most significantly since all future collective choice decisions would be affected by such changes. Consequently, they create incentives for “losers” to tenaciously resist them. As discussed in Chapter 8, in the early 1990s, Baxter established environmental auditing organizations and institutions, and invited Arthur D. Little (ADL) to define state-of-the-art standards. This action deprived Baxter's facility managers of a crucial voice in defining environmental standards. As a result, they opposed the concept of state-of-the-art standards, and the invitation to ADL to define them. Such collective-choice level changes are adopted only if their supporters are hierarchical superiors having the abilities to ignore opposition. Baxter's policy had vocal and decisive support from Vernon Loucks, Baxter's Chief Executive Officer, and Marshall Abbey, Chairman of Baxter's Environmental Review Board who virtually mandated the adoption of this policy.

In contrast, Lilly's policy on Internal Audits did not ignite internal opposition since

it did not upset the status quo. Unlike Baxter, Lilly defined its auditing standards internally with contributions from both corporate and facility managers. In the early 1990s, Lilly employed environmental audits primarily as a compliance tool, and only in recent years, have they been employed to evaluate management systems as well. Note that such changes in management systems create conflicts if they alter organizational structures or reallocate functional responsibilities. In contrast to Lilly, Baxter did not adopt such an incremental policy on audits; rather the compliance and management systems aspects were emphasized from the very beginning.

Operational-choice level decisions do not significantly impact inter-manager interactions since they do not initiate new policies, and they only marginally reallocate responsibilities among existing managers. As a result, they do not create significant losers. This is an important reason why the Underground Storage Tank program (Chapter 4) and the 33/50 program (Chapter 5) in Baxter and Lilly, and the marketing of Green Products in Baxter (Chapter 9), met with little internal resolute opposition. Since these programs did not require creating new permanent structures (although, implementation committees were formed in both these firms), they did not redistribute responsibilities or budgets within these firms. As a result, managers did not feel professionally threatened, and had little incentives to tenaciously oppose them.

On the other hand, at first, some of Lilly's managers strongly opposed Responsible Care, especially its Code on Community Awareness and Emergency Response (Chapter 6). This Code required that firms develop Community Outreach Programs. The policy-skeptics argued that Lilly had little reason to share information on its manufacturing operation since

it adhered to all applicable laws and regulations. Further, communities in the vicinity of Lilly's facilities had little knowledge with which to appreciate the technicalities of manufacturing processes. A sharing of technical information with such communities may lead them to make unwarranted conclusions about the safety aspects and environmental impacts of facilities' operations. Opposition to Responsible Care stemmed from the requirement for Lilly to change its policy (collective-choice level institution) on giving outsiders access to information on Lilly's internal operations. Responsible Care required significant changes in a major policy and the affected internal managers had little voice in this. Further, the policy-skeptics viewed the Code as fundamentally redefining the relationship between their firm and communities living in the vicinity of its facilities, and they felt threatened by this redefinition.

Both Lilly and Baxter have adopted a wait-and-see stance on ISO 14000 (Chapter 7). Unlike Lilly's experience with Responsible Care, I foresee little organizational challenges to the implementation of ISO 14000. This is because these firms have already established most of the internal collective-choice level institutions required for ISO 14000: Lilly under Responsible Care and Baxter under the state-of-the-art standards. These firms have also proactively identified the operational-choice level changes required for implementing ISO 14000 (Appendix 10.1). As discussed above, operational-choice level changes do not significantly redistribute responsibilities and budgets. The main impediment for adopting ISO 14000 is the high cost of getting certification. Once such costs come down, I expect both

these firms to get the ISO 14000 certification.²²³

This discussion has important implications for policy design: policymakers should consider the impact of a proposed policy on organizational politics, and what incentives this may create for managers to support or oppose it. Policies that seek to draw upon firms' extant structures and institutions have greater likelihood of adoption and successful implementation. In contrast, if Type 2 policies require significant changes at the constitutional- and collective-choice levels, then they will probably encounter stiff internal opposition. And perhaps, such opposition may only be overcome by employing power-based processes.

Limitations of this Research

In this dissertation, I have employed a new-institutionalist perspective to examine environmental policymaking in Baxter and Lilly. However, these policy processes and inter-manager interactions could also be examined by employing other theories and frameworks such as resource-dependency (Pfeffer and Salancik, 1978; Wernfield, 1984), evolutionary (Nelson and Winter, 1982), institutional (Scott, 1987; Oliver, 1991), or ecology (Hannan and Freeman, 1977; Carroll, 1988). These theories and frameworks do not employ the same set of assumptions as new-institutionalism. In particular, since most of them do not subscribe to methodological individualism, they do not treat institutions (policies of firms) as conscious artifacts that can be traced to the preferences of individual actors. These theories

²²³ The initial estimate is \$20,000 per facility. For a firm with 100 facilities, this will amount to about \$2 million. On the positive side, innovative ways (such as combining ISO 9000 and ISO 14000 audits) are being considered to bring down such costs. Baxter is also considering combining the state-of-the-art and ISO 14000 audits.

and frameworks would therefore suggest different explanations for why firms selectively adopt Type 2 policies. Hence, this dissertation should be viewed as a modest attempt to examine the phenomenon of corporate environmentalism by employing one of many possible perspectives.

I have focused on Type 2 policies since they appear anomalous to neoclassical theory and efficiency-based theories within the new-institutionalist tradition. My findings and conclusions are therefore not generalizable to all beyond-compliance policies (Type 2 and Type 1). On this count, my dissertation should not be interpreted as a general critique of efficiency-based theories of firms.

In most of the cases examined in this dissertation, an efficiency-based logic does not hold. Eight of the ten cases represent successful adoption of Type 2 policies. Only two of my ten cases (ISO 14000 in Baxter and Lilly) represent non-adoption of Type 2 policy, and therefore an affirmation of an efficiency-based logic. Further, I have not studied why Lilly does not market green products (though in Chapter 10, I have discussed its rationale) or why Lilly does not invite external auditors. To the best of my knowledge, such policies have never been seriously discussed in Lilly, and there were no policy-supporters advocating the adoption of such policies. Nevertheless, these two unexamined cases (green products and external audits in Lilly) also represent an affirmation of efficiency-based logic.

Previously, I have discussed the need to demythologize the adoption of beyond-compliance policies. First, they can only be understood only in the context of extant laws and regulations, and the incentives for preempting more stringent laws or shaping future laws. Thus, adoption of Type 2 policies is a self-interested response by managers and their

firms. Further, beyond-compliance policies are adopted in other areas as well such as workplace safety and consumer safety. Beyond-compliance could also be viewed as a system-over design issue that is fairly common in technological and engineering issues. It would therefore be instructive to compare beyond-compliance policies making across issue areas within a given firm and examine the validity of the framework of analysis presented in this dissertation.

In this dissertation, I have focused only on policy-adoption only. I have not examined the durability and efficacy of power-based policies versus leadership policies. It could be argued that power-based policies may be effective in the short-run but not in the long-run. Only a consensual route of policy-adoption can succeed in the long-run given that skeptics often have ways to oppose, and if driven to desperation, even to sabotage it. On the other hand, it could be argued, that if top management's intent is clearly communicated, and power-based policies are able to meet their stated objective, then the skeptics may reconcile to new rules of the game. Thus, there are theoretical reasons to argue in favor as well as against power-based policies in the context of their long-run durability and efficacy. However, this is an important issue worthy of more research.

In examining inter-manager interactions, I have classified managers into two categories: policy-supporters and policy-skeptics. Somewhat in the tradition of Samuelson's (1947) 'revealed preference,' I have inferred managerial preferences for Type 2 policies from their behaviors. Methodologically, however, this is an imperfect way of assessing preferences since preferences and exhibited behaviors may not have direct correspondence; incentives are potential intervening variables. In other words, the same set of preferences can

translate into different behaviors given varying incentives.²²⁴ In some instances, actors may not have opportunities to express their preferences or may choose not to do so due to fears of retribution.

I have endeavored to guard against such pitfalls by examining the reasons why managers support or oppose a given policy. As discussed in Chapter 2, most of the managers working on environmental issues (and often supporting Type 2 policies) exhibit and articulate strong pro-environment views. They all had chosen to work on environmental issues; there were few organizational-level incentives influencing such decisions. Further, both in Baxter and Lilly, I did not find evidence suggesting that managers felt constraints to express their views on environmental issues due to fear of reprisal. Nevertheless, I do acknowledge that my strategy of inferring preferences from behaviors is not methodologically perfect.

I have suggested that if Type 2 policies do get adopted then it is through power- or leadership-based processes. It could be argued that what I have termed as leadership-based processes are in fact power-based processes where power is being exercised subtly in terms of shaping opinion.²²⁵ For example, it could be argued that efforts of policy-supporters such as having their firm's Washington lobbyists make presentations on the desirability of adopting Type 2 policies (as in Underground Tanks) are really strategies to manipulate opinions of the skeptics. In this context, it would be contended that power is being subtly

²²⁴ Though in the dynamics sense, behaviors may feed back into preferences, and actors may then modify their preferences accordingly.

²²⁵ This is similar to Carr's ([1934] 1946) notion of power over opinion. Scholars following the perspectives of Gramsci (1988) and Foucault (1967) could also be expected to argue along the same lines.

exercised.

If power is defined in such an all-encompassing manner, then it becomes impossible to make falsifiable predictions about whether or not power has been exercised. I have defined the outcomes of power-based processes in a specific way: preferences and exhibited behaviors of policy-skeptics do not change. If the ability to influence preferences (as in leadership-based processes) represents an exercise of power, then leadership is indeed a manifestation of power. I, however, have chosen not to define power in this manner.

I submit that power- and leadership-based processes are indeed different for the following reasons. First, as discussed earlier in this chapter, in power-based processes, the evidence of dissent is very clear. Such continued opposition of policy-skeptics became even more evident during interviews. Once I had won their confidence, especially in terms of protecting confidentiality, I came across a wealth of information on their continued negative perceptions about Type 2 policies. It then becomes easier for me to separate the instances where preferences had changed due to induced cooperation from where preferences had not changed at all. Further, in both these firms, most managers are fairly independent and outspoken; if they disagree then they speak out. Such public displays of disagreements have become even more pronounced since both of these firms are attempting to decentralize and to empower their division- and facility-level managers.

I have suggested that power- and leadership-based explanations together help us to understand why firms selectively adopt Type 2 policies. It could, however, be argued that senior managers first employ a leadership-route, and if it does not work out, then they resort to power-based processes. Hence, power- and leadership-based processes are sequential. I

disagree with this as well. When policy-supporters in Baxter decided to invite external auditors to define and then audit facilities against the-state-of-the-art standards, they adopted a power-based route: Vernon Loucks and Marshall Abbey mandated its implementation. Why was a leadership-based route not adopted? The reason is that since the policy-supporters had committed a very tight implementation schedule to the Environmental Review Board, they did not want to experiment with a potentially time consuming consensual route. As a result, they opted for employing the power of top-management fiat. This suggests that the strategy employed by policy-supporters are not sequential; it depends on a variety of factors such as the time-table for implementation, the level of perceived opposition, and the perceived success of employing fiat.

In this dissertation I have operationalized procedural efficiency in terms of the most well-accepted and widely used procedure of investment analysis -- capital-budgeting-- employed by large U.S.-based firms. I have not considered alternative routes to operationalize efficiency. Capital-budgeting is a procedure to maximize shareholder's wealth, an important objective geared for minimizing principal-agent conflicts in large corporations where principals (shareholders) do not have a direct say in the running of the firm, and are hence vulnerable to agent (managers) abuse. However, in owner-managed businesses where such principal-agent conflicts are not significant, capital-budgeting may not be employed. We could also probably not identify any other procedure consistently employed by owner-managers to *ex ante* estimate profitability of projects. Nevertheless, this does not imply that such businesses are inefficient. Thus, the findings and conclusions of this dissertation are applicable only to large corporations that employ capital-budgeting as an

established tool for investment analysis.

Further, since national systems of industrial organizations differ, it is conceivable that capital-budgeting may not be a widely accepted tool in say Japanese *Keiretsu* system of industrial organization.²²⁶ In fact, capital-budgeting may not be well-established in Japan given that most Japanese firms are over-capitalized by U.S. standards, an outcome that would be discouraged by capital-budgeting procedures. It is also suggested that Japanese managers have long time horizons, while capital-budgeting encourages shorter time horizons. Further, since Japanese managers are perceived as being relatively insulated from the pressures of the stock markets, it is suggested that they would not be unduly worried about ensuring adequate rates of return on investment. Hence, capital-budgeting may be inadequate, if not the wrong route, to operationalize efficiency in the Japanese or other non-U.S. systems of industrial organizations. On this count, my findings and conclusions may lack generalizability to non-U.S. contexts.

As discussed in Chapter 1, the 1993 UNCTAD benchmark survey suggests that environmental programs of MNCs are critically influenced by three factors: sales volume, nationality of their parent firm, and industry type. Baxter and Lilly share these characteristics

²²⁶ Kester notes that:

Japanese corporate governance emphasizes the reduction in transaction costs associated with self-interested opportunism and investment in relations-specific asset. This strategy fosters the building of stable, long-term commercial relationships among transacting companies, *although general (i.e., noncorporate, nonlending) shareholders are often forced to bear potentially substantial agency costs.* Anglo-American corporate governance, in contrast, emphasizes the reduction in agency costs associated with the separation of ownership from control, relying more heavily on formal, legalistic mechanisms to order commercial relationships among transacting parties (1996: 108; italics mine).

in that both have sales greater than \$4.9 billion, both have American parents, and both are in similar industries. On this count, the implication of this research for theory development and policymaking may not be generalizable to firms that vary on one or more of these three attributes: sales are less than \$4.9 billion, have non-American parents, or are in some other industry. Consequently, as a part of my long-term agenda, I plan to investigate the implications of this research by studying firms that vary on these three attributes.

Lastly, as with any research that employs a case study approach, and has a small sample size, the findings and conclusions of my dissertation are tentative. I have attempted to overcome the *small-n* problem by employing process-tracing.²²⁷ However, to have a greater confidence in the findings and conclusions, I need to validate and refine them by examining a *larger n*, a project that I look forward to pursuing in my post-doctoral work.

²²⁷ Since every stage in policy evolution constitutes an observation, any research employing process-tracing actually has large number of observations. King et al. note that in process-tracing:

[I]nstead of treating the ultimate outcome ... as the dependent variable, new dependent variables are constructed; for instance, each decision in a sequence, or each set of measurable perceptions by decision-makers or others; actions and intentions become the new variable. This approach often reaches the level of the individual actor. A particular theory that links initial conditions to outcomes will often imply a particular set of motivations or perceptions on the part of these actors This procedure may mean interviewing actors or reading their written record as the reasons for their action [P]rocess tracing and other approaches to the elaboration of causal mechanism increase the number of theoretically relevant observations [S]uch a method can help to overcome the dilemmas of small-*n* research (1994: 227; italics in original).

Table 10.1
Findings

	<i>Baxter</i>	<i>Lilly</i>
Underground Tanks	Adopted: Leadership	Adopted: Leadership
EPA's 33/50	Adopted: Leadership	Adopted: Leadership
Responsible Care	n.a.	Initially not adopted: Power Finally adopted: Leadership
ISO 14000	Not adopted: Efficiency	Not adopted: Efficiency
Internal Audits External Audits	Adopted: Power Adopted: Power	Adopted: Leadership Not adopted: Efficiency
Green Products	Adopted: Leadership	n.a.

Table 10.2
External Factors

Baxter

<i>Policy</i>	<i>Outcome/ Process</i>	<i>Importance of External Factors</i>
Underground Tanks	Adopted: Leadership	High; positive
EPA's 33/50	Adopted : Leadership	High; positive
Responsible Care	n.a.	n.a.
ISO 14000	Not adopted: Efficiency	Low; positive
Internal Audits External Audits	Adopted: Power Adopted: Power	High; negative High; negative
Green Products	Adopted: Leadership	High; positive

Lilly

<i>Policy</i>	<i>Outcome/Process</i>	<i>Importance of the External Factors</i>
Underground Tanks	Adopted: Leadership	High; positive
EPA's 33/50	Adopted: Leadership	High; positive
Responsible Care	Initially not adopted: Power; Finally adopted: Leadership	High; positive
ISO 14000	Not adopted: Efficiency	Low; positive
Internal Audits External Audits	Adopted: Leadership Not adopted: Efficiency	High; negative High; negative
Green Products	n.a.	

Table 10.2 contd.
External Factors

Summary

	<i>Adopted</i>	<i>Not adopted</i>
<i>High and positive</i>	Underground Tanks (Baxter, Lilly) 33/50 (Baxter, Lilly) Responsible Care (Lilly) Green products (Baxter)	Responsible Care (Lilly)
<i>High and Negative</i>	Internal Audits (Baxter, Lilly) External Audits (Baxter)	External audits (Lilly)
<i>Low and Positive</i>		ISO 14000 (Baxter, Lilly)

**Table 10.3
Organizational Change**

Baxter

	<i>Outcome/Process</i>	<i>Organizational Change</i>
Underground Tanks	Adopted: Leadership	Low
EPA's 33/50	Adopted: Leadership	Low
Responsible Care	n.a.	n.a.
ISO 14000	Not adopted: Efficiency	Low
Internal Audits External Audits	Adopted: Power Adopted: Power	High High
Green Products	Adopted: Leadership	Low

Lilly

	<i>Outcome/Process</i>	<i>Organizational Change</i>
Underground Tanks	Adopted: Leadership	Low
EPA's 33/50	Adopted: Leadership	Low
Responsible Care	Initially not adopted: Power; Finally adopted: Leadership	High Low
ISO 14000	Not adopted: Efficiency	Low
Internal Audits External Audits	Adopted: Leadership Not adopted: Efficiency	Low High
Green Products	n.a.	n.a.

**Table 10.3 contd.
Organizational Change**

Summary

	<i>Organizational changes are significant</i>	<i>Organizational changes are not significant</i>
<i>Policy is not adopted</i>	External Audits (Lilly) Responsible Care (Lilly)	ISO 14000 (Baxter, Lilly)
<i>Policy is adopted by power-based processes</i>	Internal and External Audits (Baxter)	
<i>Policy is adopted by leadership-based processes</i>	Internal Audits (Lilly) Responsible Care (Lilly)	Underground tanks (Baxter, Lilly) 33/50 (Baxter, Lilly) Green Products (Baxter)

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Appendix 1.1 Key U.S. Environmental Initiatives

<i>Year</i>	<i>Event</i>	<i>Objectives/Highlights</i>
1970	National Environmental Policy Act (NEPA)	Created Council on Environmental Quality to oversee quality of the environment
1970	Environmental Protection Agency (EPA) established	Nodal agency to implement new environmental laws
1970	Clean Air Act	Established national air quality standards and timetables for reaching them
1972	Water Pollution Control Act	Established national goals and timetables for clean waterways
1972	Pesticide Act	Required registration of and restrictions on pesticide use
1973	Endangered Species Act	Protected species of animals and plants whose survival was threatened
1974	Safe Drinking Water Act	Authorized national standards for drinking water
1976	Hazardous Materials Transport Act	Regulated shipments of hazardous materials
1976	Resource Conservation and Recovery Act (RCRA)	Regulated hazardous materials for production to disposal
1977	Toxic Substances Control Act	Established national policy to regulate, restrict, and if necessary, ban toxic chemicals
1980	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)	Established superfund and procedures to clean up hazardous waste sites; strict, joint, and several liability; criminal penalties for violators
1984	Hazardous Solid Wastes Amendments (HSWA) to RCRA	Regulated underground storage tanks
1986	Superfund Amendments and Authorization (SARA) to CERCLA	Increased funding for cleanups from \$1.6 billion under CERCLA to \$9 billion
1986	Emergency Planning and Community Right-to-Know Act (EPCRA) as Title III to SARA	To avoid Bhopal-type tragedies, firms required to establish systems for emergency response to toxic releases
1987	Clean Water Act Amendment	Authorized funds for sewage treatment plants and waterways
1988	Consequent to EPCRA, Toxic Release Inventory (TRI) Database created	Firms required to report on their annual releases of chemicals specified under Section 313 of EPCRA; First TRI report for calendar year 1987 to be filed by July 1, 1988

1989	Chemical Manufacturers Association	Responsible Care launched
1990	Clean Air Act Amendments	Required cuts in urban smog, acid rain, greenhouse gas emissions; promoted alternative fuels
1990	Pollution Prevention Act	EPA asked to provide guidelines, training, and incentives to prevent or reduce pollution at source through a multi-media strategy
1991	33/50 program	Consequent to PPA and to consolidate the gains of EPCRA, the EPA launches 33/50 program focussing on voluntary reductions in releases of 17 toxic chemicals

Appendix 1.2
Pollution-Control Costs for the U.S.
(In \$ billion)

	<i>1972</i>	<i>1975</i>	<i>1980</i>	<i>1985</i>	<i>1990</i>
Total	31.0	43.1	67.7	86.6	117.1
% GNP	0.9	1.2	1.6	1.8	2.1

Source: Carlin (1990: 16)

Appendix 2.1 Syllabi of Leading Business Schools

Stanford

<http://www-gsb.stanford.edu/academics/catalog/mbareq.html#F220>

F220. Finance This course covers the foundations of corporate finance and uses these foundations to analyze many of the important financial decisions made within firms and other institutions. Some of the topics covered include the valuation of fixed-income securities and stocks, capital budgeting and the choice of investment projects, the optimal capital structure of the firm and how it is affected by taxes, the notion of market efficiency, the valuation of options and other derivative securities and the use of these securities in corporate finance. [Course Listings](#)

Appendix 2.1 contd

Kellogg

<http://kisnt8.kellogg.nwu.edu/websss/scriptsk/catdtl.idc?>

COURSE : Finance I

Description This course studies the effects of time and uncertainty on decision making. Topics include basic discounting techniques, stock and bond valuation, capital budgeting under certainty and uncertainty, asset pricing models, and efficient markets.

Default Term none

Default Units 1.0 CREDIT

This course is not repeatable.

Prerequisites Course:0182-D34-0 Min. Grade:D OR Course:0182-D37-0 Min. Grade:D

Corequisites none

Appendix 2.1 contd

Duke

http://registrar.duke.edu/ACES/course_descrip/BA/351.html

BA 351

BA 351: Corporate Finance.

Description: Examines the implications of modern financial theory for various decisions faced by corporate financial officers. The concept of NPV, suitably adjusted to account for taxes, uncertainty, and strategic concerns, is used to analyze how investment and financing decisions interact to affect firm value. Topics include capital budgeting, capital structure, the cost of capital, mergers and acquisitions, and international financial management. Theory, empirical evidence, and case analysis all play significant roles in the course. Theory and empirical evidence together yield implications for corporate financial decision making. Case analysis forces students to apply their knowledge of theory and evidence to real-world situations.

Appendix 2.1 contd

Harvard

<http://www.hbs.edu/mba/program/req>

Finance

How does a company ensure that it has enough money to operate and grow? How do you make sound investment and financing decisions? This course examines the role of finance in the firm, and the marketing, production, and other functional areas of the firm, while also examining the role of the diverse participants in capital markets.

Through case studies, lectures, and readings, students learn the basic concepts of implementing financial strategy. As the course progresses, new knowledge is added to a more sophisticated framework of financial understanding. Students develop skills in financial analysis, such as:

- Capital budgeting
- Pro forma statements
- Ratio analysis
- Discounted cash flow valuation
- Risk analysis

The course also addresses sources and forms of external financing, as well as the role of financial markets.

Appendix 2.1 contd

Wharton

<http://www.wharton.upenn.edu/wemba/courses.html#corc>

FNCE 601

Financial Analysis

An introduction to corporate financial management and investments. Provides a framework, concepts, and tools for analyzing financial decisions based on fundamental principles of modern financial theory. Covers discounted cash flow techniques, corporate capital budgeting and valuation, investment decisions under uncertainty, options and market efficiency, and corporate financial policy.

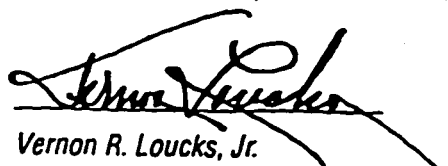
Appendix 3.1 Baxter's Environmental Policy

Baxter's Environmental Policy

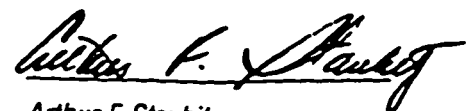
Baxter's Environmental Policy was adopted in 1990. The policy is applicable to Baxter's operations worldwide.

1. ***Environmental Review Board.*** An Environmental Review Board (ERB) appointed by the Public Policy Committee of the Board of Directors of Baxter is responsible for overseeing implementation of environmental policy. The ERB will review and decide matters of environmental importance and will make an annual report to the Board of Directors.
2. ***Legal Compliance.*** Baxter will comply with all applicable environmental laws.
3. ***Risk Control.*** Baxter will not create unacceptable risks to the environment and will minimize risk to the company from previous, existing, and potential environmental conditions.
4. ***Waste Minimization.*** Baxter will aggressively pursue opportunities to minimize the quantity and degree of hazard of the waste that results from its operations. It will reduce toxic and chlorofluorocarbon air emissions 60 percent by 1992 and 80 percent by 1996, from 1988 levels based on equivalent production.
5. ***Environmental Leadership.*** Baxter will work to become a leader in respect for the environment. It will establish and maintain an environmental program to be considered state-of-art among the Fortune 500 companies. Baxter will accomplish this goal by 1993 in the United States, Puerto Rico, and Canada, and by 1996 worldwide.
6. ***Environmental Coordinators and Managers.*** The manager of each manufacturing and distribution facility, and other division and group managers where appropriate, will appoint a qualified environmental representative to coordinate and manage the unit's environmental program. However, compliance with this Policy is not just the responsibility of these representatives; it is the responsibility of every employee and particularly every manager.
7. ***Training and Audit.*** Corporate environmental personnel, divisions, and facilities will provide coordinated, effective environmental training, awareness and audit programs as appropriate.
8. ***Unit Manager Responsibility.*** The manager of each unit of the company will assure that the following are accomplished by the unit wherever relevant:
 - 8-1 Determine the facts regarding generation and release of pollutants from its facilities and responsibly manage its affairs to minimize any adverse environmental impact.
 - 8-2 Develop and implement its own environmental management program to comply with this Policy.
 - 8-3 Select, design, build, and operate products, processes, and facilities in order to minimize the generation and discharge of waste and other adverse impacts on the environment.
 - 8-4 Utilize control and recycling technology wherever scientifically and economically feasible to minimize the adverse impact on the environment.

For more details on the implementation of these policies, see Baxter's Environmental Manual.



Vernon R. Loucks, Jr.
Chairman of the Board
and Chief Executive Officer



Arthur F. Staubit
Senior Vice President, Secretary,
General Counsel and
Chairman of the Environmental
Review Board

Appendix 3.2 Baxter's Environmental Financial Statement

BAXTER ENVIRONMENTAL FINANCIAL STATEMENT 1993 — 1995

ESTIMATED ENVIRONMENTAL COSTS AND SAVINGS WORLDWIDE (\$ IN MILLIONS)			
ENVIRONMENTAL COSTS			
COSTS OF BASIC PROGRAM	1995	1994	1993
Corporate Environmental Affairs and Shared Multidivisional Costs	1.5	1.4	1.6
Auditors' and Attorneys' Fees	0.4	0.6	0.3
Corporate Environmental Engineering/Facilities Engineering	0.7	0.8	0.9
Division/Regional Facility Environmental Professionals and Programs	7.0	7.0	6.5
Packaging Professionals and Programs for Packaging Reductions	2.8	2.1	2.0
Pollution Controls - Operations and Maintenance*	5.0	4.7	4.0
Pollution Controls - Depreciation	1.9	2.5	2.7
TOTAL COSTS OF BASIC PROGRAM	19.3	19.1	18.0
REMEDIATION, WASTE AND OTHER RESPONSE COSTS (Proactive environmental action will minimize these costs)			
Attorneys' Fees for Cleanup Claims, NOVs	0.4	0.3	0.2
Waste Disposal	3.2	2.8	3.4
Environmental Taxes for Packaging	0.3	0	0
Remediation/Cleanup - On-site	1.0	1.2	0.8
Remediation/Cleanup - Off-site	1.0	1.1	0.3
TOTAL REMEDIATION, WASTE AND OTHER RESPONSE COSTS	5.9	5.4	4.7
TOTAL ENVIRONMENTAL COSTS	25.2	24.5	22.7
ENVIRONMENTAL SAVINGS (Includes income, savings and cost avoidance) (See page 42 for detail on 1995 activities)			
Ozone-Depleting Substances Cost Reductions	0.5	1.8	1.2
Hazardous Waste - Disposal Cost Reductions	0.6	0.8*	0.6
Hazardous Waste - Material Cost Reductions	0.6	0.4*	0.4*
Nonhazardous Waste - Disposal Cost Reductions	0.4	0.5	0.5
Nonhazardous Waste - Material Cost Reductions	0.2	5.2*	1.1*
Recycling Income	5.9	3.5	2.7
Green Lights Energy Conservation - Cost Savings	0.4	0.3	1.1
Packaging Cost Reductions	6.6	7.2	7.2
TOTAL INCOME, SAVINGS AND COST AVOIDANCE FOR REPORT YEAR INITIATIVES	15.2	19.7*	14.8*
- As A Percentage of The Costs of Basic Program	79%	103%*	82%*
TOTAL INCOME, SAVINGS AND COST AVOIDANCE FROM REPORT YEAR INITIATIVES	15.2	19.7	14.8
COST AVOIDANCE IN REPORT YEAR FROM EFFORTS INITIATED IN PRIOR YEARS BACK TO 1989	72.2	65.8	52.2
TOTAL INCOME, SAVINGS AND COST AVOIDANCE IN REPORT YEAR	87.4	85.5	67.0

*These amounts are slightly different than reported in previous years because our reporting for these years has been re-evaluated and adjusted.

Appendix 3.3 **Lilly's Environmental Policy and Guidelines**

ENVIRONMENTAL POLICY

Eli Lilly and Company's mission is to create and deliver superior health care solutions in order to provide customers around the world with optimal clinical and economic outcomes. This mission requires that the company operate all of its facilities worldwide in a manner that protects human health and the environment.

ENVIRONMENTAL GUIDELINES

Eli Lilly and Company intends to carry out its environmental policy with a spirit of continuous improvement in the following ways:

- The company will design, construct, and operate its facilities in a manner that protects human health and minimizes the impact of its operations on the environment.
- The company will encourage and expect each employee to be environmentally responsible.
- The company will provide ongoing education and training to Lilly employees so that they will be prepared to deal with day-to-day environmental responsibilities as well as environmental emergencies.
- The company will comply with or exceed all applicable laws and regulations. Where existing laws and regulations are not adequate, the company will adopt its own environmental quality standards.
- The company will make environmental considerations a priority throughout the process of developing new products.
- The company will encourage and promote waste minimization, the sustainable use of natural resources, recycling, energy efficiency, resource conservation, and resource recovery.
- The company will communicate its commitment to environmental quality to Lilly employees, shareholders, vendors, customers, and the communities in which it operates.
- The company will recognize and respond to the community's questions about its operations.
- The company will actively participate with government agencies and other appropriate groups to ensure that the development and implementation of environmental policies, laws, regulations, and practices serve the public interest and are based on sound scientific judgment.
- The company will regularly assess and report to management and the Board of Directors on the status of its compliance with this policy and with environmental laws and regulations.

Appendix 4.1 Lilly's Underground Storage Tanks

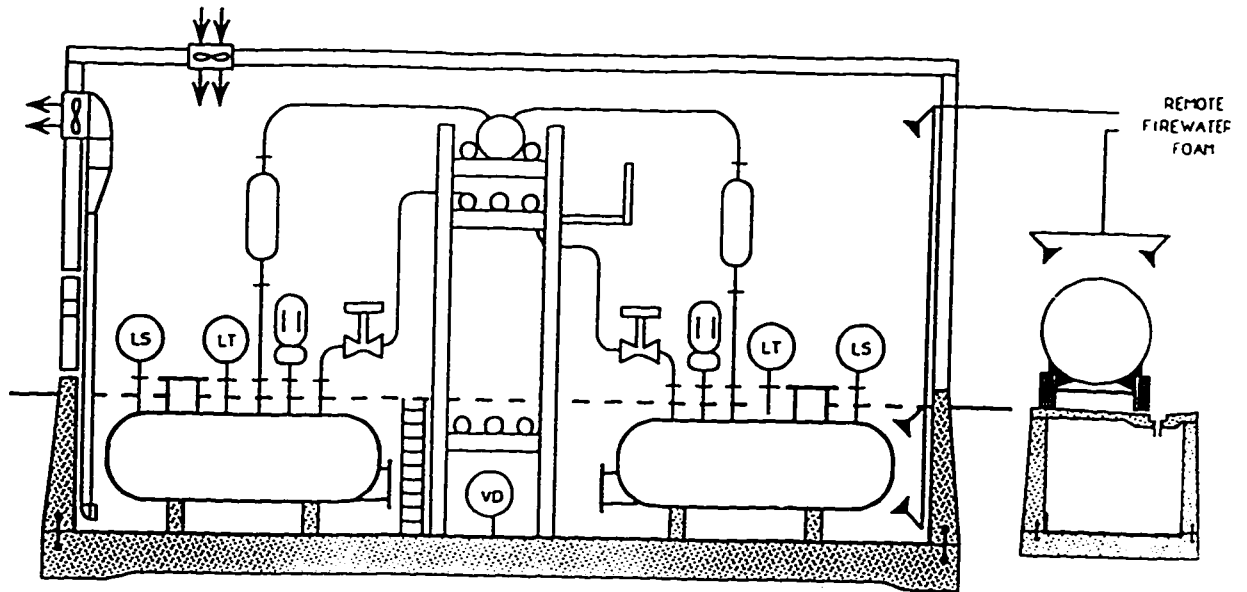
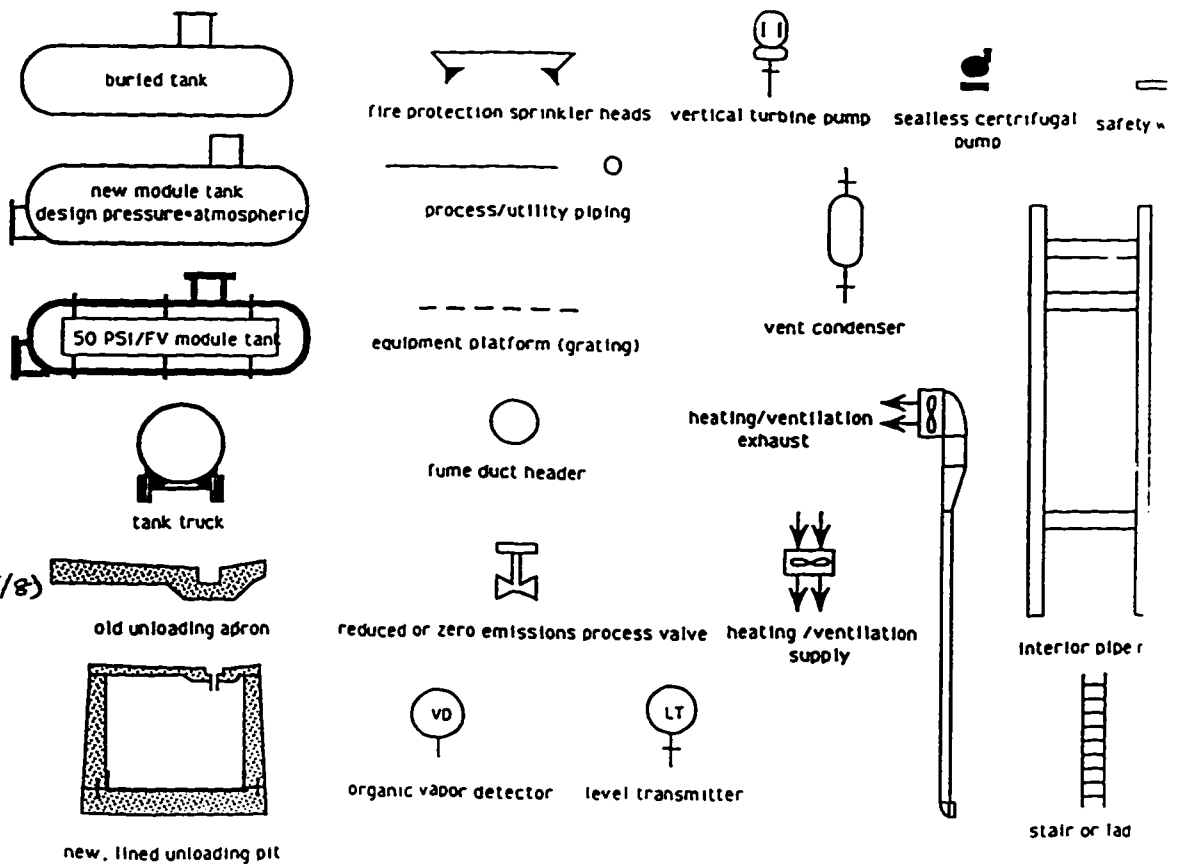


Figure 2 Simplified composite view of tank module building (elevation view)



Source:
Vangeloff (1992: 5/8)

Appendix 5.1
Press Clippings on Baxter's Environmental Performance

Article in Tulsa Newspaper on 24 April 1990

Toxic honors set

OKLAHOMA CITY — The National Toxics Campaign will honor nine Oklahoma companies or factories that have voluntarily reduced emissions of ozone-destroying chemicals.

The companies will be honored Wednesday at a State Capitol gathering.

The firms include McDonnell Douglas, Baxter Pharmaseal Division and Thomas and Betts Co., all of Tulsa, AT&T Network Systems and York International, both of Oklahoma City, Owens-Brockway of Ada, Weyerhaeuser of Valliant and Halliburton Services facilities in Duncan and Davis.

Last July, those and other Oklahoma companies were asked by the environmental group to reduce emission of ozone-depleting chemicals, such as methyl chloroform and Freon.

257

GK

Bentley Labs listed among top 20 firms in emissions report

^{w 3569}
Bentley Laboratories of Irvine was one of the top 20 firms in the nation emitting ozone-damaging chemicals in 1987, according to the Natural Resources Defense Council.

Figures provided by Bentley indicate that in 1987, the medical device manufacturer dumped 706,971 pounds of ozone-damaging chemicals into the air.

A recently released report by the Natural Resources Defense Council listing the 3,000 U. S. firms emitting ozone-eating substances stated that Bentley released the 19th largest amount.

But as a result of \$200,000 in pollution control devices installed over the past two years, a spokesman for the firm said, Bentley has reduced

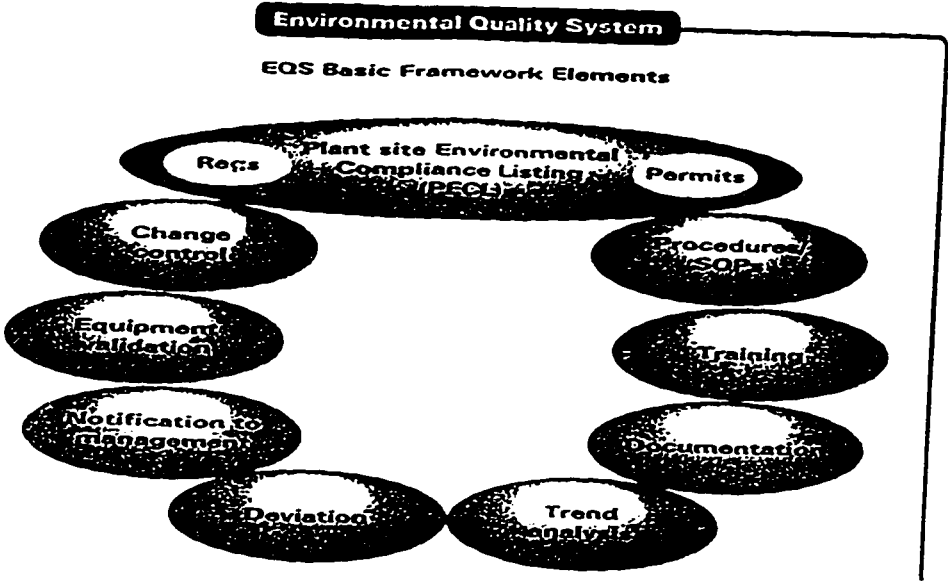
its emissions of freon and trichloroethane—both said to destroy ozone—to 462,500 pounds in 1989.

Bentley was also one of 1,500 manufacturers named in a June report by the NRDC as the "Who's Who of American Toxic Air Polluters." Bentley made the list because of its emissions of the suspected carcinogens ethylene oxide and methylene chloride, which totaled 92,000 pounds in 1987.

That figure, too, has dropped to 22,500 pounds in 1989, the company spokesman said, reflecting a 75 percent drop.

The figures on plant emissions were reported by Bentley under the 1986 federal "community right-to-know" act, an amendment to the Superfund law.

Appendix 7.1
Lilly's Environmental Quality System



Source: Lilly (1995: 8)

Appendix 7.2 Baxter's Environmental Awards

1991

BAKTER

Lake County Youth Conservation Corps
Community, Careers, Conservation Award

CAROLINA, PUERTO RICO

Puerto Rico Solid Waste Management Authority
Recycling Program Award

CAROLINA, PUERTO RICO

Puerto Rico Aqueduct and Sewer Authority
Water Quality Award

CARTAGO, COSTA RICA

Ministry of Industries of Costa Rica and the
Municipality of San José
Environmental Conservation Award

CARTAGO, COSTA RICA

Ministry of Natural Resources, Environmental Flag

CASTLEBAR/SWINFORD, IRELAND

Minister for Environmental Protection, Ireland
Best Environmental Management Award

CASTLEBAR/SWINFORD, IRELAND

European Better Environment Awards
Commendation Award in the Good Environmental
Management Category for Industry

EL PASO, TEXAS

State of Texas Solid Waste Program Award

EL PASO, TEXAS

State of Texas Air Program Award

ENVISION™ RECYCLING PROGRAM

I.V. Systems Division
Society of Plastics Engineers
First Annual Award for Recycling

HAYWARD, CALIFORNIA

City of Hayward, Earth Day Award

HAYWARD, CALIFORNIA

CIWMB; Waste Reduction Award

IRVINE, CALIFORNIA (CVG)

City of Irvine; Environmental Excellence Award

IRVINE, CALIFORNIA (CVG)

CIWMB; Waste Reduction Award

IRVINE, CALIFORNIA (CVG)

National Awards Council for Environmental
Sustainability
Environmental Achievement Certificate

I.V. SYSTEMS

Illinois Environmental Protection Agency
Star Partner Award

JACKSONVILLE, TEXAS

Cherokee County; 1994 Waste Conservation Award

JOHNSON CITY, TENNESSEE

State of Tennessee; TRI Emission Reduction Award

JOHNSON CITY, TENNESSEE

State of Tennessee
Tennessee 2000 Air Program Award

MARICAO, PUERTO RICO

Puerto Rico Solid Waste Authority
Recycling Program Award

MEXICALI, MEXICO

Mexico; National Environmental Award

MIAMI, FLORIDA

Florida Environmental Expo
Environmental Program Award

MONCTON, CANADA

Greater Moncton Chamber of Commerce
Park Beautification Award

AWARDS CONTINUED

MOUNTAIN HOME, ARKANSAS

Arkansas Environmental Federation
Hazardous Waste Minimization Award

MOUNTAIN HOME, ARKANSAS

Arkansas Recycling Coalition
Corporate Recycler of the Year

NORTH COVE, NORTH CAROLINA

North Carolina Recycling Association Merit Award

OAKLAND, CALIFORNIA

CIWMB; Waste Reduction Award

ONTARIO, CALIFORNIA

CIWMB; Waste Reduction Award

POINTE CLAIRE, QUEBEC

West Island Chamber of Commerce (Montreal)
Award for Environmental Achievement

RIVERSIDE, CALIFORNIA

Riverside County; Recycling Award

THETFORD, ENGLAND

Beazer Homes; Environment Award

WINNIPEG, MANITOBA

Manitoba Round Table of Environment & Economy
Sustainable Development Award of Excellence

1995

AÑASCO, PUERTO RICO

Puerto Rico Solid Waste Management Authority
Recycling Award

BAKTER

Lake County Youth Conservation Corps
Community, Careers, Conservation Award

BAKTER

Illinois Parks and Recreation Association and Illinois
Association of Park Districts
Community Service Award for the Advancement of Parks

CARTAGO, COSTA RICA

Costa Rica Minister of Natural Resources,
Energy and Mines; Ecological Flag

CHIHUAHUA, MEXICO

SEDOSOL Mexico's Environmental Agency
National Ecological Award

EL PASO, TEXAS

State of Texas; Clean Texas 2000 Partner Award

EL PASO, TEXAS

Keep El Paso Beautiful; Environmental Award

EL PASO, TEXAS

Keep Texas Beautiful; Environmental Award

EL PASO, TEXAS

Keep America Beautiful; Environmental Award

HAYWARD CALIFORNIA

CIWMB; Waste Production Award

IRVINE, CALIFORNIA (CVG)

City of Irvine
Environmental Community Outreach Award

IRVINE, CALIFORNIA (CVG)

City of Irvine; Water Conservation Award

IRVINE, CALIFORNIA (CVG)

Mayor of Irvine; Waste Reduction Commendation

AWARDS CONTINUED

IRVINE, CALIFORNIA (CVG)

Mayor of Irvine
Environmental Community Outreach

IRVINE, CALIFORNIA (CVG)

Harbor, Parks and Beaches
Park Cleanup Recognition

IRVINE, CALIFORNIA (CVG)

California State Legislature, Environmental

IRVINE, CALIFORNIA (CVG)

U.S. Congressmen
Environmental Community Outreach

IRVINE, CALIFORNIA (CVG)

RENEW America; Environmental

IRVINE, CALIFORNIA (CVG)

CIWMB; Waste Reduction Award

JACKSONVILLE, TEXAS

State of Texas, Clean Texas 2000

JOHNSON CITY, TEXAS

Chamber of Commerce, Clean Texas

LOS ANGELES, CALIFORNIA

Catalina Harbor Clean up, Golden

MCGAW PARK, ILLINOIS (CVG)

Lake County Solid Waste Board
Award for Environmental Education

MCGAW PARK, ILLINOIS (CVG)

Lake County Solid Waste Board
Award for Environmental Education

MEXICALI, MEXICO

Mexico; National Environmental

MEXICALI, MEXICO

PROFEPA, Mexico's Environmental
Enforcement Agency
Green Flag National Environmental

MISSISSAUGA, ONTARIO

City of Mississauga
Best Environmental Program Award

MISSISSAUGA, ONTARIO

Region of Peel
Outstanding Industrial and Comm
Environmental Initiatives and Was

MOUNT PEARL, NEWFOUND

Government of Newfoundland; Env

MOUNTAIN HOME, ARKAN

State of Arkansas; Pollution Preve

REDMOND, WASHINGTON

Kane County; Green Award

VERIE SANDBORG

National Association for Environm
Certificate of Recognition

SUE SHAPIRO

Illinois Department of Natural Re
Volo Bog Volunteer Centurian Awa

CURTIS STEPHAN

National Association for Environm
Environmental Excellence Award

Appendix 10.1

Lilly's ISO 9000/ISO 14000/Lilly EMS/ Responsible Care Matrix

ISO 9001 Quality Standard	ISO 14001 Environmental Standard	Lilly EMS Element	Responsible Care Codes of Management Practice					
			CAER	Pollution Prevention	Process Safety	Distribution	Employee Health & Safety	Product Stewardship
4.1	4.1,4.3.1,4.5	EPPI-1.0,2.0,5.0	A5,A10	1,5,6	1,2		1	1,2,3
4.2	4.0,4.3,4.4,3.6	EPPI-2.0,3.0			7,18	4.1,4.2,4.3		
4.3	4.3.6	EPPI- 3.0,6.1,14.1,14.2						
4.4	4.3.6	EPPI-3.0,6.1						
4.5	4.3.5	EPPI-3.0,11.0,2.5					4,5	
4.6	4.3.6	EPPI-3.0,6.0,2.0		12	22	3.1,4.6	3	9,10
4.7	4.3.6	EPPI-3.0,14.1						
4.8								
4.9	4.3.6	EPPI- 7.1,14.1,2.4,2.0	B2	13	10,12,13,16,18	4.1,4.2,4.3	4,11,12	
4.10	4.4.1	EPPI-3.0,14.1,14.2						
4.11	4.4.1	EPPI-3.0,17.0,13.1, 13.2,2.0			14		13	
4.12								
4.13	4.4.2	EPPI-3.0,14.1,14.2						
4.14	4.4.2	EPPI-3.0,8.0,14.1, 14.2,6.1,7.1,2.0	B1	3	4,9	1.1,2.3	8,14	6
4.15	4.3.6	EPPI- 3.0,6.0,6.1,8.0, 9.0,18.0						
4.16	4.4.3	EPPI-3.0,14.1,10.0, 2.0			8			4,5
4.17	4.4.4	EPPI-14.1,2.0		2,7,11	3	2.4,3.2,4.7	5,6	2
4.18	4.3.2	EPPI-3.0,8.0,0.9,2.0	A2,A3,B3,B4		17,19,20	2.2,5.3	11,17,18	8
4.19	4.3.6	EPPI-3.0						
4.20		EPPI-3.0						
	4.2	Env Bus Process						
	4.2.1	EPPI-4.0,2.0		2,3,4,5,11	9,11	1.1,1.2		5,6,7
	4.2.2	EPPI-5.0,10.0,11.0						
	4.2.3	Env. Bus. Process, EPPI-2.0,3.0						
	4.2.4	EPPI-5.0, Env Bus. Process						
	4.3.3	EPPI- 4.0,10.C,13.1,2.0	A3,A4,A7,A8,A9, B2,B5,B6,B7,B9	1,4,8	1,4,5,6	2.3,3.2,4.5		11,12

Entries are either paragraph numbers or Management Practices
 EPPI - Environmental Policies, Procedures & Information Manual

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Education

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- 1986-1988 **M.B.A. (Post Graduate Diploma in Management)**
Indian Institute of Management, Ahmedabad, India
- 1983-1986 **B.A. (Honors) Economics**
St. Stephen's College, University of Delhi, India

Publications in Journals

- “Strategic Trade and Investment Policies: Implications for the Study of International Political Economy,” 1997, *The World Economy*, forthcoming (with Jeffrey A. Hart).
- “Green and Global,” 1997, *Indiana Journal of Global Legal Studies*, 4 (2): 575-591.
- “The Decline of ‘Embedded Liberalism’ and the Rearticulation of the Keynesian Welfare State,” 1997, *New Political Economy*, 2 (1): 65-78 (with Jeffrey A. Hart).
- “Multinational Corporations and International Environmental Policy,” 1996, *Business and the Contemporary World*, VIII (3/4): 119-144 (with Kerry Krutilla and Panagiotis Karamanos).
- “Regionalization and Globalization: Conceptual Issues and Reflections,” 1996, *International Trade Law and Regulation*, 2(6): 205-211 (with Jeffrey A. Hart).
- “Are Efficiency, Equity, and Scale Independent?” 1994, *Ecological Economics*, 10: 89-91 (with Anil K. Gupta).

Book Chapters

“The Rearticulated State in the Global Economy,” 1997, in *Globalization and the Politics of Resistance*, edited by Barry K. Gills with a Foreword by John Kenneth Galbraith, London: McMillan (with Jeffrey A. Hart).

“Ecologically Sustainable Institutions,” 1997, in *Environmental Sustainability*, edited by Fraser D. M. Smith, Florida: St. Lucie Press (with Anil K. Gupta).

Selected Working Papers

“The Afghanistan War and the Breakdown of the Soviet Union,” 1996, Discussion Paper # 123, Indiana Center for Global Business, Indiana University, Bloomington (with Rafael Reuveny).

“State and Statecraft in Kautilya's *Arthashastra*,” Working Paper # W94-3, 1994, Workshop in Political Theory and Policy Analysis, Indiana University, Bloomington.

“On Internalization of Externalities,” Working Paper # 1126, 1993, Indian Institute of Management, Ahmedabad, India (with Anil K. Gupta).

“Choosing the Right Mix: Market, State, and Institutions for Environmentally Sustainable Industrial Growth,” Working Paper # 1066, 1992, Indian Institute of Management, Ahmedabad, India (with Anil K. Gupta).

Book Review

Hempel, Lamont C., 1996, *Environmental Governance: The Global Challenge*, Washington D.C.: Island Press, in *OTHERWISE*, Vol. 2 (Fall): 12-14.

Conferences

“A Logic of Corporate Environmentalism,” presented at the Annual Conference of the International Studies Association, Toronto, Canada, March 18-22, 1997.

Chair, “Governance Structures in the Twenty First Century: Views from Different Perspectives -- II,” panel at the Annual Conference of the International Studies Association, San Diego, California, April 16-20, 1996.

“International Political Economics and Environmental Issues,” presented at the Annual Conference of the International Studies Association, Chicago, February 22-26, 1995.

Discussant, “World System Theory and Environment” panel at the Annual Conference of the International Studies Association, Chicago, February 22-26, 1995.

“Institutions and Environmental Sustainability: Reflections on Ecological Economics,” presented at the 3rd International Conference of the International Society of Ecological Economics, San Jose, Costa Rica, October 23-27, 1994 (with Anil K. Gupta).

Academic Awards

- 1996 **Summer Dissertation Fellowship (\$1,875)**
College of Arts and Sciences, Indiana University, Bloomington
- 1996 **Graduate Student Travel Award (\$150)**
College of Arts and Sciences, Indiana University, Bloomington
- 1995 **Dissertation Research Fellowship (\$5,000)**
Center for International Business Education and Research
Graduate School of Business, Indiana University, Bloomington
- 1993-94 **Doctoral Fellowship (\$18,000)**
Workshop in Political Theory and Policy Analysis
Indiana University, Bloomington
- 1986 **Arvind Gandotra Award** for "Excellence in Academics and Extra-Curricular Activities" St. Stephen's College, Delhi, India

Teaching Awards

- 1997 **Teaching Excellence Award (\$250)**
School of Public and Environmental Affairs, Indiana University,
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- 1996 Nominated for university-wide **Lieber Associate Instructor Award** for
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University Grants

- 1997 \$15,000 from Indiana Center for Global Change, Indiana
University, Bloomington for organizing a conference on
Coping With Globalization to be held in Washington D.C.,
July 1998 (with Jeffrey A. Hart).
- 1996 \$11,400 from Indiana University, Bloomington, and Purdue
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Economic Globalization, Multinational Corporations, and Public Policy (V 450/550)
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Fall 1996

Statistical Techniques (K 300)
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Work Experience

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Brand Assistant, Assistant Brand Manager, & Brand
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Ecological Economics
International Studies Quarterly